Schultz-Hanford Area Transmission Line Project

Final Environmental Impact Statement

Bonneville Power Administration
U.S. Department of Energy

Bureau of Land Management
Bureau of Reclamation
Fish and Wildlife Service
U.S. Department of Interior

Department of Army
U.S. Department of Defense

January 2003

Final Environmental Impact Statement

Responsible Agencies: U.S. Department of Energy, Bonneville Power Administration (BPA), Richland Operations Office (RL); U.S. Department of Defense, Department of Army (USDOA); U.S. Department of Interior, Bureau of Land Management (BLM), Bureau of Reclamation (BOR), Fish and Wildlife Service (USFWS).

Title of Proposed Project: Schultz-Hanford Area Transmission Line Project – DOE/EIS-0325

State Involved: Washington

Abstract: BPA proposes to construct a new 500-kilovolt (kV) transmission line in central Washington. This project would increase transmission system capacity north of Hanford. Since the mid 1990's, transmission lines in central Washington have grown increasingly constrained. During spring and early summer months, the amount of power that needs to move through this area exceeds the carrying capacity of the existing transmission lines. Not having enough transmission capacity can compromise safety and decrease transmission system reliability. Four construction alternatives, all involving construction of new transmission lines, and a No Action alternative are being considered. Each construction alternative begins at BPA's Schultz Substation approximately 9 miles north of Ellensburg, Washington. The alternatives terminate in northern Benton County at one of two locations, BPA's Hanford Substation or a new substation (Wautoma Substation) just east of the Benton REA Blackrock Substation. The Preferred Alternative (Alternative 2) is approximately 64 miles long. This alternative would terminate at the new Wautoma Substation. Most of the new line would parallel existing transmission lines with separation varying between 125 feet and 1375 feet. About 8 miles of the line would be a rebuild of the existing line to double-circuit to hold both the existing and new transmission line. This would reduce ROW impacts and the need for new access roads through agriculture. Alternative 1 is approximately 63 miles long and would terminate at Hanford Substation. This alternative would establish a new ROW in the vicinity of, but not directly adjacent to an existing ROW. There would be impacts to agricultural practices and rangeland. Alternative 3 is approximately 58 miles long and would terminate at the new Wautoma Substation. About 30 miles of the route would be a new ROW through the Yakima Training Center causing disruption to Army uses of land as well as impacts to shrub-steppe habitat and known cultural resource sites. Alternative 1A is approximately 70 miles long and ends at Hanford Substation. This alternative would establish about 14 miles of new ROW, with the remaining being in the vicinity of, but not directly adjacent to an existing ROW. There would be impacts to shrub-steppe habitat and rangeland. BPA is also considering a No Action Alternative (Environmentally Preferred). This alternative would not create any construction related environmental impacts and would not meet the purpose or need for the project.

The USDOA, BLM, BOR, and USFWS, as cooperating agencies, must select an alternative based on their needs and objectives, decide if the project complies with currently approved management plans/objectives, and decide if they would issue the appropriate permits/easements for the construction, operation, and maintenance of project facilities. The RL, while not a cooperating agency, would make joint decisions with BPA.

The comments received on the Draft EIS and responses to the comments are in Chapter 6.

The Final EIS looks much like the Draft EIS. Additions and changes are underlined. Deletions are not marked. Additional appendices have been added to respond to comments and clarify information. A listing of the general changes in each chapter is listed on the next page.

BPA expects to issue a Record of Decision (ROD) in February 2003. The ROD will be mailed to agencies, groups, and individuals on the mailing list.

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For more copies of this document, please call 1-800-622-4520 and ask for the document by name. The Summary is also available on the Internet at *www.efw.bpa.gov*. Click on *Environmental Planning/Analysis, Active Projects.*

For additional information on DOE NEPA activities, please contact Carol Borgstrom, Director, Office of NEPA oversight, EH-25, U.S. Department of Energy, 1000 Independence Avenue S.W., Washington D.C. 20585, phone: 1-800-472-2756.

Summary of Changes in the Final EIS

Chapter 1

Information has been updated.

Chapter 2

More detail has been included about the alternatives. Two route options are described for the Sickler-Shultz Reroute out of the Schultz Substation. An alternative was added to Alternative Eliminated from Detailed Consideration.

Chapter 3

Additional information regarding the fiber route to Columbia Substation was added. Sections were revised based on new field information, primarily wetlands and vegetation.

Chapter 4

Additional information regarding the fiber route to Columbia Substation was added. Impact information has been added, updated and corrected.

Chapter 5

BPA has updated and added information on permitting.

Chapter 6

This is a new chapter that contains the comments received on the DEIS and BPA's responses to the comments.

Chapter 7, 8, 9, 10 and 11

Corrections and additions have been made to these chapters.

Appendices

Appendices B, K and L are new to the FEIS. Many of the other Appendices have been updated.

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Summary

In this Summary:

- **Purpose and Need for Action**
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- **Affected Environment**
- **Impacts**

This summary covers the major points of the Final ***Environmental Impact Statement*** (***EIS***) prepared for the Schultz-Hanford Area Transmission Line Project proposed by the Bonneville Power Administration (***BPA***). The project involves constructing a new 500-kilovolt (***kV***) line in central Washington, north of Hanford. The new line would begin at the Schultz Substation near Ellensburg and and end at a new or existing substation in the Hanford area (see Map S-1). The project may also involve constructing a new substation to accommodate the new transmission line. As a federal agency, BPA is required by the National Environmental Policy Act (***NEPA***) to take into account potential environmental consequences of its proposal and take action to protect, restore, and enhance the environment during and after construction. Preparation of this EIS assists in meeting those requirements.

For Your Information

Words and acronyms in bold and italics are defined in Chapter 10, Glossary and Acronyms, in the Final EIS. Some are also defined in sidebars.

S.1 Purposes and Need for Action

S.1.1 Need

BPA owns and operates a system of transmission lines that move electricity through central Washington. Since the mid-1990's, the transmission lines that move electricity in a north-to-south direction on the east side of the Cascades, north of the U.S. Department of Energy Hanford Reservation (Hanford Site), have grown increasingly constrained. During spring and early summer months, the amount of power that needs to move through this area exceeds the carrying capacity of the existing transmission lines. Not having enough ***transmission capacity*** can compromise safety and decrease transmission ***system reliability***.

In the event of an ***outage***, additional power cannot be moved through the existing transmission system because the lines would overheat and sag below acceptable levels potentially causing fires and further equipment failure. This can lead to ***brownouts*** or, under certain conditions, a ***blackout***. Therefore, BPA needs to increase transmission capacity ***north of Hanford*** to move additional power through this area.

Transmission capacity *refers to the maximum load that a transmission line or network of transmission lines can carry.*

System reliability *is the ability of a power system to provide uninterrupted service.*

A transmission line that is not in service, either planned or unplanned, is called an ***outage****.*

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

A ***blackout*** *is the disconnection of the source of electricity from all electrical loads in a certain geographical area.*

S.1.2 BPA's Purposes

Purposes are goals to be achieved while meeting the need for the project. They are used to evaluate project alternatives. BPA will use the following purposes to choose among the alternatives:

- Maintain transmission system reliability;
- Optimize transmission system usage;
- Minimize environmental impacts;
- Minimize costs; and
- Meet ***energization date*** of late 2004.

For Your Information

By optimizing transmission system usage, congestion is relieved on constrained transmission paths, thereby delaying transmission reinforcement.

*The **energization date** is when the project has been built and is operational.*

In order to meet the requirements of the 2000 Biological Opinion, BPA needs to plan and construct a project in the Hanford area by 2004 or 2005.

Investments included cost-effective measures such as remedial action schemes; automatic measures like generation and/or load dropping that ensure acceptable transmission system performance.

***Regional power transfers** are the exchange of electricity between the Pacific Northwest and California or Canada when one region has a surplus of energy and demand is high in another.*

***Spring run-off** refers to water from the snow melting in the spring that adds to the amount of water flowing in the Columbia River.*

*In the process of **spilling** water, dam gates are opened and water flows out. The water does not go through the turbines, which could injure fish.*

S.1.3 Background

BPA has limited transmission capacity north of Hanford primarily because of two main reasons:

- Wholesale power deregulation; and
- Obligations to threatened and endangered species (fish).

Wholesale power deregulation started in 1992, causing BPA to cut costs in many ways in order to stay competitive in an open market. BPA had not built any major transmission lines since the mid-1980's, and this continued after deregulation. Investments in the transmission system (including maintenance) were small, inexpensive, and quickly energized compared to building expensive transmission lines. However, this allowed BPA to squeeze more performance out of the existing transmission system and continue to meet growing load. Over the past five years, there has been an increase in the usage of the transmission system due to an increase in ***regional power transfers***. The increased transmission usage in the Northwest has outrun the capacity of the existing transmission system.

Since the early 1990's, 12 distinct populations of salmon species have been listed as threatened or endangered under the Endangered Species Act (**ESA**) within the northwestern United States. Federal agencies that operate the dams in the Northwest are required to take specific actions to help salmon survive. During the ***spring run-off***, water in the Lower Snake and Columbia Rivers that had previously been used to generate electricity at dams (Lower Granite to Bonneville) is now used to help transport juvenile salmon down river to the ocean. ***Spilling*** water over these dams causes less water to go through the turbines which results in less power being generated. To make up for the loss of generation, dams along the mid- and upper-Columbia River in northern Washington (e.g., Grand Coulee and Chief Joe) need to generate additional power to meet market demands during the spring and summer months. This is in addition to power coming from Canada.

As electricity is generated at the mid- and upper-Columbia River dams, it moves south through central Washington to load centers like Portland and Seattle, and to the ***Southern Intertie***. It also flows west over the Cascade Mountains and then south through the Seattle area. The transmission capacity across the north of Hanford area cannot accommodate the amount of electricity needing to flow through the area to the south.

For Your Information

*The **Southern Intertie** is a collective group of transmission lines that move power north and south between Oregon and California.*

S.1.4 Draft EIS Public Comment Period

The Draft EIS (DEIS) was made available to the public on February 8, 2002. 251 copies of the DEIS were mailed to interested members of the public. 99 copies of the summary were also mailed. Comments were collected at public meetings held in Desert Aire, Ellensburg, and Richland, Washington. Comments were also received via phone, mail, and e-mail. The comment period ended on March 25, 2002.

This Summary and Final EIS (FEIS) provides updated information based on comments received as well as additional information that has become available. Additions to the document are displayed with underlined text.

S.2 Alternatives

After identifying existing and future electrical needs in the area, BPA began to develop alternatives to meet that need. BPA did long range 6-year studies to determine what actions could meet the need, what each would cost, and how each could affect the transmission system.

This ***Environmental Impact Statement (EIS)*** refines these actions or alternatives based on comments from agencies and the public. Several alternatives were evaluated. These alternatives – the Preferred Alternative (Alternative 2), and Alternatives 1, 3, and 1A – are discussed in this EIS, as well as the No Action Alternative.

S.2.1 Segments

The construction alternatives are divided into Segments A through F. All segments are ***single-circuit*** lines unless otherwise specified.

*A **single-circuit** line has one electrical circuit per structure.*

Segment A, common to all alternatives, starts at the BPA Schultz Substation and goes southeast, following the existing Vantage – Schultz 500-kV transmission line. In order to make room for the new line and improve the configuration of the existing lines, BPA would relocate the first mile of the existing Sickler-Schultz 500-kV

For Your Information

*A **bay** is an area set aside in a substation for special equipment.*

The decision of whether to use Option 1 or 2 of the Sickler-Schultz Reroute would depend on negotiations with the landowners.

Since the DEIS, BPA determined that the existing structures on the Schultz-Vantage line between the substation and Naneum Crossing would not be able to support the new conductor and would have to be replaced.

transmission line from its current location, to a new ***bay*** on the north side of the substation. This redesign is referred to as the Sickler-Schultz Reroute and has two options.

From the substation, the line would head northeast along one of two optional routes for approximately 1 mile to intersect with the existing Rocky Reach–Maple Valley 345-kV line. The two Sickler-Schultz Reroute options are approximately 1200 feet apart on the south side and converge to the same tower on the north. The second route option was developed in response to landowner concerns. Option 2 would result in the construction of one more tower than Option 1. From the tower where the two options converge, the line would follow the Rocky Reach–Maple Valley line for approximately 1.5 miles to the northeast. At this point, the relocated Sickler-Schultz line would reconnect with the existing Sickler-Schultz line and continue to the northeast.

The existing Schultz-Vantage 500-kV line from Schultz Substation to the Naneum Crossing would be rebuilt. The line would then be connected with the new transmission line running parallel to the existing Schultz-Vantage line to the southeast. The existing Schultz-Vantage line would be connected to the vacated portion of the Sickler-Schultz line running into the Schultz Substation. The portion of the Sickler-Schultz line that runs due north from the Naneum crossing would be removed because it would no longer be needed. This combination of rerouting and reconnecting lines would eliminate the existing 500-kV line crossings.

Southeast of Naneum crossing the new transmission line would be constructed roughly parallel to the existing Schultz-Vantage line. The new line would be located on the north side of the existing line starting with a 200-foot separation for approximately 6 miles and then a 400-foot separation for approximately 4 miles. The remaining 13 miles would have a variable separation ranging from 500 feet to 1,375 feet. Segment A would cross the Vantage Highway. Segment A is 27.5 miles long, including the 2.25 miles of relocated Sickler-Schultz line and 2 miles of rebuilt line between Schultz Substation and the Naneum Crossing.

There is a potential reroute within Segment A. This reroute was introduced when BPA identified a potential difficulty in acquiring the rights to build the new line parallel to the existing Schultz-Vantage Line across a large parcel northwest of Colockum Road. This parcel of land is under Tribal Allotment status, with Native American landowners. The Segment A Reroute would be located around the land parcel in question. BPA's right to keep the existing Schultz-

Vantage Line on the property was also in question; therefore, the Segment A Reroute includes the relocation of the existing line.

If the Segment A Reroute were to be chosen, a little more than a mile of the existing Schultz-Vantage Line would be removed. Please see Appendix B, *Description and Comparison of Impacts Along Segment A Reroute,* for greater detail of the Segment A Reroute.

BPA's preference is to keep the existing line where it is and to build the new line along Segment A.

Segment B starts where the new transmission line would cross to the south side of the existing Schultz-Vantage line south of I-90 and has two route options: B_{NORTH} and B_{SOUTH}.

B_{NORTH} runs to the east, parallel to and 1,200 feet south of the Schultz-Vantage line. This route option follows the existing line across the Columbia River and ends at the BPA Vantage Substation. B_{NORTH} is 9.1 miles long.

B_{SOUTH} would initially run to the southeast, then cross two other transmission lines and turn almost due east. The new line would parallel an existing 230-kV wood pole transmission line on the south side of the John Wayne Trail for approximately 5 miles. Just before the Columbia River, B_{SOUTH} would angle slightly to the north towards the Schultz-Vantage line. The two lines would parallel one another with a 300-foot separation and would cross the Columbia River. B_{SOUTH} ends at the south end of the BPA Vantage Substation. B_{SOUTH} is approximately 9.5 miles long.

Segment C starts in the same place as Segment B (where the new line would cross the existing Schultz-Vantage line). The segment would turn south, crossing the Yakima Training Center (YTC). This segment would not parallel an existing line. The segment would angle southeast, leave the YTC, cross Highway 24 and end where it intersects the existing Hanford-Ostrander and Hanford-John Day 500-kV transmission lines. This intersection of lines would be the site of a new substation, called Wautoma Substation. Segment C is 30.1 miles long.

Segment D starts in the area just south of Vantage Substation. It would head in a southeasterly direction, running parallel approximately 125 feet to the west of the existing Midway-Vantage 230-kV line. This separation would continue for approximately 4 miles and cross Crab Creek.

While climbing the Saddle Mountains, the separation between the new and existing lines would increase, with the widest point

For Your Information

Double-circuit *towers hold conductors for two transmission lines.*

(approximately 400 feet wide) at the top of the mountain. The separation would slowly decrease on the south side of the Saddle Mountains and the lines would be immediately adjacent to one another approximately 9 miles south of Vantage Substation.

Northeast of Mattawa, the Midway-Vantage line would be removed and replaced with ***double-circuit*** structures carrying the new line and the Midway-Vantage 230-kV line through irrigated areas. This double-circuit section would be about 8 miles long. Beyond the irrigated areas, just north of the Columbia River, Segment D would again parallel the Midway-Vantage line on the west side and cross the Columbia River. Segment D would pass the BPA Midway Substation on the west side and continue south up the Umtanum Ridge. The new line would parallel the existing Midway-Big Eddy 230-kV line 125 feet to the west. South of State Route 24, the new line would cross to the east side of the Midway-Big Eddy where it crosses two other lines. The new line would angle away from the existing lines as it climbs and descends the Yakima Ridge, terminating in the new Wautoma Substation. Segment D is 26.7 miles long.

Segment E begins at Vantage Substation and heads south, paralleling the existing Vantage-Hanford 500-kV line 1,200 feet to the north. It would cross Crab Creek, climb the Saddle Mountains and head southeast, crossing the Saddle Mountain Unit of the Hanford Reach National Monument. After crossing the Columbia River, Segment E would end at the existing BPA Hanford Substation. Segment E is 25.3 miles long.

Segment F begins at Vantage Substation and heads east, then south crossing Crab Creek and climbing the Saddle Mountains. It would then follow the Vantage-Hanford line for a short length before turning due east. Segment F would traverse about 14 miles along the south slope of the Saddle Mountains, and then intersect the Grand Coulee-Hanford 500-kV transmission line. It would then turn south and parallel the existing Grand Coulee-Hanford line 1,200 feet to the east across the Wahluke Slope. After crossing the Columbia River, the segment ends at the Hanford Substation. Segment F is 32.8 miles long.

S.2.2 Preferred Alternative–Alternative 2

BPA is proposing to construct a new 500-kV transmission line between the Schultz Substation, almost 9 miles north of Ellensburg, Washington, and a new substation (Wautoma Substation) in Benton County, 2 miles south of Highway 24. The Preferred Alternative is Alternative 2, is made up of Segments A (including Option 1 of the

Sickler-Schultz Reroute), B_{SOUTH}, and D, and is 63.7 miles long. It does not include the Segment A Reroute.

The Preferred Alternative would cost approximately $107,000,000 (2002 dollars).

S.2.2.1. Structures

The Preferred Alternative would primarily use 500-kV, ***single-circuit*** steel lattice structures, also called towers, to support the transmission line conductors. More than half of the structures would be delta configuration. Flat configuration structures would be used in three selected areas. The first area would be approximately 16.2 miles, from approximately 1 mile north of Interstate 90 (I-90) in Segment A, south through the YTC and across the Columbia River in B_{SOUTH}. The next section would be in Segment D starting just north of Crab Creek going south up and over the Saddle Mountains across BLM land for 4.4 miles. The last section of flat configuration would start after the agricultural area just north of the Columbia River. Flat configuration would be used over the Columbia River, past Midway Substation and up Umtanum Ridge. The length of this last section would be approximately 3.2 miles, most of the Hanford Monument crossed.

Through the agricultural area in Segment D, 500-kV double-circuit lattice structures would be used to hold the new 500-kV and the existing 230-kV line. The height of each structure would vary by location and surrounding land forms. Single-circuit delta structures would average 135 feet high. Flat configuration structures would average 90 feet high. The double-circuit structures would average 170 feet high.

S.2.2.2. Conductors

The wires or lines that carry the electrical current in a transmission line are called conductors. ***Alternating current*** transmission lines, like the new line, require three sets of wires to make up a circuit. For a single-circuit 500-kV transmission line, there would be three sets of wires and for a double-circuit line (Segment D) there would be six sets of wires.

Conductors are not covered with insulating material, but rather use the air for insulation. Conductors are attached to the structure using porcelain or fiberglass insulators. Insulators prevent the electricity in the conductors from moving to other conductors, the structure, and the ground.

Two smaller wires, called overhead ground wires, are attached to the top of transmission structures. Overhead ground wires protect the transmission line from lightning damage. To disseminate the electrical

For Your Information

BPA completed a detailed cost estimate for the Preferred Alternative. The new cost is approximately 40% greater than the cost stated in the DEIS. Detailed cost estimates were not completed for the other alternatives. To be able to compare costs of alternatives, the estimated costs from the DEIS were increased by 40%.

*A transmission line designed to hold one electrical circuit is called **single-circuit.***

***Alternating current** is an electrical current that reverses directions at regular intervals.*

power from lightning, the power is routed to the ground at each tower through wires called counterpoise.

S.2.2.3. Right-of-Way

New ROW would be needed for the new structures and line. The new ROW would be 150 feet wide for the delta configuration structures and 180 feet wide for flat configuration. The wider ROW for the flat configuration provides adequate electrical clearance for the conductors. Where the new line would parallel an existing 500-kV line (Segment A), the centerline of the new line would be from 200 to 1,375 feet from the existing line. The land between the two transmission lines may (depending on landowner preference) be included in the easement BPA would acquire from the landowner. The distance from the new line centerline to the nearest edge of ROW would depend on the type of structure, 75 feet for delta and 90 feet for flat (to provide adequate electrical clearances).

From I-90 south in the YTC, the new line would be located in a 180-foot-wide ROW until it joins a 115-kV line along the John Wayne Trail. In this portion of the line, the ROW would be 150 feet wide directly adjacent to the ROW of the other line. Once these two lines diverge, the new line would join the Schultz-Vantage line at a 300-foot separation and cross the Columbia River. The distance from the centerline of the new line to the outside of the ROW would be 100 feet.

In Segment D, where the existing line would be replaced with a double-circuit line, the existing ROW would be expanded 25 feet on the west side, increasing the ROW from the existing 100 feet to 125 feet. Where the new line is parallel to the 230-kV line using a delta configuration, the new ROW would be 150 feet wide. Where flat configuration would be used, the new ROW would be 180 feet wide.

BPA would obtain easements from landowners for new ROW. Fee title to the land covered by the easement generally remains with the owner, and is subject to the provisions of the easement.

S.2.2.4. Clearing

Vegetation within the ROW is restricted by height. This is required for the safe and uninterrupted operation of the line. Approximately 45 trees surrounding 5 creeks would be removed from within new ROW. In addition, there are a few trees outside of the ROW near Cooke Creek that would potentially need to be cut. These trees are tall enough cause an outage if they were to fall. Tree specialists would examine the trees, if the trees are stable they could remain standing, but if they are dying or diseased then they would be cut.

Trees that would not typically grow taller than BPA safety limits would not cleared from the ROW.

At the structure sites, all trees and brush would be cut and removed within a 100-by-150-foot area, with root systems being removed from a 50-by-50-foot area for the tower footings. A portion of the site would be graded to provide a relatively level work surface for the erection crane, unless helicopter erection is used. The footprint of the structures would be considered permanent disturbance for vegetation. The average footprints are 25 by 25 feet for flat configuration, 27 by 27 feet for delta configuration, and 32 by 32 feet for the double-circuit structures. The total permanent disturbance as a result of the 298 structures in the Preferred Alternative would be 5.8 acres. Temporary disturbance from the equipment movement around the structures would be 119.2 acres. If Option 2 of the Sickler-Schultz Reroute is selected, the structure count would increase by 2, permanent disturbance would increase by 0.05 acre and temporary disturbance would increase by 0.8 acre.

S.2.2.5. Access Roads

Access roads on and off the ROW would be used to construct and maintain a new line. A combination of new roads, upgraded existing roads, and existing roads would be used to access the new line. Existing access roads would be used whenever possible, with ***spur roads*** constructed to the new structures.

New roads would be located within the ROW wherever possible. Where conditions require, such as at steep cliffs, roads would be constructed and used outside the ROW. BPA normally acquires easements for the right to develop and maintain permanent over-ground access for wheeled vehicle travel to each structure. No permanent access road construction would be allowed in cultivated or fallow fields unless previously agreed to by the landowner. After construction of the line is completed, BPA would allow any roads in cropland to be returned to crop production.

New access roads surfaces would be 14 feet wide, with a 3-foot temporary disturbance area on either side of the road. New and existing road beds would be gravel or rock. Approximately 18 miles of new roads would be built and 56.3 miles of existing roads would be improved.

Existing access roads would be upgraded to 14 feet. In areas where helicopter construction would be used, road widths would be reduced to 12 feet.

For Your Information

Spur roads *are short road segments branching off the trunk roads that go to each structure if the structure is not located on a trunk road.*

For Your Information

Waterbars *are smooth shallow ditches excavated at an angle across a road to decrease water velocity and divert the water off and away from the road surface.*

Dips, culverts, and ***waterbars*** would be installed within the roadbed to provide drainage. Fences, gates, cattle guards, and additional rock would be added to access roads where necessary.

S.2.2.6. Pulling and Reeling Areas

Pulling and reeling areas would be needed for the installation of the conductor. Each pulling and reeling area would be 1/4 acre in size and located every 3.5 miles along the transmission line. The Preferred Alternative would require an estimated 4.25 acres to be cleared for the pulling and reeling areas along the route. Most of the pulling and reeling sites would be located within the ROW. Some would extend beyond the ROW at angles in the line.

S.2.2.7. Staging Areas

During construction of the transmission line, areas would be needed off the main highways, near the ROW, where equipment such as steel, spools of conductor, and other construction materials would be stored until material is needed. Where helicopters would be used to build the transmission line, staging areas would be used to pre-assemble the towers for helicopter delivery to tower sites. These sites would be close to the line and spaced about 8 to 10 miles apart.

Staging area locations would be determined by the construction contractor just before or during construction. The size of each site would vary. The construction contractor would negotiate with the landowner for the use of staging sites. An environmental review would be done before the use of a staging site is approved.

At this time, staging area locations are not known.

S.2.2.8. Substations

*The term **buswork** describes all equipment associated with the bus tubing. Bus tubing is rigid aluminum pipes used within a substation to move electricity. The tubing is supported and vertically elevated by pedestals called bus pedestals.*

A potential transformers (PT) *is a type of transformer that uses low-voltage to monitor the high-voltage system.*

For the Preferred Alternative, a new transmission line would begin at Schultz Substation and terminate at a new substation, called Wautoma Substation. Additions and modifications would occur at Schultz Substation. No work would be needed at the Vantage or Midway Substations.

Schultz Substation – A new bay would be constructed within the existing fenced yard of the substation. New equipment within the substation would include power circuit breakers, motor-operated disconnect switches, ***buswork***, ***potential transformers (PT's)***, and substation dead-end towers.

Wautoma Substation – A new substation would be constructed in Benton County, 2 miles south of Highway 24 (T12N, R24E, Section 20). The new substation would be sited at the intersection of the new transmission line and the Hanford-Ostrander 500-kV and Hanford-John Day 500-kV transmission lines. These two lines would be looped through the new substation. A parcel of approximately 47 acres would be purchased for the new substation. Land for the new substation would be acquired in fee and would remain in BPA and federal government ownership. A substation access road, just less than a mile long, would be built from SR 241 to the new substation.

The footprint of the substation would be approximately 820 feet by 530 feet. This area would include the substation yard (equipment within the fence) and grading outside of the fence. The actual fenced area would be about 780 feet by 490 feet. This substation would be built slightly differently than the standard substation because existing lines cross the substation site and there are existing towers within the footprint of the substation. These lines would not be taken out of service during construction of the substation, so construction would occur under energized lines. Equipment such as breakers, buswork, switches, and PT's would be installed in the yard, and the control rack would be installed in the control house.

S.2.2.9. Communications Equipment

BPA substations are electronically connected to BPA's transmission system control centers. Microwave communication sites and fiber-optic communication lines connect BPA's high-voltage substations to system control centers located in Vancouver and Spokane, Washington.

As part of the Preferred Alternative, BPA would install fiber optic cable between Vantage Substation and the new Wautoma Substation (approximately 27 miles) and from Vantage Substation north to the BPA Columbia Substation (approximately 32 miles). The new fiber would enable remote operation of the new substation as well as reinforce BPA's communication network.

From Vantage to Columbia Substation, fiber would be strung on existing transmission line structures. No new ROW would be needed and existing roads would be used for fiber installation. From Vantage to the new Wautoma Substation, the fiber would be strung on a combination of the new double-circuit transmission structures and existing lines. A combination of existing roads and new roads that would be built for the new transmission line would be used for fiber installation. From the new Wautoma Substation, fiber would also be installed on existing structures to loop back to the Midway Substation. Existing access roads would be used for fiber installation and no road improvements are expected.

The fiber cable would be less than 1 inch in diameter and would be mounted under the conductors. Every 3 to 5 miles there would be a splice box/reeling location for the stringing and tensioning of the fiber optic line. The splice box would be located on a transmission tower and an area approximately 1/4 acre in size in line with the conductors would be temporarily disturbed by a reeling truck and tensioning equipment. Five acres of temporary disturbance for the Preferred Alternative would be associated with the fiber line.

S.2.2.10. Maintenance

BPA would perform routine, periodic maintenance and emergency repairs on structures, substations, and accessory equipment. These activities typically include replacing insulators, inspections of structures, and vegetation control. Within the substations, BPA may need to periodically replace equipment.

Existing and new permanent access roads to structures would remain throughout the life of the line so that BPA can perform routine and emergency maintenance on the transmission line. Road maintenance could include grading and clearing, and repairing ditches and culverts.

For Your Information

The BPA Transmission System Vegetation Management Program EIS was completed in August 2000, and describes the planning steps, agencies and landowners to be coordinated with, and the tools to be used to control vegetation along BPA facilities. This document is available for review on the Web at http://www.efw.bpa.gov/cgi-bin/PSA/NEPA/SUMMARIES/VegetationManagement_EIS0285.

A large part of maintenance activities is vegetation control. In Central Washington, this primarily focuses on the spread of noxious weeds. Tall growing vegetation would also need to be managed in and adjacent to the ROW, primarily where the line crosses water bodies. Vegetation maintenance activities would follow the guidelines set in the BPA Transmission System Vegetation Management Program EIS. When vegetation control is needed, a vegetation management checklist would be developed for the ROW. It would identify sensitive resources and the methods to be used to manage vegetation. Substations are periodically sprayed with herbicide to keep plants from growing and creating a safety hazard.

S.2.3 Alternative 1

Reminder

Detailed cost estimates were not completed for the other alternatives. To be able to compare costs of alternatives, the estimated costs from the DEIS were increased by 40%.

Alternative 1 would start at the Schultz Substation and follow the Schultz-Vantage line along Segments A and B_{SOUTH}. As with the Preferred Alternative, Alternative 1 would not include the Segment A Reroute. It would then follow the existing Vantage-Hanford 500-kV line 1,200 feet to the north along Segment E, and would be 62.3miles long. The new line would end at the existing Hanford Substation.

This alternative has an estimated cost of $124,000,000.

S.2.3.1. Structures

Alternative 1 would use 500-kV delta and flat configuration single-circuit steel lattice structures. The height of each structure would vary by location and surrounding land forms; the delta configuration structures would have an average height of 135 feet, while the flat configuration structures would average 90 feet.

S.2.3.2. Conductors

The single-circuit transmission line would be made up of three sets of wires. The insulators and overhead ground wires would be the same as discussed earlier for the Preferred Alternative.

S.2.3.3. Right-of-Way

The ROW would be 150 feet wide for the delta configuration structures and 180 feet wide for the flat configuration structures. The distances and ROW widths for Segments A and B_{SOUTH} would be the same as described in the Preferred Alternative. Along Segment E, similar to in Segment A, where the line separation would be 1,200 feet, BPA would acquire easement rights from the landowners for the land between the two lines, including the new ROW.

Easement provisions would be the same as those discussed earlier for the Preferred Alternative.

S.2.3.4. Clearing

Clearing requirements would be the same as those discussed earlier for the Preferred Alternative. The structure footprints would be the same as described earlier for the single-circuit structures. The total permanent disturbance as a result of the 281 structures would be approximately 5.6 acres. Temporary disturbance from the equipment movement around the structures would be approximately 114.3 acres. If Option 2 of the Sickler-Schultz Reroute is selected, the structure count would increase by 2, permanent disturbance would increase by 0.05 acre and temporary disturbance would increase by 0.8 acre.

S.2.3.5. Access Roads

A new access road system would be built for the majority of Alternative 1. Wherever possible, the access roads would be located on the ROW. BPA normally acquires easements for the right to develop and maintain permanent over-ground access for wheeled vehicle travel to each structure. No permanent access road construction would be allowed in cultivated or fallow fields. Any roads in cropland would be removed and the ground would be restored to the original contour when construction of the line is completed.

New access roads surfaces would be 14 feet wide, with a 3-foot temporary disturbance area on either side. New and existing road beds would be gravel or rock. Approximately 22.6 miles of new roads would be built and 87.6 miles of existing roads would be improved.

Existing access roads would be upgraded to 14 feet. In areas where helicopter construction would be used, road widths would be reduced to 12 feet.

Drainage, fences, and gates would be installed where needed as described earlier for the Preferred Alternative.

S.2.3.6. Pulling and Reeling Areas

Pulling and reeling area requirements would be the same as those discussed earlier for the Preferred Alternative. Alternative 1 would require an estimated 4.5 acres to be cleared for the pulling and reeling areas along the route.

S.2.3.7. Staging Areas

Staging areas would be located and used similar to those described earlier for the Preferred Alternative.

S.2.3.8. Substations

For Alternative 1, a new transmission line would begin at the Schultz Substation and end at Hanford Substation. The line would pass through the Vantage Substation, but no electrical equipment would be installed within the Substation as part of this project.

Schultz Substation – The new equipment installed at Schultz Substation would be the same as described earlier for the Preferred Alternative.

Hanford Substation – A new bay would be constructed within the existing fenced yard of the substation. Outside of the substation fence, one or two of the existing transmission line structures may need to be relocated in order to align with the readjusted substation equipment. The new equipment within the substation would include breakers, switches, buswork, and PT's.

Vantage Substation – The line would pass through the Vantage Substation in order to get from the west to east side of existing lines. A new bay and dead end would be constructed within the existing fenced yard of the substation. Some existing transmission line towers may need to be moved to make room for the new line.

S.2.3.9. Communications Equipment

As part of Alternative 1, BPA would install fiber optic cable between Vantage Substation and Midway Substation (about 19.3 miles) and from Vantage Substation north to the BPA Columbia Substation (about 32 miles). The new fiber would reinforce BPA's communication network and make the fiber optic system more reliable.

The fiber optic cable would be strung on existing transmission line structures. The fiber cable would be less than 1 inch in diameter. As described in the Preferred Alternative, every 3 to 5 miles there would be a splice box/reeling location for the stringing and tensioning of the fiber optic line. These sites would result in 1/4 acre of temporary disturbance each or approximately 4.25 acres for the new fiber to be installed as part of Alternative 1.

S.2.3.10. Maintenance

Maintenance activities would be similar to those described earlier for the Preferred Alternative.

S.2.4 Alternative 3

Alternative 3 would start at the Schultz Substation and follow Segment A. It would not include the Segment A Reroute. It would then turn south and follow Segment C through the YTC. South of the YTC in Benton County, the line would terminate at the new Wautoma Substation as described earlier for the Preferred Alternative and would be 57.6 miles long.

This alternative has an estimated cost of $94,000,000. No land costs were added to the estimate for the purchase of easements across the YTC. Due to the large impact to the Army, BPA would possibly need to compensate the Army for the loss of the use of land used for maneuvers, thereby potentially increasing the cost of Alternative 3.

Reminder

Detailed cost estimates were not completed for the other alternatives. To be able to compare costs of alternatives, the estimated costs from the DEIS were increased by 40%.

S.2.4.1. Transmission Line

The structures used in Segment A would be the same as described in the Preferred Alternative. The structures within Segment C across the YTC would be flat configuration for approximately 24 miles. Outside of the YTC land, delta configuration structures would be used for approximately 6 miles.

S.2.4.2. Right-of-Way

The ROW would be 180 feet wide for the flat configuration structures and 150 feet wide for the delta configuration structures. The distances and ROW widths for Segment A would be the same as described in the Preferred Alternative. Along Segment C, the ROW width would reflect the width needed for the particular structures; this portion of the line would not be parallel to any existing lines.

Easement provisions would be the same as those discussed earlier for the Preferred Alternative.

S.2.4.3. Clearing

Clearing requirements would be the same as those discussed earlier for the Preferred Alternative. The structure footprints would be the same as described earlier for the single-circuit structures. The total permanent disturbance as a result of the 269 structures would be approximately 4.7 acres. Temporary disturbance from the equipment movement around the structures would be approximately 110 acres.

S.2.4.4. Access Roads

New access roads would be built for the majority of Alternative 3. Roads would be built as described earlier for the Preferred Alternative. Approximately 95.2 miles of new roads would be built and 98.3 miles of existing roads would be improved.

S.2.4.5. Pulling and Reeling Areas

Pulling and reeling area requirements would be the same as those discussed earlier for the Preferred Alternative. Alternative 3 would require an estimated 4.75 acres to be cleared for the pulling and reeling areas along the route. If Option 2 of the Sickler-Schultz Reroute is selected, the structure count would increase by 2, permanent disturbance would increase by 0.05 acre and temporary disturbance would increase by 0.8 acre.

S.2.4.6. Staging Areas

Staging areas would be located and used similar to those described earlier for the Preferred Alternative.

S.2.4.7. Substations

For Alternative 3, a new transmission line would begin at the Schultz Substation and end at the new Wautoma Substation.

Schultz Substation – The new equipment installed at Schultz Substation would be the same as described earlier for the Preferred Alternative.

Wautoma Substation – The construction of the substation would be the same as described earlier for the Preferred Alternative.

S.2.4.8. Communication Equipment

Alternative 3 would include the installation of fiber optic cable between Vantage Substation north to Columbia Substation as well as south to the new Wautoma Substation as described in the Preferred Alternative. Between Vantage and the new Wautoma Substations, the fiber would be added to existing lines. The number of reeling and tensioning sites and the amount of disturbance caused by those would be approximately the same as that of the Preferred Alternative.

S.2.4.9. Maintenance

Maintenance activities would be similar to those described earlier for the Preferred Alternative.

S.2.5 Alternative 1A

Alternative 1A would start at the Schultz Substation and follow Segments A and B_{SOUTH}. As with the Preferred Alternative, Alternative 1A would not include the Segment A Reroute. The new line would enter the Vantage Substation and cross to the east side of the existing transmission lines. The line would then follow Segment F into Hanford Substation. The line would be approximately 69.8 miles long. The outside limits of the Hanford Substation would not need to be expanded for this alternative.

This alternative has an estimated cost of $94,000,000.

Reminder

Detailed cost estimates were not completed for the other alternatives. To be able to compare costs of alternatives, the estimated costs from the DEIS were increased by 40%.

S.2.5.1. Structures

In Segment F, delta configuration structures would be used out of Vantage Substation, but just north of Crab Creek flat configuration structures would be used continuing south up the Saddle Mountains. Due to wildlife concerns, flat configuration would be used along the Saddle Mountains, through the Hanford Monument, and into Hanford Substation.

S.2.5.2. Conductors

The conductors and overhead groundwire would be the same as discussed earlier for the Preferred Alternative.

S.2.5.3. Right-of-Way

The ROW would be 150 feet wide for the delta configuration structures and 180 feet wide for the flat configuration structures. The distances and ROW widths for Segments A and B_{SOUTH} would be the same as described in the Preferred Alternative. Along Segment F, the ROW width would be 180 feet wide for the flat configuration. Where the line would turn south and parallel the existing 500-kV transmission line, the separation would be 1,200 feet. BPA would acquire easement rights from the landowners for the land between the two lines, including the new ROW.

Easement provisions would be the same as those discussed earlier for the Preferred Alternative.

S.2.5.4. Clearing

Clearing requirements would be the same as those discussed earlier for the Preferred Alternative. The structure footprints would be the same as described earlier for the single-circuit structures. The total permanent disturbance as a result of the 326 structures would be approximately 6.5 acres. Temporary disturbance from the equipment movement around the structures would be approximately 133.2 acres. If Option 2 of the Sickler-Schultz Reroute is selected, the structure count would increase by 2, permanent disturbance would increase by 0.05 acre and temporary disturbance would increase by 0.8 acre.

S.2.5.5. Access Roads

New access roads would be built for the majority of Alternative 1A. Roads would be built as described earlier in Alternative 1. Approximately 43.4 miles of new roads would be built and 69.8 miles of existing roads would be improved.

S.2.5.6. Pulling and Reeling Areas

Pulling and reeling area requirements would be the same as those discussed earlier for the Preferred Alternative. Alternative 1A would require an estimated 5 acres to be cleared for the pulling and reeling areas along the route.

S.2.5.7. Staging Areas

Staging areas would be located and used similar to those described earlier for the Preferred Alternative.

S.2.5.8. Substations

For Alternative 1A, a new transmission line would begin at the Schultz Substation and end at Hanford Substation. The line would pass through Vantage Substation.

Schultz Substation – The new equipment installed at Schultz Substation would be the same as described earlier for the Preferred Alternative.

Hanford Substation – The new equipment installed at the Hanford Substation would be the same as described earlier for Alternative 1.

Vantage Substation – The line would pass through the Vantage Substation in order to get from the west to east side of existing lines as described earlier for Alternative 1.

S.2.5.9. Communication Equipment

BPA would install fiber optic cable similar to what is described earlier for Alternative 1.

S.2.5.10. Maintenance

Maintenance activities would be similar to those described earlier for the Preferred Alternative.

S.2.6 No Action Alternative (Environmentally Preferred)

The No Action Alternative is traditionally defined as the no build alternative and, for this project, is the Environmentally Preferred Alternative. This alternative would mean that a new transmission line would not be built, and no other equipment would be added to the transmission system. Maintenance and operation of the existing transmission line and substations would continue unchanged.

S.2.7 Alternatives Eliminated from Detailed Consideration

BPA studied a variety of alternatives to meet the need for the project. After preliminary study, the following alternatives were eliminated from detailed consideration for technical or economic reasons.

S.2.7.1. Alternative 4 Transmission Line

BPA studied the possibility of paralleling the existing Columbia-Ellensburg-Moxee-Midway 115-kV transmission line. The new line would begin at Schultz Substation and be routed through Ellensburg and Yakima, west of the YTC and into a new substation. This was referred to as Alternative 4 during the scoping period. BPA received a large number of comments from the public in opposition to this alternative. The existing 115-kV line is adjacent to many homes. Early estimates showed that the cost to buy property and relocate residents would be over $60,000,000. This did not include new transmission equipment, substation equipment, or construction costs. This alternative was eliminated from further study due to cost.

S.2.7.2. Schultz-Ashe Transmission Line

During the scoping process, maps presented by BPA showed a possible route going through the Hanford Substation and on to the BPA Ashe Substation located on the Hanford Site. Transmission system studies showed that line termination at the Ashe Substation, rather than the Hanford Substation, did not improve reliability. Termination of the line at the Ashe Substation also did not improve transfer capability over the Hanford Substation or Wautoma Substation alternatives. The 17 additional miles of transmission line needed for this alternative would increase the cost of construction by about $13,000,000.

This alternative was eliminated from further study because the system studies did not show an electrical benefit versus the added cost associated with the added miles of transmission line.

S.2.7.3. Undergrounding

During the scoping process, some people suggested burying the transmission line. Occasionally BPA has used underground transmission cables for new lines. Transmission line cables are highly complex in comparison to overhead transmission lines. For a 500-kV line, the underground cable could be 10 to 15 times the cost of an overhead design. Because of cost, BPA uses underground cable in limited situations, such as for long water crossings or in urban areas.

Underground transmission cables used by BPA are short in comparison to typical overhead transmission lines. BPA's longest underground transmission cable (at 115-kV) is 8 miles.

Underground cable remains a tool available for special situations, but because of its high cost it was eliminated from further consideration.

S.2.7.4. Non-Transmission Alternatives

During the comment period of the DEIS, comments were received asking BPA to examine alternatives such as energy conservation and demand reduction measures, or load and generation curtailment during outage conditions. These types of alternatives are collectively referred to as non-transmission alternatives. BPA had examined these types of alternatives, but had not included them in the DEIS.

To meet the need described in Chapter 1, BPA considered non-transmission alternatives, including energy conservation and demand reduction measures to reduce overload on the transmission system, as well as load and generation curtailment during outage conditions. Results of this study are in a report entitled "Expansion of BPA Transmission Planning Capabilities," which has been incorporated by reference in this EIS (Energy and Environmental Economics, Nov. 2001). This report concluded that conservation and demand management alternatives would only make the problem worse by increasing the amount of electricity that must cross the north of Hanford area. Other non-transmission alternatives that were considered included ***locational pricing*** and ***time-of-use rates***. These pricing alternatives provide price signals to encourage parties to use limited transmission capability more efficiently. The report concluded that these pricing alternatives would not be feasible because they would require spilling water during the spring and early summer months, which would violate ESA conditions.

S.3 Affected Environment

This section summarizes the existing environment that may be affected by the alternatives. Each section describes a specific resource. The natural environment is discussed first, then the human environment.

S.3.1 Water Resources

S.3.1.1. Precipitation

Most of the study area is in the rain shadow of the Cascades, which results in a semiarid climate. Most precipitation in the study area falls as rain, with as little as 7 to 8 in of precipitation per year at lower elevations.

S.3.1.2. Watersheds

River basins crossed by all of the alternatives are the Central Columbia and Yakima. Within these basins the streams crossed by the segments, including the Vantage-Columbia fiber optic line, fall into six watersheds: the Lower Yakima, Upper-Columbia-Priest Rapids, Lower Crab, Upper Yakima, Upper Columbia-Entiat, and Moses Coulee. Some of the ***perennial streams*** crossed include Lower Crab Creek, Naneum Creek, and Wilson Creek, in addition to the Columbia River. Due to low precipitation in the study area, streams are generally small and ***intermittent***.

For Your Information

*A **perennial stream** flows throughout the year.*

*An **intermittent stream** flows only seasonally.*

S.3.1.3. Water Quality

The Lower Yakima and Upper Columbia-Priest Rapids are identified as having serious water quality problems, such that aquatic conditions are well below state and tribal water quality goals (EPA, 2000). The remaining three watersheds (Lower Crab, Upper Yakima, and Upper Columbia-Entiat) have less serious problems, although their aquatic conditions are also below state or tribal water quality goals (EPA, 2000). Lower Crab Creek, Mattawa Drain, Sand Hallow, and the

For Your Information

Water quality limited *under Section 303(d) of the Federal Clean Water Act refers to streams that do not meet current water quality standards.*

Columbia River are listed as ***water quality limited*** under Section 303(d) of the Federal Clean Water Act.

S.3.1.4. Shorelines

The Washington State Shoreline Management Act allows for cities or counties to guide the planning and management necessary to prevent the potential harmful effects of uncontrolled development along the shorelines of Washington State. The segments cross one river (Columbia), two creeks (Naneum and Lower Crab), and one lake (Nunnally) that have been designated as shorelines.

S.3.1.5. Aquifers

Aquifers between Miocene basaltic rocks are prominent in the Columbia Plateau basaltic aquifer system. Groundwater quality in the proposed study area is variable, depending on the layer of basalt from which the groundwater is taken. The Columbia Plateau basaltic aquifer system is a major source of water for municipal, agricultural, and domestic uses (USGS 1991).

S.3.2 Floodplains and Wetlands

S.3.2.1. Floodplains

Eleven floodplains associated with the following water features would potentially be crossed within the study area: Wilson/Naneum Creek crossings, Cooke Creek, Columbia River crossings, Lower Crab Creek, Nunnally Lake, and Dry Creek. The Vantage-Columbia fiber optic line would cross: Mosses Coulee, Lynch Coulee, Quincy Lakes, an unnamed creek, and Sand Hallow Creek. The Columbia River 100-year floodplain is relatively narrow because dams in the study area regulate flows. It is very unlikely that large scale flooding would occur because of the construction of several flood control/water-storage dams upstream of the study area.

S.3.2.2. Wetlands

Wetlands are uncommon within the shrub-steppe areas of eastern Washington. Wetlands found in this area typically are supported by water sources such as springs, surface runoff, and riparian areas. The presence of wetlands in the study area (500 feet either side of the proposed line) was initially investigated using National Wetlands Inventory (NWI) maps. NWI maps depict natural and human-made wetlands and other special aquatic features.

Twenty-five NWI features were identified within the study area for the Preferred Alternative. Of those, 7 were field verified as wetlands. Alternative 1 has 29 NWI features, Alternative 3 has 31 NWI features, and Alternative 1A has 28 NWI features. Wetlands along Alternatives 1, 3, and 1 A have not been field verified.

S.3.3 Soils and Geology

Diverse landforms and geologic features exist within the study area, which is in the Columbia Plateau ***physiographic*** province. The landscape within the plateau consists mostly of large and small hills with flat tops, extensive plateaus, ***incised*** rivers, and ***anticline*** ridges. The ***Miocene Columbia River Basalt Group*** underlies the region and is interbedded by ***Neogene*** terrestrial sediments (DNR, 1991).

Geologic hazards in the study area include steep slopes and erosion. Soil blowing and water erosion are the most active erosion processes due to the area's high relief, steepness of slope, and restricted available water capacity for the production of ***forage*** (USDA, 1984).

S.3.4 Vegetation

S.3.4.1. Cover Types

The study area lies within the Columbia River Basin province of eastern Washington and Oregon (Franklin and Dyrness, 1973). The ***plant community*** found in most of the study area is referred to as shrub–steppe. With the exception of several riparian areas, there are few trees in the study area. The dominant woody vegetation on most upland sites consists of shrub species, predominantly sagebrush species. The understory of herbaceous plants in shrub-steppe was dominated by native perennial bunchgrasses prior to European settlement. Within portions of the study area, native bunchgrass dominated communities are no longer as common due to invasion by annual grasses and non-native weedy species which colonize and spread after various types of disturbance (Quigley, 1999).

Shrub-steppe vegetation in the study area is characterized as a potential big sagebrush/bluebunch wheatgrass zone (Daubenmire, 1970). This is the community that is expected to occur without disturbance, alteration of habitat, or invasion by non-native species. Dominant shrubs currently existing in upland areas commonly include big sagebrush, threetip sagebrush, stiff sagebrush, low sagebrush, spiny hopsage, gray rabbitbrush, green rabbitbrush, and buckwheat species. In many areas today, non-native species, including cheatgrass, are now co-dominant with the shrubs. Other areas still have a bunchgrass layer of good quality. Common bunchgrass species include bluebunch wheatgrass, Sandberg's bluegrass, Cusick's bluegrass, Indian ricegrass, needle-and-thread grass, and Thurber's needlegrass.

For Your Information

Physiography *is the study of the structure and phenomena of the earth's surface.*

Rivers that have carved a path through the bedrock of an area are ***incised****.*

Anticline *is an arching fold in layered rocks.*

Miocene *is the period in the Neogene lasting from 23 million years ago to 5 million years ago.*

The ***Columbia River Basalt Group****, composed of the Grand Ronde Basalt and the overlying Wanapuma and Saddle Mountains Basalt, comprises most of the aquifer system (USGS 1994).*

Neogene *is the geological period lasting from 23 million years ago to present day.*

Forage *is food for domestic animals, i.e. cattle, sheep, etc.*

Plant communities *(also known as plant associations) are assemblages of species that grow together in similar habitats and are found repeated across the landscape.*

While several riparian areas in the study area have a tree overstory, shrub-lined riparian areas are more common. These riparian areas typically have a narrow margin of upland shrubs, including black hawthorn, red-osier dogwood, mockorange, serviceberry, and big sagebrush. Invasive tree species, such as Russian olive, Siberian elm, and white mulberry grow in some riparian areas and wet areas.

The agricultural lands near the study area are irrigated croplands, vineyards and orchards. There may be small adjacent areas that have some remnants of native plant communities. These remnants typically have low biodiversity and are very weedy.

For Your Information

High quality plant communities are *areas of native vegetation with little or no disturbance or exotic species.*

S.3.4.2. High Quality Plant Communities

The Washington Natural Heritage Program (WNHP) tracks the occurrences of "***high quality plant communities***" (WNHP Website). Two WNHP high quality plant communities occur within the study area. A Wyoming big sagebrush/bluebunch wheatgrass shrubland community occurs along a small portion of Segment A. And, a bitterbrush/Indian ricegrass shrubland community occurs in a broad band north of the Columbia River along segments D, E, and F.

Foot surveys for rare plants and vegetation communities took place along the Preferred Alternative (Segments A, Option B_{SOUTH} and D). Shrub-steppe vegetation communities along these segments was broken into four categories. The Preferred Alternative crossed 0.92mi of Washington Natural Heritage Program Areas, 25.85 mi of Moderate-High Quality Shrub-Steppe, 11.10 mi of Low Quality Shrub-Steppe, and 11.80 mi of ***Lithosol*** Areas.

Lithosols *are rocky soils that usually develop in areas underlain by basalt.*

S.3.4.3. Weeds

Some plant species are designated as weeds by federal or state law. Weed species reduce the quality of shrub-steppe by replacing native species and reducing ***biodiversity***. Washington State law designates some particularly troublesome weeds as "noxious weed" species. The list of noxious weed species is divided into three classes (A, B, and C) within each county, based on the state of invasion. Designated noxious weeds are present on all segments within the study area.

Biodiversity *refers to the different species of plants and animals in an environment.*

S.3.4.4. Rare Plants

The USFWS identified two federally listed species and three federal candidate species with the potential to occur within the study area (USFWS, 2001). Ute ladies' tresses, listed as threatened, is not known to occur in the study area. Wenatchee Mountains checker-mallow, listed as endangered, has the potential to occur 25 mi north of the eastern end of Segment A, but not within the study area. Two of the candidate species, northern wormwood and basalt daisy, are not none to occur within 1 mile of the line segments. However, one population of a federal candidate species (Umtanum desert buckwheat) is known to occur near the Preferred Alternative. Nine BLM sensitive species have the potential to occur on BLM-administered lands along Segment F.

S.3.5 Wildlife

Approximately 150 wildlife species (birds, mammals, reptiles, and amphibians) are known to occupy shrub-steppe habitat, which represents the majority of available habitat within the study area. Of these species, approximately 50 are closely associated with shrub-steppe habitat, and the remaining species use shrub-steppe habitat occasionally or incidentally.

Analysis of wildlife focused on species that are: federally listed as threatened or endangered or candidate for listing; federal species of concern, and Washington state listed threatened, endangered, sensitive or monitor species.

S.3.5.1. Federally Listed or Candidate Species

Six federally listed threatened or endangered wildlife species and one proposed listed species were identified by USFWS as possibly occurring in the study area. Listed species include the grizzly bear, the gray wolf, the Canada lynx, the bald eagle, the northern spotted owl, and the marbled murrelet. The pygmy rabbit is proposed for listing as Endangered.

The grizzly bear, gray wolf, Canada lynx, northern spotted owl, and marbled murrelet are not known to currently exist in the project area, so the proposed project will have no impacts on these species.

Bald eagles are known to exist near water throughout the project area. The Columbia River crossings at Vantage, Midway, and the Hanford National Monument provide good open water foraging habitat and larger riparian trees for roosting. Wilson and Naneum creeks contain winter roost habitat for bald eagles. The YTC near Hanson and Alkali Canyon Creeks also contains winter roosting areas. No nest sites are known within 2 miles of any of the segments.

There have been no confirmed sightings of pygmy rabbits within the project area.

S.3.5.2. Federal Species of Concern

Approximately 23 federal species of concern are known to occur within the study area of the various alternatives.

S.3.5.3. Washington State Species

Approximately 45 wildlife species that are listed by Washington State as threatened, endangered, sensitive or monitor species are known to occur within the study area of the alternatives.

S.3.6 Fish Resources

The most significant fish resources found within the project area are endangered anadromous salmonids such as salmon and steelhead. These fish are born and rear in small streams, then migrate down the Columbia River to the ocean. After several years in the ocean, they migrate upstream back to their native streams to spawn. Resident salmonids such as bull trout and rainbow trout are also important resources, as are a number of other cold and warm water fish species.

S.3.6.1. Chinook Salmon

Upper Columbia spring-run Chinook would be encountered in the Columbia River, which juveniles and adults use as a migration corridor between the ocean and the headwater streams they spawn and rear in.

S.3.6.2. Steelhead Trout

The Upper Columbia River Steelhead would be encountered in the Columbia River and tributaries upstream of the Yakima River, which they would use for migrating, spawning and rearing purposes.

The Middle Columbia River Steelhead would be encountered in tributaries of the Yakima River, although these tributaries have blockages from dams and irrigation withdrawals that do not allow steelhead access to the area crossed by the project.

For Your Information

A Distinct Population Segment (DPS) *is a population of a species with a distinct evolutionary history as defined by the U.S. Fish and Wildlife Service.*

S.3.6.3. Bull Trout

The proposed study area is located within the Columbia River ***Distinct Population Segment*** (***DPS***) for bull trout. Bull trout may be found in small streams along Segment A and the Columbia River.

The only portion of the project that crosses lands within Douglas County is the fiber optic line for roughly 5 miles. No land use issues would arise and no impacts would occur since the fiber optic line would be installed on existing structures and construction equipment would use existing roads.

S.3.7 Land Use

The project crosses through private lands and publicly administered lands in four Washington counties: Kittitas, Grant, Benton, Yakima, and Douglas.

S.3.7.1. Kittitas County

Kittitas County lies within the upper Yakima River watershed and on the east side of the Cascade Mountains. Mountains and steep hills ring an extensive irrigated area known as the Kittitas Valley where most of the County's residents live. Major irrigation projects of the 1940's and 50's distributed water to the valley floor, turning arid lands into productive farmland.

Segment A is entirely within the County. The majority of Segment B and a portion of Segment C are also within the County. Segments A and B cross both private lands and publicly administered lands. Segment C in Kittitas County would be located completely on publicly administered lands.

S.3.7.2. Grant County

Grant County is bordered by the Columbia River to the west and southwest. The County is a state and national leader in the production of wheat, corn, hay, potatoes, and several tree fruits and is a major livestock production center. Agricultural areas are concentrated throughout the County and the location of agriculture has been strongly influenced by the construction of irrigation facilities.

A small portion of Segment B and the majority of Segments D, E, and F are located within the County. These line segments cross both private lands and publicly administered lands. Most of the fiber optic line is also in Grant County.

S.3.7.3. Benton County

Benton County is located in the central part of the Columbia Basin. The principal land use is commercial dryland and irrigated agriculture with its related industries such as storage, shipping, processing, and sales of chemicals and equipment. Irrigated crop production and dryland agriculture is located throughout the agricultural lands designation. It is estimated that 17 percent of Benton County is irrigated land and 50 percent is range and dryland agriculture. Major crops in Benton County are wheat, corn, potatoes, apples, cherries, hops, mint, alfalfa hay, and wine grapes. Beef cattle are also raised in the County.

Of the overall study area, a small portion of Segment D and even smaller portions of Segments C, E, and F traverse through and terminate in Benton County. Segments C and D would cross both private lands and publicly administered lands. Segments E and F would only cross publicly administered lands.

S.3.7.4. Yakima County

Yakima County has leading industries in agriculture and related sectors. The location of agriculture has been strongly influenced by the construction of irrigation facilities. Cultivated agriculture in Yakima County is heavily concentrated in and around the valley floors, while grazing lands and most orchards are located along many of the hillsides.

Only Segment C would pass through Yakima county, on private lands as well as publicly administered lands.

S.3.7.5. Land Uses

Roughly 41 percent of the study area is located on privately owned land, which is characterized by open rangeland, agricultural land, open space, some rural residential, and a limited amount of quarrying.

The remaining 59 percent of the land in the study area is administered by seven public agencies. The public land areas crossed are under the administration of two Washington State agencies, Department of Natural Resources (DNR) and Washington Department of Fish and Wildlife (WDFW), and five federal agencies: Bureau of Land Management (BLM), Department of Defense (DOD), Bureau of Reclamation (BOR), U.S. Fish and Wildlife Service (USFWS), and Department of Energy (DOE).

Typical land uses on the publicly owned lands in the study area include predominantly rangeland, agricultural, wildlife habitat, recreation, and limited commercial, industrial, or transportation-related uses. The study area also includes crossing the BLM Saddle Mountain Management Area, the Saddle Mountain, Wahluke, and Columbia River Islands/Dunes Units of the Hanford Reach National Monument, Hanford Site, and Yakima Training Center.

S.3.8 Socioeconomics

For Your Information

The only portion of the project that crosses lands within Douglas County is the fiber optic line for roughly 5 miles. No socio-economic issues would arise and no impacts would occur since the fiber optic line would be installed on existing structures and construction equipment would use existing roads.

Agriculture is an important industry sector that influences local economies as well as demographic composition. Correspondingly, the booms and busts of agriculture dependent industries are reflected in population and economic growth of the area. Other industries important to the area include service, retail trade, and manufacturing sectors. Kittitas, Grant, Yakima, and Benton Counties, in general, are less racially diverse, have lower per capita and median household incomes, and have a lower percentage of income derived from work earnings than the state.

S.3.8.1. Population

The population within the study area is primarily located in sparsely populated rural areas. Public lands are predominantly uninhabited in the study area. Caucasians comprise 86 percent of Benton County, 77 percent of Grant County, 92 percent of Kittitas County, and 66 percent of Yakima County populations. Hispanic origin varies greatly across the area, ranging from 13 percent of Benton County, 30 percent of Grant County, 5 percent of Kittitas County, and 36 percent of Yakima County as compared to a statewide composition of 8 percent.

S.3.8.2. Economy

The service, retail trade, manufacturing, and agriculture sectors drive the central Washington economy in the private industry. Employment and income derived from government and government services also play a major role in the local economies. Kittitas County has the lowest median household income ($32.546) compared to $34.828 in Yakima County, $35, 276 in Grant County, and $47,044 in Benton County. All study area counties are lower that the state median household income of $45,776.

S.3.8.3. Employment

Agriculture is an important sector for Grant and Yakima Counties. Jobs in agriculture account for 17 percent of the wage earnings in Grant County and 14 percent of the wage earnings in Yakima County. Agriculture is less important in Benton County and Kittitas County (4 percent and 5 percent of the total earned wages, respectively).

S.3.9 Visual Resources

The study area's visual character and quality are primarily natural and rural, defined by rolling as well as steep and dramatic mountain ranges, consistent stretches of sagebrush and rabbitbrush, and agricultural uses including orchards, vineyards and ranches. Its visual character and quality are also defined by dispersed residential areas, existing transmission and generation facilities, the natural beauty of the Columbia River, and the way topography and vegetation relate to the sky and the changing patterns of light throughout the day and year. All of these factors contribute to the area's visual interest and perceived visual quality.

Four locations that are visually sensitive have been identified due to their visual quality, uniqueness, cultural significance, or ***viewer characteristics***. These areas include:

- **Viewpoint A**, the area near Colockum Pass, due to the number of residences with ***foreground*** views of the transmission line project;
- **Viewpoint B**, the north face of the Saddle Mountains near the Columbia River and Crab Creek, due to its unique and striking landform, relationship to adjacent water bodies and number of viewers on Route 243;

For Your Information

Viewer Characteristics

Low Visual Sensitivity: most motorists, who would see transmission lines at limited locations from roads that they traverse.

Moderate Visual Sensitivity: Some recreationalists, such as bird watchers, hikers and/or recreationalists whose activity is specific to a finite geographic location, who are sensitive to man-made structures and their impact on the view of the natural environment.

High Visual Sensitivity: Residential viewers who own property within 500 ft of the proposed corridors and are concerned about transmission structures and how they impact the view of the natural environment.

Foreground *views are those within 0.25 to 0.5 mile of the viewer.*

- **Viewpoint C**, the Saddle Mountain Ridgeline, due to its striking landform, recreational value, and potential impact from a ridgeline transmission line corridor placement; and
- **Viewpoint D**, the Vernita Bridge and Primitive Boat Launch Area, due to the number of recreationalists and potentially sensitive viewers, and the presence of natural water bodies and dramatic landforms.

S.3.10 Recreational Resources

Several resources have dedicated recreational activities. The John Wayne Trail is an abandoned railroad line ROW that has been converted to a multi-use trail extending 110 miles from North Bend, Washington to the Columbia River. Interpretive facilities are provided at the Wanapum Dam as part of the Native American Heritage Center and at the Dam Powerhouse and are considered dedicated recreational activities.

Other recreational activities within the study area are dispersed and include bird watching, boating, environmental education, falconry, field dog training, fishing, hang gliding, hiking, horseback riding, hunting, mountain biking, off-road vehicle use, paragliding, photography, primitive camping, rock hounding, sightseeing, snowmobiling, snowshoeing, water sports, and wildlife observation.

The Hanford Reach of the Columbia River was found suitable for inclusion in the National Wild and Scenic Rivers system. Recreation in the Hanford Reach National Monument is dispersed and dedicated. Activities include boating, sightseeing, hunting, hiking, wildlife observation, photography, fishing, and environmental education. However, the area lacks interpretive and service facilities typical of a national monument.

For Your Information

Cultural resources *are those historic and archaeological properties, properties of traditional and cultural significance, sacred sites, Native American human remains and associated objects, and cultural landscapes which are entitled to special consideration under federal statute, regulations, and/or executive orders.*

S.3.11 Cultural Resources and Historic Properties

The Columbia, Kittitas, Wanapam, Wenatchee, and Yakama peoples lived in the vicinity of the study area at the time of the Lewis and Clark expedition of the Snake and Columbia Rivers in 1805 en route to the Pacific (Ray 1936). Their life was focused on an annual round anchored by specific times for gathering, hunting, fishing, and trading, but also for religious activities, visiting, courting, storytelling, dancing, and other such activities.

A period of exploration and trapping followed, with early travelers such as Wilson P. Hunt of the Astor Company, David Thompson of the Northwest Company, Alexander Ross, Ross Cox, and many others arriving in this area between 1805 and 1815. Gold mining brought many Europeans, Euroamericans, and Chinese through the study area beginning around 1850, but it was ranching that kept them there. Transportation – particularly river crossings – provided the means for expansion and trading. Horse ranching and fruit farming increased in the latter half of the last century, but it was not until more efficient irrigation systems were organized around the turn of the century that fruit farming really became a major activity in this region.

S.3.11.1. Draft EIS Literature Review

A literature review was conducted for all of the alternatives and was summarized in the draft EIS. This review was performed by the Confederated Tribes of the Colville Reservation under contract to the BPA. The literature review indicated that 36-40 sensitive areas (currently recorded sites and unsurveyed areas that have a high probability for yielding significant cultural resources and historic properties) are located near each alternative, which covers approximately 7.2 to 8.3 sq mi. The actual presence or absence of significant or potentially significant cultural resources and historic properties along the Preferred Alternative would be determined through subsequent field surveys.

S.3.11.2. Survey Results for the Preferred Alternative (Alternative 2) Right-of-Way

A pedestrian survey was conducted for the entire length of the Preferred Alternative right-of-way (except for four small areas where access was denied to archaeologists by private landowners), access roads, and fiber optic line. The survey was conducted by Archaeological Frontiers under contract to the Yakama Indian Nation and BPA.

The results of the pedestrian survey along the right-of-way indicated that 47 prehistoric and 9 historic "newly identified" resources and properties are located within the Preferred Alternative's ***Area of Potential Effect (APE)***. Of these totals, 27 prehistoric and 3 historic resources are considered to be eligible or potentially eligible for listing on the NRHP.

In addition to the newly identified prehistoric and historic resources, attempts were made to field verify 15 previously recorded cultural resource sites. Nine of the 15 earlier recorded sites were found to lie within the APE; however, only seven (five are prehistoric and two are historic) were field verified during the pedestrian survey. Each of the seven previously recorded sites that were located again is considered potentially significant to the NRHP. Of the two sites that could not be relocated, the prehistoric site is also considered potentially significant.

For Your Information

All unsurveyed areas that have denied BPA access would be surveyed after BPA purchases the easements for the new line. These surveys would be completed before construction is begun.

*The **Area of Potential Effect (APE)** for this project is defined as the entire ROW for the length of the proposed transmission line, access roads, and fiber optic line.*

S.3.11.3. Survey Results for the Preferred Alternative (Alternative 2) Access Roads and Fiber Optic Line

Twenty-six prehistoric resources and one paleontological site were newly identified along Preferred Alternative's access roads and the fiber optic line. Sixteen newly identified prehistoric resources (15 sites and 1 resource) and 11 of the earlier identified prehistoric resources (10 sites and 1 resource) are considered to be potentially significant and eligible for inclusion to the NRHP. No newly or previously identified historic artifacts were located along the access roads or fiber optic line.

S.3.12 Public Health and Safety

For Your Information

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

Current *is the amount of electrical charge flowing through a conductor.*

Corona *is an electrical discharge, at the surface of a conductor.*

S.3.12.1. Electric and Magnetic Fields

Transmission lines, like all electrical devices and equipment, produce ***electric and magnetic fields*** (EMF). The voltage, or force that drives the ***current***, is the source of the electric field. The current, or movement of electrons in a wire, produces the magnetic field. The strength of magnetic field depends on the current, design of the line, and the distance from the line. Field strength decreases rapidly with distance.

There are currently no national standards in the United States for electric and magnetic fields from transmission lines. The state of Washington does not have limits for either electric or magnetic fields from transmission lines. The BPA has maximum allowable electric fields of 9-kV/m on the ROW and 5-kV/m at the edge of the ROW.

S.3.12.2. Noise

Transmission line noise – Audible noise can be produced by transmission line ***corona***. Corona-generated audible noise can be characterized as a hissing, crackling sound that under certain conditions is accompanied by a 120-Hz hum. The conductors of high-voltage transmission lines are designed to be corona-free under ideal conditions. However, a protrusion on the conductor surface – particularly water droplets on or dripping off the conductors – cause electric fields near the conductor surface to exceed corona onset levels, and corona occurs. Therefore, audible noise from transmission lines is generally a foul-weather (wet-conductor) phenomenon. However, during fair weather, insects and dust on the conductors can also serve as sources of corona.

Substation noise – Sound varies at the substation sites, as a result of weather and other factors such as background noise and the kind of equipment operating, and could be higher or lower on any given day or at any given time at these substations.

S.3.12.3. Radio and TV Interference

Corona on transmission line conductors can generate electromagnetic noise in the frequency bands used for radio and television signals. In rare circumstances, corona-generated ***electromagnetic interference (EMI)*** can also affect communication systems and sensitive receivers. Corona-caused television interference occurs during foul weather and is generally of concern only for conventional receivers within about 600 feet of a line. Cable and satellite television receivers are not affected.

For Your Information

Electromagnetic interference (EMI) *is high-frequency electrical noise that can cause radio and television interference.*

S.3.12.4. Toxic and Hazardous Materials

During construction, hazardous materials could be encountered anywhere along the proposed route and could include such things as illegally dumped waste, drug lab chemicals, spilled petroleum products, pesticides, and other wastes.

Minimal amounts of hazardous waste result from routine maintenance procedures performed on substation equipment and transmission lines. The type and volume of waste such as oily rags, minor leaks from vehicles, etc., depend on maintenance procedures.

S.3.12.5. Fire

Numerous wildfires have occurred on private and public land in and around the proposed routes over the past several years. They may have been caused by human actions such as vehicle ignitions from roads, unattended campfires, burning of adjacent agricultural lands and arson, or by natural causes such as lightning.

S.3.13 Air Quality

In the four counties where the study area is located, two local clean air authorities and two regional WDOE offices work together to control, monitor, and prevent air pollution:

- Benton Clean Air Authority: Benton County
- Yakima Regional Clean Air Authority: Yakima County
- Washington State Dept. of Ecology Central Regional Office: Kittitas County
- Washington State Dept. of Ecology Eastern Regional Office: Grant County

There are no nonattainment areas designated by the EPA or Class 1 areas designated by Section 160 of the Clean Air Act in the study area.

S.4 Impacts

➡ **For Your Information**

Mitigation *describes measures that could be taken to lessen the impacts predicted for each resource. These measures may include reducing or minimizing a specific impact, avoiding it completely, or rectifying or compensating for the impact.*

Cumulative impacts *are created by the incremental effect of a specific action when added to other past, present, or reasonably foreseeable future actions.*

Section 303(d) streams, *as defined by the Federal Clean Water Act, are water quality limited streams that fall short of state surface water quality standards and are not expected to improve within the next four years.*

To analyze potential impacts for construction, operation, and maintenance activities, resource specialists have analyzed actions using a scale with four impact levels: high, moderate, low, and no impact. Impact discussions include recommended ***mitigation*** that could reduce both the direct, indirect, and ***cumulative impacts*** of the proposed alternatives.

S.4.1 Water Resources & Soils and Geology

Common to all alternatives, including the fiber optic lines, are the following impacts: sedimentation would be of short duration during construction with potential stream turbidity occurring in the short-term; no impacts to aquifers would result; and impacts to ***303(d) streams*** would not alter those parameters for which they are listed.

The **Preferred Alternative, Alternative 1 and Alternative 1A** would have **low to moderate** impacts that result from the abovementioned common impacts.

Alternative 3, in addition to the common impacts, would also have greater sedimentation and turbidity impacts. This is due to the larger quantity of new access roads that would be constructed. Overall impact to water resources and soils and geology: **moderate**.

For the **No Action Alternative,** ongoing maintenance of existing lines would cause **no to low** impacts to water resources, soils and geology.

S.4.2 Floodplains and Wetlands

Floodplains within the study area may be directly impacted by the placement of structures in several locations. It is not expected that constructing access roads to these structures would impact floodplains, because these new roads would not alter the amount of flood storage or the course that flood waters would take.

Most of the wetlands within the study area are not extensive, and would be spanned by structures placed in upland areas adjacent to wetlands. Roads and culvert crossings would be designed to minimize, but not completely avoid impacts to wetland areas.

The ongoing maintenance of transmission lines and access roads could impact wetlands through removing trees in wetlands, road grading and the inadvertent spread of noxious weeds.

The **Preferred Alternative** would affect 7 wetlands and 2 floodplains. The wetlands would receive low to moderate impacts due to tree removal, construction of one structure, and road construction. Floodplain construction would involve constructing a new access road in the Dry Creek floodplain and a tower and new access road in Wilson/Naneum Creek floodplain. The overall impact to floodplains and wetlands: **moderate**.

Alternative 1 would affect approximately 12 wetlands and one floodplain. Floodplain construction would involve constructing a new access road in the Wilson/Naneum Creek floodplain. Overall impact to floodplains and wetlands: **moderate**.

Alternative 3 would affect approximately 18 wetlands and 2 floodplains. Floodplain construction would involve constructing a new access road in the Dry Creek floodplain and a tower and new access road in Wilson/Naneum Creek floodplain. Overall impact to floodplains and wetlands: **moderate**.

Alternative 1A would affect approximately 11 wetlands and one floodplain. Floodplain construction would involve constructing a new access road in the Wilson/Naneum Creek floodplain. Overall impact to floodplains and wetlands: **moderate**.

No Action Alternative would cause **no** impacts on floodplains and wetlands.

S.4.3 Vegetation

In general, shrub-steppe plant communities are slow to recover from disturbance. Some construction-related impacts would be temporary. Although the aboveground portion of shrubs would be broken or crushed by heavy machinery maneuvers, the roots and soils would not be disturbed, and vegetation would eventually return to pre-disturbance conditions.

The construction or replacement of structures would require vegetation removal and would compact soils. Construction of structures on ridges can decrease slope stability, which can lead to degradation of plant communities on the slope and in the riparian area. Vegetation would also be impacted by the disturbance of biological crusts, which would decrease soil fertility and increases the likelihood that an area would be invaded by non-native species. The removal of vegetation along waterways causes an increase in water temperature, increases water velocity, and decreases wildlife habitat. Disturbance of soil in or near riparian areas may lead to erosion of stream banks, which increases the deposition of sediment into waterways.

Fragmentation of some plant communities, especially shrub-steppe, by construction of roads and other disturbance can lead to a loss of biodiversity and reduction in overall plant community health and quality. As plant communities become smaller and more fragmented, they become more susceptible to outside influences such as invasive weed species. They also become less able to sustain themselves because many plant species have limited seed dispersal ability so recolonization of disturbed areas may take many years or not occur at all due to competition from other species.

The construction of access roads would involve clearing vegetation. Impacts in the area of the finished roadbed and shoulder would be permanent.

Rare plant species and associated habitat may be directly or indirectly impacted by construction activities. Specific rare plants that may be affected are described below for each alternative.

After disturbance, bare land would likely be invaded by non-native species. The introduction and spread of noxious weeds would impact native vegetation reestablishment after the construction disturbance. Mitigation would be employed to avoid or minimize impacts to these species.

The **Preferred Alternative** would potentially affect habitat for two high-quality plant communities designated by the WNHP: Wyoming big sagebrush/bluebunch wheatgrass and bitterbrush/Indian ricegrass. Although no federally listed species are known to occur in the proposed ROW, potential habitat does occur in or near the ROW. There are no known occurrences of federally listed or candidate species along the fiber optic line. Overall impact to vegetation: **moderate to high**.

Alternative 1 would potentially affect two high-quality plant communities designated by the WNHP: Wyoming big sagebrush/bluebunch wheatgrass and bitterbrush/Indian ricegrass. Although no federally listed species are known to occur in the proposed ROW, potential habitat does occur in or near the ROW. There are no known occurrences of federally listed or candidate species along the fiber optic line. Overall impact to vegetation: **moderate**.

Alternative 3 would potentially affect one high-quality plant communities designated by the WNHP. A large amount of high quality shrub-steppe would be removed. Overall impact to vegetation: **high**.

Alternative 1A would potentially affect two high-quality plant communities designated by the WNHP: Wyoming big sagebrush/bluebunch wheatgrass and bitterbrush/Indian ricegrass.

Although no federally listed species are known to occur in the proposed ROW, potential habitat does occur in or near the ROW. There are no known occurrences of federally listed or candidate species along the fiber optic line. Known occurrences of the BLM special status species, Hoover's desert-parsley and dwarf evening primrose are in the immediate vicinity (within 500 feet) of Segment F and could be impacted by project activities. Overall impact to vegetation: **moderate to high**.

No Action Alternative would cause **no** impact on vegetation and rare plants.

S.4.4 Wildlife

Clearing areas of native shrub-steppe vegetation can increase the risk of predation for shrub-steppe dependant small mammal, reptile and bird species. In areas of undisturbed, native shrub-steppe habitat, clearing would constitute a high impact, because high-value habitat for state or federally listed shrub-steppe-dependant species (e.g., sage sparrows, sage thrashers and loggerhead shrikes) would be reduced. In areas of degraded shrub-steppe vegetation (e.g., vegetation infested with weed species), clearing would constitute a moderate impact, since the habitat is already degraded. Clearing in areas previously cleared or severely disturbed (such as agricultural lands) would result in minimal impacts to wildlife species.

Since the proposed transmission line would either span riparian areas or would be located upslope of stream channels, in most areas little or no riparian vegetation would need to be removed for transmission line clearance and tower construction. However, since riparian areas are extremely important wildlife habitat, clearing riparian vegetation for ROW or access road construction would cause moderate to high impacts to wildlife species, by disrupting movement corridors, removing nesting or foraging habitat, and compacting stream banks. Only Cooke, Coleman and Wilson Creeks would require riparian vegetation removal. Approximately 35 cottonwood trees would be removed at Cooke Creek, a high impact, while four cottonwoods would be removed at Wilson Creek, also a high impact, and two small cottonwoods at Coleman Creek, a moderate impact.

Mitigation for disturbance such as construction timing restrictions, placing markers on transmission lines or ground wires to reduce avian collisions, minimizing areas of disturbance and appropriate revegetation of disturbed areas would reduce overall impacts to wildlife species.

The **Preferred Alternative** has moderately disturbed shrub-steppe habitat on Segments A and B_{SOUTH} and D. Overall impacts to wildlife and habitat: **moderate to high**.

Alternative 1 has the same habitat areas on Segments A and B as the Preferred Alternative. Segment E is mostly disturbed agricultural area with low habitat value, except for the Hanford area, which is high quality, undisturbed shrub-steppe habitat. Overall impacts to wildlife and habitat: **moderate**.

Alternative 3 has the same habitat areas on Segment A as the Preferred Alternative. Existing habitat on Segment C is relative undisturbed and of high quality, especially on the YTC. Segment C has core sage grouse areas. Overall impacts to wildlife and habitat: **high**.

Alternative 1A has the same habitat areas on Segments A and B as the Preferred Alternative. Segment F along the Saddle Mountains is high elevation and has sensitive habitat this is relatively undisturbed. The Hanford area on Segment F is relatively undisturbed shrub-steppe habitat of high quality. Overall impacts to wildlife and habitat: **high**.

No Action Alternative would cause **no** impact on wildlife.

S.4.5 Fish Resources

Short-term construction disturbances, depending on the time of year and the location, could impact various fish species by causing sedimentation, habitat and/or individual fish disturbance, or the release of hazardous materials into a waterway. However, since most of the project construction will occur away from streams and include mitigation (such as construction timing restrictions and spill prevention and erosion measures), short-term construction-related disturbances should result in low or no impacts to all fish species.

Long-term impacts resulting from operation and maintenance could result mostly from habitat alteration due to clearing of riparian vegetation, changes in runoff and infiltration patterns (from upland vegetation clearing), sedimentation from cleared areas, and maintenance access across streams.

The **Preferred Alternative** would cross 9 fish bearing streams. Segment A would cross streams that may contain Middle Columbia River steelhead trout and bull trout. Neither species are known to currently occur in the reaches of these streams where the project crosses although steelhead are present in the lowest reaches of some streams. Upper Columbia River steelhead trout are present in the lower reaches of two streams spanned by Segments B and D, but not where the project crosses them. Chinook salmon, Bull trout, and Upper Columbia River steelhead trout are present in the Columbia River, and could thus be impacted by Segments B and D. Overall impact to fish resources: **none to low**.

Alternative 1 would cross 12 fish bearing streams. It shares the same impacts as the Preferred Alternative on Segments A and B. Segment E would also span the Columbia River where Chinook salmon, Bull trout, and Upper Columbia River steelhead trout are present. Overall impact to fish resources: **none to low**.

Alternative 3 would cross 11 fish bearing streams. It shares the same impacts as the Preferred Alternative on Segment A. Upper Columbia River steelhead trout are present in the lower reaches of two streams spanned by Segment C. Overall impact to fish resources: **low to moderate**.

Alternative 1A would cross 11 fish bearing streams. It shares the same impacts as the Preferred Alternative on Segments A and B. Segment F would also span the Columbia River where Chinook salmon, Bull trout, and Upper Columbia River steelhead trout are present. Overall impact to fish resources: **none to low**.

No Action Alternative would cause **no** impact on fish resources.

S.4.6 Land Use Impacts

Common to all the alternatives, the following activities and associated impacts would occur to existing land uses:

- Heavy machinery used for construction would temporarily damage crops, compact soils, and disrupt land use activities on approximately 0.3 acre around each structure.
- To construct and maintain the proposed transmission line, some existing access roads would need to be improved and new access roads would need to be constructed.
- The area that would become new ROW would have limitations on the types of crops that may be located under the transmission lines.
- Activities such as grazing and the movement of livestock would be able to continue around the towers, underneath the transmission lines, and over any necessary access roads.
- The disturbance associated with the fiber optic line would be temporary and the landowners would be compensated for the use of their land; therefore land use impacts would be low.

Overhead transmission lines represent a hazard to low-flying aircraft such as those used in the military training exercises conducted at the Yakima Training Center. Overhead transmission towers and conductors would pose a hazard and affect the ability to operate the low flying aircraft. The towers and conductors would also affect the parachute drops used to bring in supplies during maneuvers. To reduce the profile of the proposed line where it crosses the YTC, the proposed towers and conductors in the YTC will be at a lower height above ground than elsewhere along the route. In the YTC standard airway marker balls would be installed on the overhead ground wires to enhance visibility of the conductors.

The **Preferred Alternative** would allow existing grazing uses to continue. On Segment A of this alternative, land use impacts to residential housing and quarry activities would be moderate to high. On Segment B as the line crosses the YTC, military maneuvers would continue under similar circumstances to the existing condition, a low to moderate impact. On Segment D, by using existing structures and double-circuiting where the line crosses irrigated farmlands, impacts to agricultural land use activities would be moderate. In areas designated for preservation, impacts would be <u>high </u>due to <u>a loss and degradation of wildlife habitat, increased habitat fragmentation, and increased human disturbance to wildlife</u>. Overall land use impact: **moderate to high**.

Alternative 1 would have the same impacts as the Preferred Alternative on Segments A and B. On Segment E, however, impacts to agricultural activities would be high. In addition, this alternative crosses the Columbia National Wildlife Refuge and an area designated as preservation land on the Hanford Reach National Monument. Impacts to preservation efforts would be high. BLM-administered lands crossed is primarily used for rangeland and wildlife habitat<u> with some recreational use</u>, associated land use impacts would be low. Overall land use impact: **high**.

Alternative 3 would have the same impacts as the Preferred Alternative along Segment A. Segment C is primarily located on the YTC and would not be adjacent to other transmission lines. A new line would eliminate the ability to perform military training, aviation, ground maneuvers that currently occur in this area, which would be a high impact. Overall land use impact: **high**.

Alternative 1A would have the same impacts as the Preferred Alternative along Segments A and B. Approximately 40 percent of Segment F would be a new utility corridor on BLM-administered lands. Impacts to mineral resources, rangelands, recreation and wildlife habitat on these lands would be low. In addition, this alternative crosses an area designated as preservation land on the

Hanford Reach National Monument. Impacts to preservation efforts would be high. Overall land use impact: **moderate to high**.

No Action Alternative would cause **no** impact on land use.

S.4.7 Socioeconomics

No impacts to local populations, including minority and low-income groups, are expected to occur. A small positive impact to local economies and sales tax revenues would result from construction-related jobs and expenditures. Two residences would be relocated as a result of the Preferred Alternative, which would be a negative impact. Decreases in property tax revenues would occur from the purchase of land by BPA to locate the new substation for the Preferred Alternative and Alternative 3. The new line is not expected to cause overall long-term adverse effects on property values.

All construction Alternatives would have **minimal** impacts, both positive and negative, on socioeconomics in the study area.

No Action Alternative may have negative impacts to the greater region, as a result of the lack of adequate transmission capacity to support expected growth in the Northwest.

S.4.8 Visual Resource

Transmission line facilities would be seen from a variety of potential viewpoints along all of the proposed routes, including private residences, highways, and recreation areas. Common to all alternatives is fiber optic installation. Since the towers and conductors already exist in the landscape, the addition of a smaller diameter fiber optic cable to these structures would be largely unnoticeable from existing conditions. Impacts to visually sensitive areas are discussed for each alternative.

The **Preferred Alternative** would pass near residences on Segment A, but would not dominate the view. On Segment B_{SOUTH}, the line would be visible to users of the John Wayne Trail, however, other transmission lines are visible from the trail. On Segment D, the line would be clearly visible to residents, tourists, and recreationists in the Saddle Mountain area and at the Columbia River west of the Vernita Bridge. Overall visual impact: **low to moderate**.

Alternative 1 would have the same impacts as the Preferred Alternative on Segments A and B. On Segment E, a new line in the Saddle Mountains would be slightly further away from most viewers. Overall visual impact: **low to moderate**.

Alternative 3 would have the same impacts along Segment A as in the Preferred Alternative. No visually sensitive areas were identified along Segment C. Overall visual impact: **low to moderate**.

Alternative 1A would have the same impacts along Segments A and B as in the Preferred Alternative. Segment F would cross the north face of the Saddle Mountains furthest from most viewers. Overall visual impact: **low to moderate**.

No Action Alternative would cause **no** impact on visual resources.

S.4.9 Recreational Resource

All of the alternatives would have temporary impacts related to construction. For safety reasons, during construction, recreation would not be allowed within the construction area. This could result in a temporary closure of existing access roads and trails and, consequently, temporarily limit access to some recreation areas. During conductor and fiber optic stringing, activities such as sightseeing, watersports, and boating would be limited in the construction area.

All alternatives would cross the Iron Horse State Park portion of the John Wayne Trail at least once while crossing the YTC. If construction was conducted during the peak use periods, and they would be low if conducted during the off-peak use periods.

All construction Alternatives would have a **low** impact on recreational activities.

No Action Alternative would cause **no** impact on recreation.

S.4.10 Cultural Resources and Historic Properties

Any ground-disturbing activity within the boundaries of a cultural resource or significant historic property could be destructive, resulting in the permanent, irreversible, and irretrievable loss of scientific information and/or cultural value. Ground disturbance activities associated with construction include clearing vegetation, grading and backfilling, using heavy equipment, constructing structures, and constructing access roads.

Non-ground-disturbing activities, such as acquiring new right-of-way, cutting vegetation, reseeding, changing access and use, and ongoing operations and maintenance may or may not have negative impacts on cultural resources or historic properties depending on the type of resource or property involved and the proximity of the activity to the resource or property.

The **Preferred Alternative** would avoid site-specific impacts to potentially significant properties by locating structures and access roads outside of known cultural resource and historic property boundaries. New cultural resources and historic properties could be discovered during construction.

Pedestrian surveys were conducted only for the Preferred Alternative, including access roads, ROW, and the fiber optic line. If an alternative other than the Preferred Alternative is chosen, further surveys would need to be conducted to identify potentially significant historic properties as well as site-specific avoidance and mitigation strategies.

No Action Alternative would cause **no** impact on cultural resources.

S.4.11 Public Health and Safety

All alternatives would have similar impacts to public health and safety. The BPA designs and operates transmission lines in compliance with NESC standards in order to minimize the impacts of EMF and safety hazards. Mitigation will be employed during construction, operation and maintenance activities to minimize radio/TV interference, impacts due to toxic and hazardous materials, and fire danger. Noise related to construction will comply with audible noise regulations. Transmission line and substation noise may increase during foul weather, which is typically of short duration.

The **Preferred Alternative** would have low to moderate impacts on public health and safety on Segments A and B, and moderate impacts on Segment D. Overall impacts to health and safety would be **low to moderate**. Impacts to noise would be **low**.

Alternative 1 would have low to moderate impacts on public health and safety on Segments A and B and moderate impacts on Segment E. Overall impacts to health and safety would be **low to moderate**. Impacts to noise would be **low**.

Alternative 3 and **Alternative 1A** would have **low** impacts on public health and safety. These alternatives would also have **low** impacts on noise.

No Action Alternative would cause **no** impact on public health and safety and **no** impact on noise.

S.4.12 Air Quality

On all of the proposed routes, construction vehicles and windblown dust from the construction sites would create short-term impacts.

Emissions would be short-term and would have low or no impact on air quality. No long-term impacts would occur.

All Alternatives, including the No Action Alternative, would have **no** impact to air quality.

Chapter 1 — Purpose and Need

In this Chapter:

- **Purpose and Need for Action**
- **Scoping and Major Issues**
- **Cooperating Agencies**
- **Decisions to be Made**

The ***Bonneville Power Administration (BPA)****, a federal agency within the Department of Energy, owns and operates over 15,000 circuit miles of transmission lines throughout the Northwest. BPA sells power to large direct service industries (***DSI***s) and to utilities that provide electricity for homes, businesses, and farms in the Pacific Northwest. BPA also uses the transmission system to provide power to regions outside the Northwest, such as Canada and California.

This chapter explains a problem or need that exists in central Washington on BPA's ***transmission system***. It describes conditions that have come together to create this need, and identifies the agencies that are working together to find a solution.

1.1 Need For Action

BPA owns and operates a system of transmission lines that move electricity through central Washington. Since the mid-1990's, the transmission lines that move electricity in a north-to-south direction on the east side of the Cascades, north of the U.S. Department of Energy Hanford Reservation (Hanford Site), have grown increasingly constrained. During spring and early summer months, the amount of power that needs to move through this area exceeds the carrying capacity of the existing transmission lines. Not having enough ***transmission capacity*** can compromise safety and decrease transmission ***system reliability***.

In the event of an ***outage***, additional power cannot be moved through the existing transmission system because the lines would overheat and sag below acceptable levels potentially causing fires and further equipment failure. This can lead to ***brownouts*** or, under certain conditions, a ***blackout***. Therefore, BPA needs to increase transmission capacity ***north of Hanford*** to move additional power through this area.

For Your Information

Words and acronyms in bold are defined in Chapter 10, **Glossary and Acronyms. Some are also defined in sidebars.*

*The **transmission system** includes 115-, 230-, and 500-kilovolt transmission lines. A kilovolt is one thousand volts.*

***Transmission capacity** refers to the maximum load that a transmission line or network of transmission lines can carry.*

***System reliability** is the ability of a power system to provide uninterrupted service.*

*A transmission line that is not in service, either planned or unplanned, is called an **outage**.*

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

*A **blackout** is the disconnection of the source of electricity from all electrical loads in a certain geographical area.*

*For a general location of "**north of Hanford**," see* Map 1, *BPA Transmission System.*

1.2 Purpose

Purposes are goals to be achieved while meeting the need for the project. They are used to evaluate project alternatives. BPA will use the following purposes to choose among the alternatives:

- Maintain transmission system reliability;
- Optimize transmission system usage;
- Minimize environmental impacts;
- Minimize costs; and
- Meet ***energization date*** of late 2004.

For Your Information

By optimizing transmission system usage, congestion is relieved on constrained transmission paths, thereby delaying transmission reinforcement.

*The **energization date** is when the project has been built and is operational.*

In order to meet the requirements of the 2000 Biological Opinion, BPA needs to plan and construct a project in the Hanford area by 2004 or 2005.

Investments included cost-effective measures such as remedial action schemes; automatic measures like generation and/or load dropping that ensure acceptable transmission system performance.

***Regional power transfers** are the exchange of electricity between the Pacific Northwest and California or Canada when one region has a surplus of energy and demand is high in another.*

***Spring run-off** refers to water from the snow melting in the spring that adds to the amount of water flowing in the Columbia River.*

*In the process of **spilling** water, dam gates are opened and water flows out. The water does not go through the turbines, which could injure fish.*

1.3 Background

BPA has limited transmission capacity north of Hanford primarily because of two reasons:

- Wholesale power deregulation; and
- Obligations to threatened and endangered species (fish).

Wholesale power deregulation started in 1992, causing BPA to cut costs in many ways in order to stay competitive in an open market. BPA had not built any major transmission lines since the mid-1980's, and this continued after deregulation. Investments in the transmission system (including maintenance) were small, inexpensive, and quickly energized compared to building expensive transmission lines. This allowed BPA to squeeze more performance out of the existing transmission system and continue to meet growing load. Over the past five years, there has been an increase in the usage of the transmission system due to an increase in ***regional power transfers***. The increased transmission usage in the Northwest has outrun the capacity of the existing transmission system.

Since the early 1990's, 12 distinct populations of salmon species have been listed as threatened or endangered under the Endangered Species Act (**ESA**) within the northwestern United States. Federal agencies that operate the dams in the Northwest are required to take specific actions to help salmon survive. During the ***spring run-off***, water in the Lower Snake and Columbia Rivers that had previously been used to generate electricity at dams (Lower Granite to Bonneville – see Map 1, *BPA Transmission System*) is now used to help transport juvenile salmon down river to the ocean. ***Spilling*** water over these dams causes less water to go through the turbines which results in less power being generated. To make up for the loss of generation, dams along the mid- and upper-Columbia River in northern Washington (e.g., Grand Coulee and Chief Joe – see Map 1, *BPA Transmission System)*, need to generate additional power to meet market demands during the spring and summer months. This is in addition to power coming from Canada.

As electricity is generated at the mid- and upper-Columbia River dams, it moves south through central Washington to load centers like Portland and Seattle, and to the ***Southern Intertie***. It also flows west over the Cascade Mountains and then south through the Seattle area. (See Map 1, *BPA Transmission System*). The transmission capacity across the north of Hanford area cannot accommodate the amount of electricity needing to flow through the area to the south.

For Your Information

*The **Southern Intertie** is a collective group of transmission lines that move power north and south between Oregon and California.*

1.4 Finding Solutions

After identifying existing and future electrical needs in the area, BPA began to develop transmission alternatives to meet the need. BPA did 6-year studies to determine what actions could meet the need, what each would cost, and how each could affect the transmission system.

This ***Environmental Impact Statement (EIS)*** refines these actions or alternatives based on comments from agencies and the public. It identifies the environmental resources that could be affected, and discloses the potential impacts to the resources associated with these alternatives. Chapter 2, *Alternatives*, describes the alternatives.

*An **EIS** is a document that discloses the environmental impacts of a proposed action and alternatives.*

1.5 Scoping and Major Issues

Scoping refers to a time early in a project when the public has an opportunity to express which issues and concerns should be considered in an EIS. On November 9, 2000, BPA published a ***Notice of Intent*** **(NOI)** to prepare an EIS and conduct public scoping meetings for the proposed project. A letter was sent to the public on December 12, 2000, explaining the proposal, the environmental process, and how to participate. A comment sheet was included to enable individuals to mail comments back to BPA. An e-mail address was also given to enable people to comment by e-mail. Project scoping meetings were held in Desert Aire, Yakima, and Ellensburg, Washington. Written and verbal comments were collected during scoping.

*The **Notice of Intent (NOI)** for this project was included in the Federal Register (65 FR 77352), which publishes regulations and legal notices issued by federal agencies.*

A second project mailing went to the public on March 26, 2001. This letter updated interested parties on the progress of the project and the information gathered during the scoping process. Many issues were raised during the scoping process, and most of the comments received focused on the following issues:

- Potential environmental impacts, including impacts to residential land and property values;
- Proposed alternatives and how the line would be designed;
- Agricultural land impacts; and
- The need for the project, and the agencies that BPA should coordinate with during the process.

Environmental specialists took the comments received during the scoping period into consideration, while developing the environmental impact analyses. Issues raised during scoping and additional concerns are addressed in Chapter 4, *Environmental Consequences*.

On June 6, 2001, a third letter was mailed to landowners along a new route located in the Saddle Mountain area east of Vantage. Members of the public who attended the scoping meetings proposed a route in this general area. BPA personnel took a closer look and developed a route, which is discussed in the next chapter.

A fourth letter was mailed on July 30, 2001. This letter identified BPA's Preferred Alternative and the reasoning behind the choice.

Copies of the public mailings are included in Appendix A, *Public Involvement*.

1.6 Draft EIS Public Comment Period

The Draft EIS (DEIS) was made available to the public on February 8, 2002. 251 copies of the DEIS were mailed to interested members of the public. 99 copies of the summary were also mailed. Comments on the DEIS were collected at public meetings held in Desert Aire, Ellensburg, and Richland, Washington. Comments were also received via phone, mail, and e-mail. The comment period ended on March 25, 2002.

A follow-up letter was sent to people interested in the project on April 15, 2002, which is included in Appendix A, *Public Involvement*. The letter identified the focus of comments received during the comment period and notified people of environmental and project design activities that would be occurring in the project area.

Chapter 6 in this document consists of comments received on the DEIS as well as BPA responses. This Final EIS (FEIS) provides updated information based on comments received as well as additional information that has become available. Additions to the document are displayed with underlined text.

1.7 Cooperating Agencies

When a project could involve more than one federal agency, those agencies often work together during the planning and decision-making process. BPA is the lead federal agency on this project and supervises the preparation of the EIS. BPA has invited the following agencies to cooperate in the EIS process, because the proposed project potentially crosses land managed by these agencies:

- U.S. Department of Defense
  Department of Army (USDOA)
- U.S. Department of Interior
  Bureau of Land Management (BLM)
  Bureau of Reclamation (BOR)
  Fish and Wildlife Service (USFWS)

The project also potentially crosses the Hanford Site, which is owned and partially managed by the U.S. Department of Energy (USDOE). Since BPA is also part of the USDOE, the Richland Operations Office (RL) has been asked to make joint decisions with BPA rather than being a cooperating agency.

1.8 Decisions to be Made

A project of this size involves different alternatives and options for decision-makers to consider. The following kinds of decisions must be made by the federal agencies involved:

- BPA must first choose an alternative. If the alternative is to build a new transmission line, BPA must decide which route, and which substation would be the end point. BPA must further define the location of the new right-of-way (ROW), where structures and access roads would be placed, and the types of structures to be used.
- The USDOA must decide if the project complies with the current management plan of the Yakima Training Center (YTC).
- The BLM must decide whether the project complies with their currently approved management plan; and whether a Right-of-Way Grant or easement would be needed for construction, operation, and maintenance of project facilities.
- The BOR must decide if the project meets the conditions of the longstanding Memorandum of Understanding with BPA to allow the crossing of BOR land and waterways.

- The USFWS must decide if the project is compatible with the current management objectives for the Columbia National Wildlife Refuge. The USFWS must also decide if the project complies with the management objectives of the Hanford Reach National Monument and the presidential proclamation establishing the National Monument.
- The USDOE has two decisions to make:
  - Whether the project complies with management plans for the Hanford Site.
  - Whether the project complies with the management objectives of the Hanford Reach National Monument, which includes the Saddle Mountain Unit. This decision must be made in conjunction with the USFWS.

More information about federal, state, and local consultations and permits for this project is included in Chapter 5, *Consultation, Permit, and Review Requirements*.

1.9 Other Projects in the Area

McNary-John Day Transmission Line Project – BPA signed a Record of Decision (ROD) in October 2002. Minor construction will occur in 2003. The transmission line would be built once financing is secured, which is estimated to occur in the next one to five years.

Starbuck Power Project – Work on this project was suspended in March 2002.

Stateline Wind Project – This project has been constructed.

For Your Information

A ***megawatt (MW)*** *is one million watts, or one thousand kilowatts.*

Wallula Power Project – Newport Northwest, LLC is proposing to construct and operate a 1,300-MW natural gas combined-cycle combustion turbine at Wallula, Washington, in Walla Walla County. A DEIS was issued in March 2002 and an FEIS in August 2002. BPA is currently awaiting approval from the governor of Washington state before writing a Record of Decision.

Maiden Wind Project – Washington Winds, Inc. is developing a wind farm in the Rattlesnake Hills area. It would produce a maximum of 400 MW of electricity. The project would connect to existing BPA transmission lines via a new substation. A DEIS was issued in March 2002 and an FEIS in December 2002.

Nine Canyon Wind Project – This project has been constructed.

Horse Heaven Hills – Washington Winds, Inc. is proposing to construct and operate a 225-MW wind farm in Benton County, Washington. A new substation and transmission line would be built to connect to the existing transmission system. Scoping was held in 2001, the project is currently on hold.

Grand Coulee-Bell Transmission Line – BPA is proposing to replace about 84 miles of existing 115-kV wood pole transmission line with a new, higher capacity 500-kV steel lattice line in Douglas, Grant, Lincoln, and Spokane Counties, Washington. The proposed line would connect BPA's existing Bell Substation in Spokane to BOR's existing switchyard at Grand Coulee Dam. The new line would be located primarily on existing BPA right-of-way. A DEIS was issued in August 2002, an FEIS was issued December 2002, and an ROD is expected in January 2003.

Plymouth Generation Facility – Plymouth Energy, LLC is proposing to construct and operate a 307-MW combined-cycle generation facility approximately 2 miles west of the town of Plymouth, Washington. A transmission line less than 1 mile long would be built to interconnect with the BPA system. A DEIS was issued in September 2002, an FEIS is expected in winter of 2003.

1.10 Organization of the Final EIS

This EIS includes information necessary for agency officials to make decisions based on the environmental consequences of proposed actions. Federal regulations specify the kinds of information decision-makers should have in order to make good decisions. This document follows those recommendations.

This Final EIS also provides updated information developed based on comments received on the Draft EIS as well as additional information that has become available. Additions to the document are displayed as underlined text.

Chapter 1 states the purpose and need for the project. Alternatives are evaluated based on the purpose and need for the project.

Chapter 2 describes the agency Preferred Alternative and other alternatives, including taking no action, and summarizes the differences between the alternatives.

Chapter 3 describes the existing environment within the study area of the project. Resources described include both natural and human resources.

Chapter 4 analyzes the possible environmental consequences of the alternatives. Impact rankings range from no impact to high impact.

Chapter 5 lists the licenses, permits, and other approvals or conditions the alternatives must obtain or meet.

Chapter 6 contains the comments on the DEIS, and BPA's responses to these comments.

Chapter 7 includes a list of the individuals who helped prepare the EIS.

Chapter 8 lists the individuals, organizations, and agencies who will receive copies of the EIS.

Chapter 9 provides a list of the references used in preparing the EIS.

Chapter 10 includes a Glossary of Terms and List of Acronyms used in the EIS.

Chapter 11 is an Index.

Supporting technical information is provided in the appendices.

Chapter 2 — Alternatives

In this Chapter:

- **Segments**
- **Agency Preferred Alternative**
- **Other Construction Alternatives**
- **No Action Alternative**
- **Alternatives Eliminated from Detailed Consideration**
- **Comparison of Alternatives and Summary of Impacts**

BPA studied ways to relieve constraints on the transmission system in central Washington. Four construction alternatives were developed, all of which involve constructing a new transmission line. The alternatives are divided into segments for ease in analysis and are shown on Map 2, *Alternatives*. Segment A is common to all construction alternatives. Segment B has two route options (B_{NORTH} and B_{SOUTH}), which begin and end at the same points. The remaining segments are C, D, E, and F.

For Your Information

Construction alternatives include the Preferred Alternative and Alternatives 1, 3, and 1a. Alternatives are made up of Segments A through F.

This chapter describes the segments and alternatives, summarizes how environmental consequences would differ among them, and compares the alternatives against the purposes of the project. BPA has identified a preferred alternative that best meets the purpose and need for the project.

This chapter also describes other alternatives (e.g., burying transmission lines) that were briefly studied and eliminated from detailed consideration for technical or economic reasons.

2.1 Segments

The following is a description of Segments A through F. (See Map 2, *Alternatives*.)

2.1.1 Segment A

Common to all alternatives, Segment A starts at BPA's Schultz Substation and goes southeast, following the existing Vantage–Schultz 500-kV transmission line. BPA plans to redesign the existing lines that currently exit the Schultz Substation to the east, to make room for the new line and improve the configuration of the existing lines. This redesign is referred to as the Sickler-Schultz Reroute. Figure 2.1, *Sickler-Schultz Reroute,* shows the Schultz Substation area. BPA

For Your Information

*A **bay** is an area set aside in a substation for special equipment.*

The decision of whether to use Option 1 or 2 of the Sickler-Schultz Reroute would depend on negotiations with the landowners.

Since the DEIS, BPA determined that the existing structures on the Schultz-Vantage line between the substation and Naneum Crossing would not be able to support the new conductor and would have to be replaced.

would relocate the first mile of the existing Sickler-Schultz 500-kV transmission line from its current location, to a new ***bay*** on the north side of the substation.

From the substation, the Sickler-Schultz Reroute would head northeast along one of two optional routes for approximately 1 mile to intersect with the existing Rocky Reach–Maple Valley 345-kV line. (See Figure 2.1, *Sickler-Schultz Reroute*.) The two options are approximately 1,200 feet apart on the south side and converge to the same tower on the north. The second option was developed in response to landowner concerns. It would require one more tower. From the tower where the two options converge, the line would follow the Rocky Reach–Maple Valley line for approximately 1.5 miles to the northeast. At this point, the relocated Sickler-Schultz line would reconnect with the existing Sickler-Schultz line and continue to the northeast.

The existing Schultz-Vantage 500-kV line from Schultz Substation to the Naneum Crossing would be rebuilt. (See Figure 2.1, *Sickler-Schultz Reroute*.) The line would then be connected with the new transmission line running parallel to the existing Schultz-Vantage line to the southeast. The existing Schultz-Vantage line would be connected to the vacated portion of the Sickler-Schultz line running into the Schultz Substation. The portion of the Sickler-Schultz line that runs due north from the Naneum crossing would be removed because it would no longer be needed. This combination of rerouting and reconnecting lines would eliminate the existing 500-kV line from crossings.

Southeast of Naneum crossing the new transmission line would be constructed roughly parallel to the existing Schultz-Vantage line. The new line would be located on the north side of the existing line starting with a 200-foot separation for approximately 6 miles and then a 400-foot separation for approximately 4 miles. The remaining 13 miles would have a variable separation ranging from 500 feet to 1,375 feet. Segment A would cross the Vantage Highway. Segment A is 27.5 miles long, including 2.25 miles of relocated Sickler-Schultz line and 2 miles of rebuilt line between Schultz Substation and the Naneum crossing.

2.1.1.1 Segment A Reroute

There is a potential reroute within Segment A, referred to on Map 2, *Alternatives,* and shown in detail on Map 3, *Segment A Reroute*. This reroute was introduced when BPA identified potential difficulty in acquiring the rights to build the new line parallel to the existing Schultz-Vantage line across a large parcel northwest of Colockum

Road. This parcel of land is under Tribal Allotment status, with Native American landowners. The Segment A Reroute would be located around the land parcel in question. BPA's right to keep the existing Schultz-Vantage line on the property was also in question; therefore, the Segment A Reroute includes the relocation of the existing line.

As shown on Map 3, *Segment A Reroute,* the existing Schultz-Vantage line and the new transmission line would be rerouted in a southeasterly direction approximately 1/2 mile southeast of Coleman Road. Approximately 200 feet would separate the two lines. At the crossing of Cooke Canyon Road, the lines would be directed east. The rerouted lines would then intersect with the original alignment just west of Colockum Road and the new line would remain on the north. The Segment A Reroute would be approximately 1 1/4 miles long.

If the Segment A Reroute were to be chosen, a little more than a mile of the existing Schultz-Vantage line would be removed. Please see Appendix B, *Description and Comparison of Impacts Along Segment A Reroute,* for greater detail of the Segment A Reroute.

BPA's preference is to keep the existing line where it is and to build the new line along Segment A.

2.1.2 Segment B

Segment B begins where the new transmission line would cross to the south side of the existing Schultz-Vantage line, approximately 5 miles south of where the Schultz-Vantage transmission line crosses I-90. (See Map 2, *Alternatives*.)

Segment B has two route options, B_{NORTH} and B_{SOUTH}. The original route is B_{NORTH}, which would follow the existing line at the planned separation of 1,200 feet. The YTC, which controls the land crossed by Segment B, has safety concerns regarding aerial training occurring in the same area as two 500-kV transmission lines spaced rather far apart. Representatives from the YTC requested another route where the new line would parallel other transmission lines farther to the south than the Schultz-Vantage line. These other transmission lines are less than 500-kV, thus enabling BPA to group the lines closer together and reduce the aerial training concerns.

B_{NORTH} runs to the east, parallel to and 1,200 feet south of the Schultz-Vantage line. This route option follows the existing line across the Columbia River and ends at the BPA Vantage Substation. B_{NORTH} is 9.1 miles long.

B_{SOUTH} would initially run to the southeast, then cross two other transmission lines and turn almost due east. The new line would parallel an existing 230-kV wood pole transmission line on the south side of the John Wayne Trail for approximately 5 miles. Just before the Columbia River, B_{SOUTH} would angle slightly to the north towards the Schultz-Vantage line. The two lines would parallel one another with a 300-foot separation and would cross the Columbia River. B_{SOUTH} ends at the south end of the BPA Vantage Substation and is approximately 9.5 miles long.

2.1.3 Segment C

Segment C starts in the same place as Segment B (where the new line would cross the existing Schultz-Vantage line). The segment would turn south, crossing the YTC. This segment would not parallel an existing line. The segment would angle southeast, leave the YTC, cross Highway 24, and end where it intersects the existing Hanford-Ostrander and Hanford-John Day 500-kV transmission lines. This intersection of lines would be the site of a new substation, called Wautoma Substation. Segment C is 30.1 miles long.

2.1.4 Segment D

Segment D begins in the area just south of Vantage Substation (See Map 2, *Alternatives*). The new line would not enter the substation. Segment D would head in a southeasterly direction, running parallel approximately 125 feet to the west of the existing Midway-Vantage 230-kV line. This separation would continue for approximately 4 miles and cross Crab Creek.

While climbing the Saddle Mountains, the separation between the new and existing lines would increase, with the widest point (approximately 400 feet wide) at the top of the mountain. The separation would slowly decrease on the south side of the Saddle Mountains and the lines would be immediately adjacent to one another approximately 9 miles south of Vantage Substation.

For Your Information

Double-circuit *structures hold conductors for two transmission lines.*

BPA structures are numbered. The first number is the transmission line mile and the second number is the structure in that mile.

Northeast of Mattawa, the Midway-Vantage line structures would be removed and replaced with ***double-circuit*** structures carrying the new line and the Midway-Vantage 230-kV line through irrigated areas. This double-circuit section would be about 8 miles long from existing structure 11/1 to 2/4. The conductors on the east side of the double-circuit structures would operate at 230-kV (existing Midway-Vantage line), and the west side would operate at 500-kV (new line). The ROW on the east side would extend 50 feet from centerline and on the west side it would extend 75 feet from centerline. Beyond the irrigated areas, just north of the Columbia River, Segment D would again parallel the Midway-Vantage line on the west side and cross the

Columbia River. Segment D would pass the BPA Midway Substation on the west side and continue south up the Umtanum Ridge. The new line would parallel the existing Midway-Big Eddy 230-kV line 125 feet to the west. South of State Route 24, the new line would cross to the east side of the Midway-Big Eddy where it crosses two other lines. The new line would angle away from the existing lines as it climbs and descends the Yakima Ridge, terminating in the new Wautoma Substation. Segment D is 26.7 miles long.

2.1.5 Segment E

Segment E begins at Vantage Substation and heads south, paralleling the existing Vantage-Hanford 500-kV line 1,200 feet to the north. It would cross Crab Creek, climb the Saddle Mountains, and head southeast, crossing the Saddle Mountain Unit of the Hanford Reach National Monument. After crossing the Columbia River, Segment E would end at the existing BPA Hanford Substation. Segment E is 25.3 miles long.

2.1.6 Segment F

Segment F begins at Vantage Substation and heads east, then south crossing Crab Creek and climbing the Saddle Mountains. It would then follow the Vantage-Hanford line for a short length before turning due east. Segment F would traverse about 14 miles along the south slope of the Saddle Mountains, and then intersect the Grand Coulee-Hanford 500-kV transmission line. It would then turn south and parallel the existing Grand Coulee-Hanford line 1,200 feet to the east across the Wahluke Slope. After crossing the Columbia River, the segment ends at the Hanford Substation. Segment F is 32.8 miles long.

2.2 Agency Preferred Alternative (Alternative 2)

BPA is proposing to construct a new 500-kV transmission line between the Schultz Substation, almost 9 miles north of Ellensburg, Washington, and a new substation (Wautoma Substation) in Benton County, 2 miles south of Highway 24 (T12N, R24E, Sec. 20). The Preferred Alternative is Alternative 2, made up of Segments A (including Option 1 of the Sickler-Schultz Reroute), B_{SOUTH}, and D (see Map 2, *Alternatives*), and is 63.7 miles long. It does not include the Segment A Reroute. The Preferred Alternative would cost approximately $107,000,000 (2002 dollars).

For Your Information

BPA completed a detailed cost estimate for the Preferred Alternative. The new cost is approximately 40% greater than the cost stated in the DEIS. Detailed cost estimates were not completed for the other alternatives. To be able to compare costs of alternatives, the estimated costs from the DEIS were increased by 40%.

For Your Information

*A transmission line designed to hold one electrical circuit is called **single-circuit.***

2.2.1 Transmission Line

2.2.1.1 Structures

The Preferred Alternative would primarily use 500-kV, ***single-circuit*** steel lattice structures, also called towers, to support the transmission line conductors. More than half of the structures would be delta configuration. (See Figure 2.2, *Proposed Structures*.) Flat configuration structures would be used in three selected areas. The first area would be approximately 16.2 miles, from approximately 1 mile north of Interstate 90 (I-90) in Segment A, south through the YTC and across the Columbia River in B_{SOUTH}. The next section would be in Segment D starting just north of Crab Creek going south up and over the Saddle Mountains across BLM land for 4.4 miles. The last section of flat configuration would start after the agricultural area just north of the Columbia River. Flat configuration would be used over the Columbia River, past Midway Substation and up Umtanum Ridge. The length of this last section would be approximately 3.2 miles, most of the Hanford Monument crossing.

Through the agricultural area in Segment D, 500-kV double-circuit lattice structures would be used to hold the new 500-kV and the existing 230-kV line.

A thorough description of how structures are constructed is in Appendix C, Construction Procedures

The height of each structure would vary by location and surrounding land forms. Single-circuit delta structures would average 135 feet high. Flat configuration structures would average 90 feet high. The double-circuit structures would average 170 feet high.

2.2.1.2 Conductors

__Alternating current__ is an electrical current that reverses directions at regular intervals.

The wires or lines that carry the electrical current in a transmission line are called conductors. ***Alternating current*** transmission lines, like the new line, require three sets of wires to make up a circuit. For a single-circuit 500-kV transmission line, there would be three sets of wires and for a double-circuit line (Segment D), there would be six sets of wires.

More information on how conductors are attached to structures is in Appendix C, Construction Procedures.

Conductors are not covered with insulating material, but rather use the air for insulation. Conductors are attached to the structure using porcelain or fiberglass insulators. Insulators prevent the electricity in the conductors from moving to other conductors, the structure, and the ground.

Two smaller wires, called overhead ground wires, are attached to the top of transmission structures. Overhead ground wires protect the transmission line from lightning damage. To disseminate the electrical power from lightning, the power is routed to the ground at each tower through wires called counterpoise.

2.2.2 Right-of-Way

New ROW would be needed for the new structures and line. The new ROW would be 150 feet wide for the delta configuration structures and 180 feet wide for flat configuration (See Figure 2.2, *Proposed Structures.)* The wider ROW for the flat configuration provides adequate electrical clearance for the conductors. Where the new line would parallel an existing 500-kV line (Segment A), the centerline of the new line would be from 200 to 1,375 feet from the existing line. See Appendix D, *Line Separation Issue Paper*, for an explanation of the separation distance. The land between the two transmission lines may (depending on landowner preference) be included in the easement BPA would acquire from the landowner. The distance from the new line centerline to the nearest edge of ROW would depend on the type of structure, 75 feet for delta and 90 feet for flat (to provide adequate electrical clearances).

For Your Information

A thorough description of ROW acquisition and preparation is in Appendix C, Construction Procedures and Appendix E, Property Impacts.

From I-90 south in the YTC, the new line would be located in a 180-foot-wide ROW until it joins a 115-kV line along the John Wayne Trail. In this portion of the line, the ROW would be 150 feet wide directly adjacent to the ROW of the other line. Once these two lines diverge, the new line would join the Schultz-Vantage line at a 300-foot separation and cross the Columbia River. The distance from the centerline of the new line to the outside of the ROW would be 100 feet.

In Segment D, where the existing line would be replaced with a double-circuit line, the existing ROW would be expanded 25 feet on the west side, increasing the ROW from the existing 100 feet to 125 feet. Where the new line is parallel to the 230-kV line using a delta configuration, the new ROW would be 150 feet wide. Where flat configuration would be used, the new ROW would be 180 feet wide.

BPA would obtain easements from landowners for new ROW. These easements give BPA the right to construct, operate, and maintain the line. Fee title to the land covered by the easement generally remains with the owner, and is subject to the provisions of the easement. For more information on easement acquisition, see Appendix E, *Property Impacts*.

The easement prohibits large structures, tall trees, storing flammable materials, and other activities that could be hazardous to people or endanger the transmission line. Activities that do not interfere with the transmission line or endanger people are usually not restricted.

2.2.3 Clearing

Vegetation within the ROW is restricted by height. This is required for the safe and uninterrupted operation of the line. Table 2.2-1, *Preferred Alternative: Tree Removal*, lists the number and location of trees in the ROW that would be cleared for the Preferred Alternative. In addition, there are a few trees outside of the ROW near Cooke Creek that would potentially need to be cut. These trees are tall enough to cause an outage if they were to fall. Tree specialists would examine the trees. If the trees are stable, they could remain standing, but if they are dying or diseased, they would be cut. Trees that would not typically grow taller than BPA safety limits would not be cleared from the ROW.

Table 2.2-1
Preferred Alternative: Tree Removal

Creek	Number of Trees to be Removed (approximate)
Wilson Creek	4 (Sickler-Schultz Reroute, Option 1)
Wilson Creek	0 (Sickler-Schultz Reroute, Option 2)
Naneum Creek	2 (Sickler-Schultz Reroute, Options 1 & 2)
Schnebly Creek	5
Coleman Creek	2
Cooke Creek	30

Table is new for the FEIS.

➡ For Your Information

Clearing limits and description are given in Appendix C, Construction Procedures.

At the structure sites, all trees and brush would be cut and removed within a 100-by-150-foot area, with root systems being removed from a 50-by-50-foot area for the tower footings. A portion of the site would be graded to provide a relatively level work surface for the erection crane.

Woody debris and other vegetation would either be left lopped and scattered, piled, or chipped, or would be taken off-site. Burning would not be used.

The footprint of the structures would be considered permanent disturbance for vegetation. The average footprints are 25 by 25 feet for flat configuration, 27 by 27 feet for delta configuration, and 32 by 32 feet for the double-circuit structures. The total permanent disturbance from 298 structures in the Preferred Alternative would be 5.8 acres. Temporary disturbance from equipment movement around the structures would be 119.2 acres. If Option 2 of the Sickler-Schultz Reroute is selected, the structure count would increase by 1, permanent disturbance would increase by 0.05 acre and temporary disturbance would increase by 0.8 acre.

2.2.4 Access Roads

Access roads on and off the ROW would be used to construct and maintain a new line. A combination of new and existing roads, and upgraded existing roads would be used to access the new line. Existing access roads would be used whenever possible, with ***spur roads*** constructed to the new structures.

➡ **For Your Information**

Spur roads *are short road segments branching off the trunk roads that go to each structure if the structure is not located on a trunk road.*

Construction of access roads is thoroughly described in Appendix C, Construction Procedures.

New roads would be located within the ROW wherever possible. Where conditions require, such as at steep cliffs, roads would be constructed and used outside the ROW. BPA normally acquires easements for the right to develop and maintain permanent over-ground access for wheeled vehicle travel to each structure. No permanent access road construction would be allowed in cultivated or fallow fields unless previously agreed to by the landowner. After construction of the line is completed, BPA would allow any roads in cropland to be returned to crop production.

Where existing access roads would be used, BPA would improve them to a level that supports construction travel needs. This would be done by grading, improving drainage, and adding gravel to the road surface.

The following tables show the miles of estimated new access roads and existing roads that would need to be improved for each segment of the Preferred Alternative.

New access road surfaces would be 14 feet wide with a 3-foot temporary disturbance area on either side of the road. The total disturbance width would be 20 feet. New roadbeds would be rocked.

Existing access roads along the Preferred Alternative have been surveyed and classified into four categories. Some existing access roads would not need to be improved. The other three categories vary on the extent of work needed to upgrade the roads to 14-foot roadbeds. The work breakdown of the three categories are:

- road base improvements, bladed and rocked (i.e. currently unusable with large ruts or unstable road)
- bladed and rocked
- rock only

The existing roads that would only require additional rock are located on the Hanford Monument near Midway Substation.

In the areas where helicopter tower construction would occur, road widths would be reduced to 12 feet wide. For the sake of this EIS the greater, or worst case, of 14 feet is used for disturbance estimates.

Table 2.2-2
Preferred Alternative: Estimate of Access Road Development (Length)

Segment	Segment Length (mi)	Total New Construction (mi)	Total of Improved Roads (mi)
A	27.5	10.9	23.0
BSOUTH	9.5	3.3	14.0
D	26.7	3.8	19.3
TOTAL	**63.7**	**18.0**	**56.3**

Table has been updated for the FEIS.

For Your Information

Waterbars *are smooth shallow ditches excavated at an angle across a road to decrease water velocity and divert the water off and away from the road surface.*

Dips, culverts, and ***waterbars*** would be installed within the roadbed to provide drainage. Temporary roads would be repaired and if the land use permits, the road would be reseeded with appropriate seed mixtures.

Fences, gates, cattle guards, and additional rock would be added to access roads where necessary.

Table 2.2-3
Preferred Alternative: Estimate of Access Road Disturbance (Area)

Segment	Permanent Disturbance (Ac)	Temporary Disturbance (Ac)	Total Road Work Disturbance (Ac)
A	18.50	24.65	43.15
BSOUTH	5.65	12.60	18.25
D	6.40	16.75	23.15
TOTAL	**30.55**	**54.00**	**84.55**

Table has been updated for the FEIS.

2.2.5 Pulling and Reeling Areas

Pulling and reeling areas would be needed for the installation of the conductor. Each pulling and reeling area would be 1/4 acre in size and located every 3.5 miles along the transmission line. The Preferred Alternative would require an estimated 4.25 acres to be cleared for the pulling and reeling areas along the route. Most of the pulling and reeling sites would be located within the ROW. Some would extend beyond the ROW at angles in the line.

2.2.6 Staging Areas

During construction of the transmission line, areas would be needed off the main highways, near the ROW, where equipment such as steel, spools of conductor, and other construction materials would be stored until material is needed. Where helicopters would be used to build the transmission line, staging areas would be used to pre-assemble the towers for helicopter delivery to tower sites. These sites would be close to the line and spaced about 8 to 10 miles apart.

Staging area locations would be determined by the construction contractor just before or during construction. The size of each site would vary. The construction contractor would negotiate with the landowner for the use of staging sites. An environmental review would be done before the use of a staging site is approved.

At this time, staging area locations are not known.

2.2.7 Substations

For the Preferred Alternative, a new transmission line would begin at Schultz Substation and terminate at a new substation, called Wautoma Substation. Additions and modifications would occur at Schultz Substation. No work would be needed at the Vantage or Midway Substations.

Schultz Substation – A new bay would be constructed within the existing fenced yard of the substation. The following equipment would be installed in the Schultz Substation.

Power circuit breakers – A breaker is a switching device that can automatically interrupt power flow on a transmission line at the time of a fault, such as a lightning strike. The breakers would be installed in the substations at either end of the line. The breakers would be SF6 gas breakers, which are insulated by special non-conducting gas (sulfur hexafluoride). The breakers would not contain oil, except for a small amount of hydraulic fluid used to open and close the electrical contacts.

Motor-operated disconnect switches – These devices are used to mechanically disconnect or isolate equipment. Switches are normally located on both sides of circuit breakers.

Buswork – Power moves within the substation on rigid aluminum pipes called bus tubing. The tubing is supported and vertically elevated by pedestals called bus pedestals. Buswork is a generic term to describe all equipment associated with the bus tubing.

***Potential transformers (PTs)* –** A type of transformer that uses low-voltage to monitor the high-voltage system. The low-voltage output of this transformer is used for relaying and metering.

***Substation dead-end towers* –** Towers within the confine of the substation where incoming and outgoing transmission lines end. Dead-ends are typically the tallest structures in a substation.

Wautoma Substation – A new substation would be constructed in Benton County, 2 miles south of Highway 24 (T12N, R24E, Section 20). The new substation would be sited at the intersection of the new transmission line and the Hanford-Ostrander 500-kV and Hanford-John Day 500-kV transmission lines. These two lines would be looped through the new substation. A parcel of approximately 47 acres would be purchased for the new substation. Land for the new substation would be acquired in fee and would remain in BPA and federal government ownership.

For Your Information

Construction of the substation is thoroughly described in Appendix C, Construction Procedures.

The footprint of the substation would be approximately 820 feet by 530 feet. This area would include the substation yard (equipment within the fence) and grading outside of the fence. The actual fenced area would be about 780 feet by 490 feet. Benton Rural Electric Association would build a 12.5-kV distribution line from the existing distribution line coming out of Black Rock Substation to the Wautoma site. This line would supply the power for substation equipment such as switches, breakers, lights, and air conditioning. The distribution line would be on single wood poles and located within previously disturbed land.

An access road would be built between SR 241 and the substation. From SR 241, the road would go due east for approximately 1/2 mile, then turn southeast for approximately 1/3 mile to the substation. The road would have an asphalt approach to SR 241 and the remaining road would be gravel. The travel surface would be 20 feet wide with 5-foot shoulders on each side equaling 30 feet. The road would be designed to accommodate large trucks and equipment used in the building and maintenance of the substation.

This substation would be built slightly different than the standard substation because existing lines cross the substation site and there are existing towers within the footprint of the substation. These lines would not be taken out of service during construction of the substation, so construction would occur under energized lines. Construction crews would first clear and grade the substation site to the extent possible. Conduits, drainage pipes, and the grounding system would be trenched or dug into the ground. Footings for the equipment and the foundation for the control house would then be placed in appropriate positions. Footings for new towers would be installed where needed in line with the existing transmission lines, outside of the substation boundaries. During the work window when the existing lines can be de-energized, new towers would be built for the existing transmission lines and the conductors rerouted onto the new towers and through substation equipment. Existing towers within the footprint of the substation would be removed. The existing transmission lines would be re-energized and work on the substation would continue. A chain link fence around the substation would be installed. Approximately 6 inches of rock would be laid, which would extend outside of the fence. Equipment such as breakers, buswork, switches, a generator, and PTs would be installed in the yard and the control rack would be installed in the control house.

2.2.8 Communication Equipment

BPA substations are electronically connected to BPA's transmission system control centers. Microwave communication sites and fiber optic communication lines connect BPA's high-voltage substations to system control centers located in Vancouver and Spokane, Washington. Dispatchers within the control centers remotely monitor meters and gauges on electric power equipment within each substation and receive alarm signals when emergency conditions occur. Dispatchers have the ability to disconnect lines and electrical equipment when transmission failures occur.

For Your Information

Fiber optic line installation is thoroughly described in Appendix C, Construction Procedures.

As part of the Preferred Alternative, BPA would install fiber optic cable between Vantage Substation and the new Wautoma Substation (approximately 27 miles) and from Vantage Substation north to the BPA Columbia Substation (approximately 32 miles). The new fiber would enable remote operation of the new substation as well as reinforce BPA's communication network.

From Vantage to Columbia Substation, fiber would be strung on existing transmission line structures. No new ROW would be needed and existing roads would be used for fiber installation. From Vantage to the new Wautoma Substation, the fiber would be strung on a combination of the new double-circuit transmission structures and existing lines. A combination of existing roads and new roads that would be built for the new transmission line would be used for fiber installation. From the new Wautoma Substation, fiber would also be installed on existing structures to loop back to the Midway Substation. Existing access roads would be used for fiber installation and no road improvements are expected.

The fiber cable would be less than 1 inch in diameter and would be mounted under the conductors. Every 3 to 5 miles there would be a splice box/reeling location for the stringing and tensioning of the fiber optic line. The splice box would be located on a transmission tower and an area approximately 1/4 acre in size in line with the conductors would be temporarily disturbed by a reeling truck and tensioning equipment. Five acres of temporary disturbance for the Preferred Alternative would be associated with the fiber line.

2.2.9 Maintenance

BPA would perform routine, periodic maintenance and emergency repairs on structures, substations, and accessory equipment. These activities typically include replacing insulators, inspections of structures, and vegetation control. Within the substations, BPA may need to periodically replace equipment.

Existing and new permanent access roads to structures would remain throughout the life of the line so that BPA can perform routine and emergency maintenance on the transmission line. Road maintenance could include grading and clearing, and repairing ditches and culverts.

A large part of maintenance activities is vegetation control. In Central Washington, this primarily focuses on the spread of noxious weeds. Tall growing vegetation would also need to be managed in and adjacent to the ROW, primarily where the line crosses water bodies. Vegetation maintenance activities would follow the guidelines set in the BPA Transmission System Vegetation Management Program EIS. When vegetation control is needed, a vegetation management checklist would be developed for the ROW. It would identify sensitive resources and the methods to be used to manage vegetation. Substations are periodically sprayed with herbicide to keep plants from growing and creating a safety hazard.

For Your Information

The BPA Transmission System Vegetation Management Program EIS was completed in August 2000, and describes the planning steps, agencies, and landowners to be coordinated with, and the tools to be used to control vegetation along BPA facilities. This document is available for review on the web at http://www.efw.bpa.gov/cgi-bin/PSA/NEPA/SUMMARIES/VegetationManagement_EIS0285.

2.3 Alternative 1

Alternative 1 would start at the Schultz Substation and follow Segments A and B_{SOUTH}. As with the Preferred Alternative, Alternative 1 would not include the Segment A Reroute. The line would enter the Vantage Substation in order to pass to the east side of existing lines. It would then follow the existing Vantage-Hanford 500-kV line 1,200 feet to the north along Segment E, and would be 62.3 miles long. The new line would end at the existing Hanford Substation. The outside limits of the Hanford Substation would not need to be expanded for this alternative. This alternative has an estimated cost of $124,000,000.

Reminder

Detailed cost estimates were not completed for the other alternatives. To be able to compare costs of alternatives, the estimated costs from the DEIS were increased by 40%.

2.3.1 Transmission Line

2.3.1.1 Structures

Alternative 1 would use 500-kV delta and flat configuration single-circuit steel lattice structures. (See Figure 2.2, *Proposed Structures*.) The height of each structure would vary by location and surrounding land forms; the delta configuration structures would have an average height of 135 feet, while the flat configuration structures would average 90 feet.

The structures used in Segments A and B_{SOUTH} would be the same as described in the Preferred Alternative. In Segment E, delta configuration structures would be used out of Vantage Substation, but just north of Crab Creek flat configuration structures would be used continuing south up and over the Saddle Mountains. The length would be approximately 9.5 miles and end at the agricultural fields. Another section of flat configuration would be approximately 6 miles across the Hanford Monument and into Hanford Substation.

2.3.1.2 Conductors

The single-circuit transmission line would be made up of three sets of wires. The insulators and overhead ground wires would be the same as discussed earlier for the Preferred Alternative.

2.3.2 Right-of-Way

The ROW would be 150 feet wide for the delta configuration structures and 180 feet wide for the flat configuration structures. The distances and ROW widths for Segments A and B_{SOUTH} would be the same as described in the Preferred Alternative. Along Segment E, similar to in Segment A, where the line separation would be 1,200 feet, BPA would acquire easement rights from the landowners for the land between the two lines, including the new ROW. See Appendix D, *Line Separation Issue Paper*, for an explanation of the separation distance.

Easement provisions would be the same as those discussed earlier for the Preferred Alternative.

2.3.3 Clearing

Clearing requirements would be the same as those discussed earlier for the Preferred Alternative. The structure footprints would be the same as described earlier for the single-circuit structures. The total permanent disturbance as a result of the 281 structures would be approximately 5.6 acres. Temporary disturbance from the equipment movement around the structures would be approximately 114.3 acres. If Option 2 of the Sickler-Schultz Reroute is selected, the structure count would increase by 2, permanent disturbance would increase by 0.05 acre and temporary disturbance would increase by 0.8 acre.

2.3.4 Access Roads

A new access road system would be built for the majority of Alternative 1. Wherever possible, the access roads would be located on the ROW. BPA normally acquires easements for the right to develop and maintain permanent over-ground access for wheeled vehicle travel to each structure. No permanent access road construction would be allowed in cultivated or fallow fields. Any roads in cropland would be removed and the ground would be restored to the original contour when construction of the line is completed.

The following tables show the miles of estimated new access roads and existing roads that would need to be improved for each segment of Alternative 1. Assumptions were made based on terrain and line location.

New access roads surfaces would be 14 feet wide, with a 3-foot temporary disturbance area on either side. New and existing road beds would be gravel or rock. Existing roads would be upgraded to 14 feet wide where necessary.

Drainage, fences, and gates would be installed where needed as described earlier for the Preferred Alternative.

Table 2.3-1
Alternative 1: Estimate of Access Road Development (Length)

Segment	Segment Length (mi)	New Construction (road mi/ segment mi)	Total New Construction (mi)	Improvement (road mi/ segment mi)	Total of Improved Roads (mi)
A	27.5	0.40	10.9	0.84	23.0
BSOUTH	9.5	0.35	3.3	1.47	14.0
E	25.3	0.33	8.4	2	50.6
TOTAL	**62.3**		**22.6**		**87.6**

Table has been updated for the FEIS.

Table 2.3-2
Alternative 1: Estimate of Access Road Disturbance (Area)

Segment	Permanent Disturbance (Ac)	Temporary Disturbance (Ac)	Total Road Work Disturbance (Ac)
A	18.50	24.65	43.15
BSOUTH	5.65	12.60	18.25
E	14.25	42.90	57.15
TOTAL	**38.40**	**80.15**	**118.55**

Table has been updated for the FEIS.

2.3.5 Pulling and Reeling Areas

Pulling and reeling areas would be needed for the installation of the conductor. Each pulling and reeling area would be 1/4 acre in size and located every 3.5 miles. Alternative 1 would require an estimated 4.5 acres to be cleared for the pulling and reeling areas along the route.

2.3.6 Staging Areas

Staging areas would be located and used similar to those described earlier for the Preferred Alternative.

2.3.7 Substations

For Alternative 1, a new transmission line would begin at the Schultz Substation and end at Hanford Substation. The line would pass through the Vantage Substation, but no electrical equipment would be installed within the Substation as part of this project.

Schultz Substation – The new equipment installed at Schultz Substation would be the same as described earlier for the Preferred Alternative.

Hanford Substation – A new bay would be constructed within the existing fenced yard of the substation. Outside of the substation fence, one or two of the existing transmission line structures may need to be relocated in order to align with the readjusted substation equipment. The new equipment within the substation would include breakers, switches, buswork, and PT's.

Vantage Substation – The line would pass through the Vantage Substation in order to get from the west to east side of existing lines. A new bay and dead end would be constructed within the existing fenced yard of the substation. Some existing transmission line towers may need to be moved to make room for the new line.

2.3.8 Communication Equipment

As part of Alternative 1, BPA would install fiber optic cable between Vantage Substation and Midway Substation (about 19.3 miles) and from Vantage Substation north to the BPA Columbia Substation (about 32 miles). The new fiber would reinforce BPA's communication network and make the fiber optic system more reliable.

The fiber optic cable would be strung on existing transmission line structures. The fiber cable would be less than 1 inch in diameter. As described in the Preferred Alternative, every 3 to 5 miles there would be a splice box/reeling location for the stringing and tensioning of the fiber optic line. These sites would result in 1/4 acre of temporary disturbance each or approximately 4.25 acres for the new fiber to be installed as part of Alternative 1.

2.3.9 Maintenance

Maintenance activities would be similar to those described earlier for the Preferred Alternative.

2.4 Alternative 3

Reminder

Detailed cost estimates were not completed for the other alternatives. To be able to compare costs of alternatives, the estimated costs from the DEIS were increased by 40%.

Alternative 3 would start at the Schultz Substation and follow Segment A. It would not include the Segment A Reroute. It would then turn south and follow Segment C through the YTC. South of the YTC in Benton County, the line would terminate at the new Wautoma Substation as described earlier for the Preferred Alternative and would be 57.6 miles long. This alternative has an estimated cost of $94,000,000. No land costs were added to the estimate for the purchase of easements across the YTC. Due to the large impact to the Army, BPA would possibly need to compensate the Army for the loss of the use of land used for maneuvers, thereby potentially increasing the cost of Alternative 3.

2.4.1 Transmission Line

The structures used in Segment A would be the same as described in the Preferred Alternative. The structures within Segment C across the YTC would be flat configuration for approximately 24 miles. Outside of the YTC land, delta configuration structures would be used for approximately 6 miles.

2.4.2 Right-of-Way

The ROW would be 180 feet wide for the flat configuration structures and 150 feet wide for the delta configuration structures. The distances and ROW widths for Segment A would be the same as described in the Preferred Alternative. Along Segment C, the ROW width would reflect the width needed for the particular structures; this portion of the line would not be parallel to any existing lines.

Easement provisions would be the same as those discussed earlier for the Preferred Alternative.

2.4.3 Clearing

Clearing requirements would be the same as those discussed earlier for the Preferred Alternative. The structure footprints would be the same as described earlier for the single-circuit structures. The total permanent disturbance as a result of the 269 structures would be approximately 4.7 acres. Temporary disturbance from the equipment movement around the structures would be approximately 110 acres. If Option 2 of the Sickler-Schultz Reroute is selected, the structure count would increase by 2, permanent disturbance would increase by 0.05 acre and temporary disturbance would increase by 0.8 acre.

2.4.4 Access Roads

New access roads would be built for the majority of Alternative 3. Roads would be built as described earlier for the Preferred Alternative.

The following tables show the miles of estimated new access roads and existing roads that would need to be improved for each segment of Alternative 3. Assumptions were made based on terrain and line location.

Table 2.4-1
Alternative 3: Estimate of Access Road Development (Length)

Segment	Segment Length (mi)	New Construction (road mi/ segment mi)	Total New Construction (mi)	Improvement (road mi/ segment mi)	Total of Improved Roads (mi)
A	27.5	0.4	10.9	0.84	23.0
C	30.1	2.8	84.3	2.5	75.3
TOTAL	**57.6**		**95.2**		**98.3**

Table has been updated for the FEIS.

Table 2.4-2
Alternative 3: Estimate of
Access Road Disturbance (Area)

Segment	Permanent Disturbance (Ac)	Temporary Disturbance (Ac)	Total Road Work Disturbance (Ac)
A	18.50	24.65	43.15
C	143.05	109.55	252.60
TOTAL	**161.55**	**134.20**	**295.75**

Table has been updated for the FEIS.

2.4.5 Pulling and Reeling Areas

Pulling and reeling areas would be needed for the installation of the conductor. Each pulling and reeling area would be 1/4 acre in size and located every 3.5 miles. Alternative 3 would require an estimated 4.75 acres to be cleared for the pulling and reeling areas along the route.

2.4.6 Staging Areas

Staging areas would be located and used similar to those described earlier for the Preferred Alternative.

2.4.7 Substations

For Alternative 3, a new transmission line would begin at the Schultz Substation and end at the new Wautoma Substation.

Schultz Substation – The new equipment installed at Schultz Substation would be the same as described earlier for the Preferred Alternative.

Wautoma Substation – The construction of the substation would be the same as described earlier for the Preferred Alternative.

2.4.8 Communication Equipment

Alternative 3 would include the installation of fiber optic cable between Vantage Substation north to Columbia Substation as well as south to the new Wautoma Substation as described in the Preferred Alternative. Between Vantage and the new Wautoma Substations, the fiber would be added to existing lines. The number of reeling and tensioning sites and the amount of disturbance caused by those would be approximately the same as that of the Preferred Alternative.

2.4.9 Maintenance

Maintenance activities would be similar to those described earlier for the Preferred Alternative.

2.5 Alternative 1A

Alternative 1A would start at the Schultz Substation and follow Segments A and B_{SOUTH}. As with the Preferred Alternative, Alternative 1A would not include the Segment A Reroute. The new line would enter the Vantage Substation and cross to the east side of the existing transmission lines. The line would then follow Segment F into Hanford Substation. The line would be approximately 69.8 miles long. The outside limits of the Hanford Substation would not need to be expanded for this alternative. This alternative has an estimated cost of $94,000,000.

Reminder

Detailed cost estimates were not completed for the other alternatives. To be able to compare costs of alternatives, the estimated costs from the DEIS were increased by 40%.

2.5.1 Transmission Line

2.5.1.1 Structures

In Segment F, delta configuration structures would be used out of Vantage Substation, but just north of Crab Creek flat configuration structures would be used continuing south up the Saddle Mountains. Due to wildlife concerns, flat configuration would be used along the Saddle Mountains, through the Hanford Monument, and into Hanford Substation.

2.5.1.2 Conductors

The conductors and overhead groundwire would be the same as discussed earlier for the Preferred Alternative.

2.5.2 Right-of-Way

The ROW would be 150 feet wide for the delta configuration structures and 180 feet wide for the flat configuration structures. The distances and ROW widths for Segments A and B_{SOUTH} would be the same as described in the Preferred Alternative. Along Segment F, the ROW width would be 180 feet wide for the flat configuration. Where the line would turn south and parallel the existing 500-kV transmission line, the separation would be 1,200 feet. BPA would acquire easement rights from the landowners for the land between the two lines, including the new ROW. See Appendix D, *Line Separation Issue Paper*, for an explanation of the separation distance.

Easement provisions would be the same as those discussed earlier for the Preferred Alternative.

2.5.3 Clearing

Clearing requirements would be the same as those discussed earlier for the Preferred Alternative. The structure footprints would be the same as described earlier for the single-circuit structures. The total permanent disturbance as a result of the 326 structures would be approximately 6.5 acres. Temporary disturbance from the equipment movement around the structures would be approximately 133.2 acres. If Option 2 of the Sickler-Schultz Reroute is selected, the structure count would increase by 2, permanent disturbance would increase by 0.05 acre and temporary disturbance would increase by 0.8 acre.

2.5.4 Access Roads

New access roads would be built for the majority of Alternative 1A. Roads would be built as described earlier in Alternative 1.

The following tables show the miles of estimated new access roads and existing roads that would need to be improved for each segment of Alternative 1A. Assumptions were made based on terrain and line location.

Table 2.5-1
Alternative 1A: Estimate of Access Road Development (Length)

Segment	Segment Length (mi)	New Construction (road mi/ segment mi)	Total New Construction (mi)	Improvement (road mi/ segment mi)	Total of Improved Roads (mi)
A	27.5	0.40	10.9	0.84	23.0
BSOUTH	9.5	0.35	3.3	1.47	14.0
F	32.8	0.89	29.2	1	32.8
TOTAL	**69.8**		**43.4**		**69.8**

Table has been updated for the FEIS.

Table 2.5-2
Alternative 1A: Estimate of Access Road Disturbance (Area)

Segment	Permanent Disturbance (Ac)	Temporary Disturbance (Ac)	Total Road Work Disturbance (Ac)
A	18.50	24.65	43.15
BSOUTH	5.65	12.60	18.25
F	19.55	45.10	57.15
TOTAL	**43.70**	**82.35**	**118.55**

Table has been updated for the FEIS.

2.5.5 Pulling and Reeling Areas

Pulling and reeling areas would be needed for the installation of the conductor. Each pulling and reeling area would be 1/4 acre in size and located every 3.5 miles. Alternative 1A would require an estimated 5 acres to be cleared for the pulling and reeling areas along the route.

2.5.6 Staging Areas

Staging areas would be located and used similar to those described earlier for the Preferred Alternative.

2.5.7 Substations

For Alternative 1A, a new transmission line would begin at the Schultz Substation and end at Hanford Substation. The line would pass through Vantage Substation.

Schultz Substation – The new equipment installed at Schultz Substation would be the same as described earlier for the Preferred Alternative.

Hanford Substation – The new equipment installed at the Hanford Substation would be the same as described earlier for Alternative 1.

Vantage Substation – The line would pass through the Vantage Substation in order to get from the west to east side of existing lines as described earlier for Alternative 1.

2.5.8 Communication Equipment

BPA would install fiber optic cable similar to what is described earlier for Alternative 1.

2.5.9 Maintenance

Maintenance activities would be similar to those described earlier for the Preferred Alternative.

2.6 No Action Alternative (Environmentally Preferred)

The No Action Alternative is traditionally defined as the no build alternative and, for this project, has been selected as the Environmentally Preferred Alternative. This alternative would mean that a new transmission line would not be built, and no other equipment would be added to the transmission system. Maintenance and operation of the existing transmission line and substations would continue unchanged.

2.7 Alternatives Eliminated from Detailed Consideration

BPA studied a variety of alternatives to meet the need for the project. After preliminary study, the following alternatives were eliminated from detailed consideration for technical or economic reasons.

2.7.1 Alternative 4 Transmission Line

BPA studied the possibility of paralleling the existing Columbia-Ellensburg-Moxee-Midway 115-kV transmission line. The new line would begin at Schultz Substation and be routed through Ellensburg and Yakima, west of the YTC and into a new substation. This was referred to as Alternative 4 during the scoping period. BPA received a large number of comments from the public in opposition to this alternative. The existing 115-kV line is adjacent to many homes. Early estimates showed that the cost to buy property and relocate residents would be over $60,000,000. This did not include new transmission equipment, substation equipment, or construction costs. This alternative was eliminated from further study due to cost.

2.7.2 Schultz-Ashe Transmission Line

During the scoping process, maps presented by BPA showed a possible route going through the Hanford Substation and on to the BPA Ashe Substation located on the Hanford Site. Transmission system studies showed that line termination at the Ashe Substation, rather than the Hanford Substation, did not improve reliability. Termination of the line at the Ashe Substation also did not improve transfer capability over the Hanford Substation or Wautoma Substation alternatives. The 17 additional miles of transmission line needed for this alternative would increase the cost of construction by about $13,000,000.

This alternative was eliminated from further study because the system studies did not show an electrical benefit versus the added cost associated with the added miles of transmission line.

2.7.3 Undergrounding

During the scoping process, some people suggested burying the transmission line. Occasionally BPA has used underground transmission cables for new lines. Transmission line cables are highly complex in comparison to overhead transmission lines. For a 500-kV line, the underground cable could be 10 to 15 times the cost of an overhead design.

Because of cost, BPA uses underground cable in limited situations. Underground cables are considered where an overhead route is not appropriate, such as water crossings, such as in the San Juans, or in urban areas.

Underground transmission cables used by BPA are short in comparison to typical overhead transmission lines. BPA's longest underground transmission cable (at 115-kV) is 8 miles. The Bureau of Reclamation operates two 500-kV underground cable circuits at Grand Coulee Dam. These circuits are about 6,000 feet long.

Cable technologies have not advanced as fast as the industry anticipated they would 10 years ago, nor have costs declined as expected. Underground cable remains a tool available for special situations, but because of its high cost it was eliminated from further consideration.

2.7.4 Non-Transmission Alternatives

During the comment period of the DEIS, comments were received asking BPA to examine alternatives such as energy conservation and demand reduction measures, or load and generation curtailment during outage conditions. These types of alternatives are collectively referred to as non-transmission alternatives. BPA had examined these types of alternatives, but had not included them in the DEIS.

To meet the need described in Chapter 1, BPA considered non-transmission alternatives, including energy conservation and demand reduction measures to reduce overload on the transmission system, as well as load and generation curtailment during outage conditions. Results of this study are in a report entitled "Expansion of BPA Transmission Planning Capabilities," which has been incorporated by reference in this EIS (Energy and Environmental Economics, Nov. 2001). This report was prepared for BPA by outside consultants to recommend how BPA might more effectively plan to meet transmission needs. The report also provided a preliminary screening of various transmission projects (including this project) to determine whether the use of non-transmission alternatives would be viable. The conclusions summarized below confirmed BPA's earlier assessment that non-transmission alternatives were not reasonable alternatives to meet the need as described in Chapter 1.

2.7.4.1 Conservation and Demand Management Alternatives

There are only small amounts of load north of the north of Hanford area. Conservation that reduces load to the north would only make the problem worse by increasing the amount of electricity that must cross the north of Hanford area. Other alternatives such as fuel switching (from electric to gas) or curtailing load would cause the problem to worsen because they reduce area load, thereby increasing the electricity that must flow across the constrained path. Distributed generation north of the north of Hanford area would also increase the congestion.

South of the north of Hanford area, conservation, generation additions, fuel switching, or curtailing load would not improve the problem unless existing generation north of the constrained area is shut down. Curtailing generation at hydroelectric projects at times could lead to spill conditions that would violate water quality standards for dissolved gases and could be harmful to fish.

2.7.4.2 Pricing Alternatives

Reminder

Words in bold and italics are found in Chapter 10, Glossary and Acronyms.

Currently, BPA, like all utilities in the Northwest, charges for transmission services using a fixed price for each megawatt of power delivered. The price is determined in a formal process known as a rate case. Alternatives such as ***locational pricing*** and ***time-of-use rates*** provide price signals to encourage parties to use limited transmission capability more efficiently. Most ***Regional Transmission Organizations (RTOs)*** essentially change the price of transmission when the grid becomes constrained, an approach called ***congestion pricing***.

BPA considered these alternative pricing structures in the rate case that determined the transmission rates currently in effect. Rate case participants argued that these pricing approaches were best developed in a region-wide RTO environment, and should be deferred until the ***proposed RTO West*** is operational. BPA's current transmission rates expire on September 30, 2003. BPA will assess the situation and examine alternative rate constructs in the next rate case.

Congestion pricing works to reduce congestion by allowing generation on the surplus side of the constraint (north side of north of Hanford) to shut down and purchase replacement power (or controllable demand) on the deficit (south) side. This approach is effective when there are competitive markets for generation or controllable demand on both sides of the transmission constraint.

There is significant hydro generation surplus to the north that cannot readily be redispatched during the spring and early summer months.

Reduced hydro generation could result in water being spilled. Spilling water at these dams could violate state water quality standards and harm fish.

Hydro resources south of the Hanford area, on the lower Columbia, are often run at minimum levels during parts of the spring/summer. The water in the river is spilled over the dams to help move young fish down the river and out to the ocean. Also, coal and natural gas resources south of the Hanford area are likely to be running at high levels to participate in the California market. Generation would not be available to displace what is not generated north of the Hanford area. This project is not a good candidate for congestion pricing.

2.8 Comparison of Alternatives and Summary of Impacts

A team of environmental specialists evaluated the impacts associated with each of the alternatives. Each resource specialist developed an impact assessment methodology that determined the level, magnitude, and significance of their impact findings, which are described in Chapter 4, *Environmental Consequences*. Table 2.8-1, *Summary of Impacts*, summarizes the environmental impacts for each alternative.

Chapter 1, *Purpose and Need*, identifies the purposes for this project. Purposes help decision-makers decide which alternative is the best solution to meet the need. Table 2.8-2, *Comparison of Alternatives to Project Purposes*, describes how each alternative fulfills the purposes.

For Your Information

Impacts to resources along route options B_{NORTH} and B_{SOUTH} ranged from none to moderate. For all resources studied, there were no significant differences in impacts between B_{NORTH} and B_{SOUTH}.

Impacts to resources along the Segment A Reroute are discussed in Appendix B, Description and Comparison of Impacts Along Segment A Reroute. A comparison between the Segment A reroute and the corresponding portion of Segment A is also included.

Table 2.8-1
Summary of Impacts

Resource	Existing Conditions	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action
Water Resources (See Sections 3.1, *Water Resources*, and 4.1, *Water Resources, Soils, and Geology*.)	Watersheds within the project area are a part of the Yakima and Columbia River Basins. With the exception of the Columbia River, water is scarce. Streams are generally small and intermittent. Lower Crab Creek and the Columbia River are listed as water-quality limited under Section 303(d) of the Federal Clean Water Act, due to extensive habitat modification. In addition, the project area is within the Columbia Plateau basaltic aquifer system. Groundwater quality issues are mostly due to elevated concentrations of nutrients, trace organic compounds and nitrates.	Impacts would be low to moderate and short term. Sedimentation, increased runoff, and short-term turbidity would occur. It is not anticipated that impacts to streams listed as water-quality limited under Section 303(d) would alter the parameters for which they are listed. Impacts to aquifers are not anticipated.	Impacts would be low to moderate and short term. Similar to the Preferred Alternative.	Impacts would be moderate and short term. This alternative has the largest number of acres of new access roads. This would cause sedimentation, increased runoff, and short-term turbidity to water resources. No Section 303(d) stream would be crossed. Impacts to aquifers are not anticipated.	Impacts would be low to moderate and short term. Similar to the Preferred Alternative.	No new impacts are expected.

Resource	Existing Conditions	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action
Floodplains (See Sections 3.2, *Floodplains and Wetlands,* and 4.2, *Floodplains and Wetlands.*)	All proposed alternatives would cross 100-year floodplain areas. The floodplain associated with the Columbia River is narrow, due to the regulation of flows by upstream dams. One floodplain is associated with Nunnally Lake, a narrow water body. The remainder of the floodplains in the project area are narrow and associated with creeks, including Wilson, Naneum, Caribou, Crab, and Dry Creeks. Impacts to floodplains could occur from the placement of structures.	Impact to floodplains would be low to moderate. Two floodplains would be impacted. One structure and an access road would be constructed in the 100-year floodplain of Naneum/Wilson Creek slightly decreasing the amount of flood storage, which would be a low level of impact. A new access road with two 9-foot arch culverts would cross the Dry Creek 100-year floodplain, altering the course of floodwaters and decreasing the amount of flood storage, which would be a high level of impact. The new substation would be located outside of the floodplain.	Impacts to floodplains would be low. Two floodplains would be impacted. One structure and an access road would be constructed in the 100-year floodplain of Naneum/Wilson Creek slightly decreasing the amount of flood storage, which would be a low level of impact.	Impact to wetlands would be low to moderate. Two floodplains would be impacted. One structure and an access road would be constructed in the 100-year floodplain of Naneum/Wilson Creek slightly decreasing the amount of flood storage, which would be a low level of impact. A new access road with two 9-foot arch culverts would cross the Dry Creek 100-year floodplain, altering the course of floodwaters and decreasing the amount of flood storage, which would be a high level of impact. The new substation would be located outside of the floodplain.	Impact would be the same as Alternative 1.	No new impacts are expected.

Resource	Existing Conditions	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action
Wetlands (See Sections 3.2, *Floodplains and Wetlands,* and 4.2, *Floodplains and Wetlands.*)	Wetlands are uncommon within the shrub-steppe areas of eastern Washington. Wetlands found in the area are typically supported by water sources such as creeks, springs, seeps and surface runoff.	Impacts to wetlands would be moderate. Seven wetlands were identified along the preferred alternative. Four of these wetlands would have moderate impacts from new access road or tower construction and access road improvements. Three wetlands would have no impacts. Associated wetland at Cooke Creeks would have 25-30 cottonwoods removed. Maintenance activities such as improving access roads could impact wetlands.	Impacts to wetlands would be moderate, similar to the Preferred Alternative, with 12 creek crossings and possible removal of trees in three riparian areas.	Impacts to wetlands would be moderate, similar to the Preferred Alternative, with 18 creek crossings and possible removal of trees in two riparian areas.	Impacts to wetlands would be moderate, similar to the Preferred Alternative, with 11 creek crossings and possible removal of trees in four riparian areas.	No new impacts are expected.
Soils & Geology (See Sections 3.3, *Soils and Geology*, and 4.1, *Water Resources, Soils, and Geology*.)	There are diverse landforms and geologic features within the Columbia Plateau. The plateau's landscape consists mostly of large and small hills with flat tops, extensive plateaus, incised rivers, and anticline ridges. Geologic hazards include steep slopes and erosion. Blowing soil and water erosion are the most active erosion processes, due to the area's high relief, steepness of slope, and restricted available water.	Low to moderate impact is anticipated, caused by erosion, the loss of productive soils, and increased runoff.	Low to moderate impacts are anticipated similar to the Preferred Alternative.	Moderate impacts would occur caused by erosion, loss of productive soils, and increased runoff.	Low to moderate impacts are anticipated similar to the Preferred Alternative.	No new impacts are expected.

Resource	Existing Conditions	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action
Vegetation (See Sections 3.4, *Vegetation*, and 4.3, *Vegetation*.)	The vegetation in most of the project area is shrub-steppe. With the exception of some riparian areas, few trees are found. Sagebrush species are the dominant woody vegetation. Two Washington Natural Heritage Program (WNHP) high-quality plant communities occur in the project area: the Wyoming big sagebrush/ bluebunch wheatgrass shrubland (Segment A), and the bitterbrush/ Indian ricegrass shrubland (Segments D, E, and F).	There are potential temporary impacts to 161.45 acres of shrub-steppe areas and potential permanent impacts to 44.40 acres of shrub-steppe. In Segment A, there are potential temporary impacts to 2.10 acres of forested and riparian areas and 0.10 acres permanent impacts. Disturbance to these shrub-steppe and riparian areas represents a moderate to high impact. In Segment D, 2.10 acres of temporary impacts and 0.25 acres of permanent impacts to a WNHP high quality plant community would be caused by construction, which would be a moderate impact. The introduction or spread of weed species would be a high impact.	There are potential temporary impacts to 174.10 acres of shrub-steppe areas and potential permanent impacts to 39.50 acres of shrub-steppe. There are potential temporary impacts to 2.95 acres of forested and riparian areas and 0.10 acres permanent impacts. Disturbance to these shrub-steppe and riparian areas represents a moderate to high impact. There are potential impacts to 2.8 miles of a WNHP high-quality plant community in Segment E. This represents a moderate to high impact. The introduction or spread of weed species would be a high impact, depending on the quality of the plant communities affected.	There are potential temporary impacts to 251.20 acres of shrub-steppe areas and potential permanent impacts to 175.65 acres of shrub-steppe. There are potential temporary impacts to 3.25 acres of forested and riparian areas and 0.10 acres permanent impacts. Disturbance to these shrub-steppe and riparian areas represents a moderate to high impact. The construction of a new transmission line in an area currently without one is expected to degrade existing plant communities. This could result in a low to high impact, depending on the quality of the plant communities impacted. The introduction or spread of weed species would be a high impact, depending on the quality of the plant communities affected.	There are potential temporary impacts to 215.25 acres of shrub-steppe areas and potential permanent impacts to 79.00 acres of shrub-steppe. In Segment A, there are potential temporary impacts to 2.10 acres of forested and riparian areas and 0.10 acres permanent impacts. Disturbance to these shrub-steppe and riparian areas represents a moderate to high impact. The construction of a new transmission line in an area currently without one is expected to degrade existing plant communities. This could result in a low to high impact, depending on the quality of the plant communities impacted. There are potential impacts to 0.3 miles of WNHP high-quality plant community in Segment F. This represents a moderate to high impact. The introduction or spread of weed species would be a high impact depending on the quality of the plant communities affected.	No new impacts would occur.

Resource	Existing Conditions	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action
Threatened & Endangered, and Sensitive Vegetation (See Sections 3.4, *Vegetation*, and 4.3, *Vegetation*.)	Potential habitat for rare and endangered plant species is scattered throughout the study area. A survey of the preferred alternative identified populations of these species.	Impacts would be moderate to high if species are not avoided. Along Segment D, there is known habitat for Umtanum wild buckwheat (federal candidate) just off the ROW. This area would be avoided. Tufted evening primrose, Piper's daisy and desert cryptantha (State sensitive species) would be impacted on part of Segment $B_{SOUTH,}$ and D, a moderate impact. Columbia milk-vetch, gray cryptantha and Hoover's desert parsley could be impacted on Segment D, a moderate impact.	Impacts would be moderate to high if species are not avoided. Tufted evening primrose, and desert cryptantha (State sensitive species) would be impacted on part of Segment $B_{SOUTH,}$ a moderate impact. .	Impacts would be moderate to high if species are not avoided. Columbia milk-vetch (federal species of concern is located in the alignment of Segment C. and could be impacted, a moderate impact.	Impacts would be moderate to high if species are not avoided. Tufted evening primrose and desert cryptantha (State sensitive species) would be impacted on part of Segment $B_{SOUTH,}$, a moderate impact. Along Segment F, Hoover's desert parsley (federal species of concern), dwarf evening primrose (state threatened), and Texosporium sancti - jacobi (federal species of concern) are present and could be impacted, a moderate impac t	No new impacts would occur.
Wildlife (See Sections 3.5, *Wildlife*, and 4.4, *Wildlife*.)	The shrub-steppe habitat in the study area supports a variety of wildlife species including birds, mammals, reptiles, and amphibians. The study area is located within the Pacific Flyway. Crab Creek (Segments D, E, and F) is an important wildlife migratory corridor, and one of the most important flyways in Washington for migrating birds.	Impacts would be high to low. Parts of Segment A are relatively undisturbed shrub-steppe habitat. Existing habitat along Segment D is variably degraded.	Impacts would be high to moderate. Parts of Segment A are relatively undisturbed shrub-steppe habitat. Segment E is mostly disturbed agricultural area with low habitat value, except for the Hanford Site, which is high quality, important undisturbed shrub-steppe habitat.	Impacts would be high. Parts of Segment A are relatively undisturbed shrub-steppe habitat. Existing habitat in Segment C is relatively undisturbed, especially in the YTC.	Impacts would be high. Parts of Segment A are relatively undisturbed shrub-steppe habitat. Segment F along Saddle Mountains is high elevation, sensitive habitat that is relatively undisturbed. The Hanford Site is high quality, important undisturbed shrub-steppe habitat.	No new impacts would occur.

Resource	Existing Conditions	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action
Threatened & Endangered Wildlife (See Sections 3.5, *Wildlife*, and 4.4, *Wildlife*.)	The south side of Umtanum Ridge (Segment C) is a core area for sage grouse. Wintering and breeding bald eagles occur in the project area.	With mitigation, impacts would be low to bald eagles that winter along Wilson and Naneum Creeks on Segment A. Impacts to sage grouse along Segment A and B would be low to moderate. Segment D has few T&E species occurrences.	With mitigation, impacts would be low to bald eagles that winter along Wilson and Naneum Creeks on Segment A and in the Hanford Reach National Monument on Segment E Impacts to sage grouse along Segment A and B would be low to moderate.	With mitigation, impacts would be low to bald eagles that winter along Wilson and Naneum Creeks on Segment A and in the Hanford Reach National Monument on Segment E Impacts to sage grouse along Segment A would be low to moderate and along Segment C would be high.	With mitigation, impacts would be low to bald eagles that winter along Wilson and Naneum Creeks on Segment A and in the Hanford Reach National Monument on Segment F Impacts to sage grouse along Segment A and B would be low to moderate.	No new impacts would occur.
Fish Resources (See Sections 3.6, *Fish Resources*, and 4.5, *Fish Resources*.)	Several streams that the project would cross provide habitat for over 16 species of fish. In addition, the Columbia River hosts approximately 40 species of fish. chinook salmon, sockeye salmon, steelhead, and Pacific lamprey use the Columbia River in the study area as a migration corridor. Fish commonly pursued for sport include whitefish, small-mouth bass, sturgeon, catfish, walleye, and perch. Rough fish such as squawfish, carp, suckers, and shiners are also present in large numbers.	Impacts would be low to none. Ten fish-bearing streams would be crossed.	Impacts would be low to none. Eleven fish-bearing streams would be crossed.	Impacts would be moderate to low. Seventeen fish-bearing streams would be crossed.	Impacts would be low to none. Eleven fish-bearing streams would be crossed.	No new impacts would occur.

Resource	Existing Conditions	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action
Land Use (See Sections 3.7, *Land Use*, and 4.6, *Land Use*.)	The alternatives cross private and public land in five Washington counties. Land use varies by line segment, but mostly include rangelands and some agricultural lands, military lands and lands designated for preservation, and limited residential lands.	The overall land use impact would be moderate. There would be a moderate to high impact on residential and quarry land uses, which are localized. The impact to the YTC would be moderate/ low. Impacts to the Hanford Reach National Monument would be high. Impacts to other public lands would be low to moderate. Agricultural impacts would be moderate along Segment D, where about 8 miles would be double-circuited, but high in other places.	Overall impact to land use would be high. Impacts to the YTC and quarry land use are similar to the Preferred Alternative. About 4.8 miles of agricultural lands on both public and private land would be affected, a high impact. Impacts to residential uses along portions of Segment E would be low, but high along Segment A. Impact to BLM lands would be low. The land crossed on the Hanford Reach National Monument and the Hanford Site has a Preservation land use designation. Since this alternative would require new ROW, the impact to preservation efforts would be high.	Impacts to land use would be high. The majority of land crossed is on the YTC. The new transmission line would eliminate the Department of Defense's ability to perform the training, aviation, and ground maneuvers that currently occur, which would be a high impact. The remaining land crossed is both public and private rangeland. Impacts to rangeland would be low. There would be a moderate to high impact on residential and quarry land uses, which is localized.	Impacts to land use would be moderate. Impacts to the YTC, residential, and quarry land uses are similar to the Preferred Alternative. Segment F would require new ROW, with 39.2% of the line crossing land administered by BLM for multiple land uses. Impact to the BLM lands would be low. The land crossed on Hanford Reach National Monument and the Hanford Site has a Preservation land use designation. Since this alternative would require new ROW, the impact to preservation efforts would be high.	No new impacts would occur.

Resource	Existing Conditions	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action
Socioeconomics (See Sections 3.8, *Socioeconomics*, and 4.7, *Socioeconomics*.)	The rural character of central Washington is linked to the local socioeconomics. Agriculture is an important industry sector that influences local economies and demographic composition. Other industries important to the area include service, retail trade, and manufacturing sectors. In general, Kittitas, Grant, Yakima, and Benton counties are less racially diverse, have lower per capita and median household incomes, and have a lower percentage of income derived from work earnings than Washington state as a whole.	No impacts to local populations are expected to occur. Two residences would be relocated, which would be a negative impact. A positive impact to local and state tax revenues and local economies would result from construction-related jobs and expenditures. A small negative impact in property tax revenues would occur from BPA's purchase of land to locate the new substation.	No impacts to local populations are expected to occur. One residence would be relocated, which would be a negative impact. A positive impact to local and state tax revenues and local economies would result from construction-related jobs and expenditures.	Impacts would be similar to the Preferred Alternative. However, only one residence would be relocated.	Impacts would be similar to Alternative 1.	The No Action Alternative would not directly or indirectly impact the local population, economy, or tax base. However, this alternative would have other socio-economic impacts to the local area and greater region, as a result of the lack of adequate transmission line infrastructure to support expected growth in the Pacific Northwest.
Visual Resources (See Sections 3.9, *Visual Resources*, and 4.8, *Visual Resources*.)	The area's visual character and quality are primarily natural and rural. It is defined by rolling mountains, steep and dramatic mountain ranges, consistent stretches of scrub-steppe vegetation, and agricultural uses such as orchards, vineyards, and crop circles.	Visual impacts would be low to moderate. Segment A in the Colockum Pass area would pass close to a number of residences. The proposed structures would not dominate the view. The route through Segments D would be clearly visible to residents, tourists, and recreationalists in the Saddle Mountain area. B_{SOUTH} would parallel the John Wayne Trail and be visible to users of this recreational feature.	Visual impacts would be low to moderate. Impacts would be similar to the Preferred Alternative, except Segment E's location in the Saddle Mountain area is slightly further from most viewers than the Segment D alignment.	Visual impacts would be low to moderate. Impacts to the Colockum Pass area would be similar to the Preferred Alternative.	Visual impacts would be low to moderate. Impacts would be similar to the Preferred Alternative, except Segment F would cross the north face of the Saddle Mountains furthest from most viewers, and has a sensitive siting relationship with the Saddle Mountain Ridge.	No new impacts are expected.

Resource	Existing Conditions	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action
Recreation Resources (See Sections 3.10, *Recreational Resources*, and 4.9, *Recreational Resources*.)	Recreational activities in the area are dispersed.	Impacts to recreational resources would be low. No long-term effects to recreational resources are expected. All impacts would be temporary and related to construction.	Impacts would be low and similar to the Preferred Alternative.	Impacts would be low and similar to the Preferred Alternative.	Impacts would be low and similar to the Preferred Alternative.	No new impacts are expected.
Cultural Resources and Historic Properties (See Sections 3.11, *Cultural Resources and Historic Properties*, and 4.10, *Cultural Resources and Historic Properties*.)	Cultural resources and historic properties located within close proximity of the project's Area of Potential Effect (APE) include prehistoric camps and villages, prehistoric burial grounds, prehistoric caves, archaeological districts, lithic scatters, prehistoric stone tool quarries, historic homesteads, historic railroad sites, historic refuse scatters, traditional fishing locations, and traditional root-gathering areas.	Thirty-six recorded sensitive areas were identified in the Draft EIS literature review. Survey results identified 104 cultural resources within the APE; 66 are historic properties that are eligible or potentially eligible for listing on the National Register of Historic Places (NRHP). All known historic properties would be avoided.	Thirty-eight recorded sensitive areas were identified in the Draft EIS literature review. All sites important, no levels given.	Thirty-eight recorded sensitive areas were identified in the Draft EIS literature review. All sites important, no levels given.	Forty recorded sensitive areas were identified in the Draft EIS literature review. All sites important, no levels given.	No new impacts would occur.
Public Health & Safety (See Sections 3.12, *Public Health and Safety*, and 4.11, *Public Health and Safety*.)	Electric and magnetic fields are found around existing transmission lines. Corona-generated audible noise is present near existing transmission lines in the area. Hazardous and toxic materials are found in substation equipment and are used in maintenance activities.	Health and safety impacts would be low to moderate. Noise impacts would be low.	Impact would be similar to the Preferred Alternative.	Health and safety impacts would be low. Noise impacts would be low.	Impacts would be similar to Alternative 3.	No new impacts would occur.
Air Quality (See Sections 3.13, *Air Quality*, and 4.12, *Air Quality*.)	Air quality in the area is generally good. Wind-blown dust is the leading cause of diminished air quality.	Dust during construction activities would have a temporary low impact. There would be no long-term air quality impacts from this alternative.	Similar to Preferred Alternative.	Similar to Preferred Alternative.	Similar to Preferred Alternative.	No new impacts would occur.

Table 2.8-2
Comparison of Alternatives to Project Purposes

Purposes	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action Alternative
Maintain transmission system reliability	• Would provide another line north of the Hanford Substation. • Would connect two existing 500-kV lines and the new line to Wautoma Substation to reduce system impacts resulting from the potential loss of two existing lines south of the Hanford Substation. • Would create a new switching station for the 500-kV transmission grid.	• Would provide another line north of the Hanford Substation.	• Would provide another line north of the Hanford Substation. • Would connect the existing 500-kV lines and the new line to Wautoma Substation to reduce system impacts resulting from the potential loss of two existing lines south of the Hanford Substation. • Would create a new switching station for the 500-kV transmission grid. • BPA has concerns for the safety of a line built near the use of live ammunition.	• Would provide another line north of the Hanford Substation. • May increase the risk of losing the existing and new line north of the Hanford Substation.	• Transmission system would remain at the existing level of capacity and reliability.
Optimize System Usage	• Would reduce loading of existing transmission lines west of the Cascades by 170 MW. • Would facilitate the integration of new generation.	• Would reduce loading of existing transmission lines west of the Cascades by 140 MW. • Would facilitate the integration of new generation.	• Would reduce loading of existing transmission lines west of the Cascades by 170 MW. • Would facilitate the integration of new generation.	• Would reduce loading of existing transmission lines west of the Cascades by 140 MW. • Would facilitate the integration of new generation.	• Would not off-load the existing transmission lines west of the Cascades. • Would not facilitate the integration of new generation.
Minimize environmental impacts *(See Table 2.8-1, Summary of Impacts)*	• Would create the least environmental impacts of all alternatives. Segment D essentially expands existing ROW, reducing impacts to areas presently unaffected by transmission lines. Cumulative impacts would be less than constructing new roads in undisturbed areas.	• Would create more environmental impacts than the Preferred Alternative. Segment E would cause impacts by establishing a new ROW in the vicinity of, but not directly adjacent to, an existing ROW.	• Would create a similar level of environmental impacts as Alternative 1A. Segment C would be a new ROW through the YTC, causing impacts to plants and wildlife through the disturbance of the shrub-steppe ecosystem.	• Would create a similar level of environmental impacts as Alternative 3. Segment F would be a new ROW along the Saddle Mountains causing impacts to plants and wildlife through the disturbance shrub-steppe lands.	• Would not cause any construction-related environmental impacts. • This is the Environmentally Preferred Alternative.

Purposes	Preferred (2)	Alternative 1	Alternative 3	Alternative 1A	No Action Alternative
Minimize costs	Estimated cost of $107,000,000.	Estimated cost of $124,000,000. The increased cost would result from land costs to purchase of easements across farmland between Vantage and Hanford Substations.	Estimated cost of $94,000,000. This cost does not reflect all costs potentially associated with this alternative. No land costs were added to the estimate for the purchase of easements across the YTC. It is possible BPA would need to compensate the Army for the loss of the use of land used for maneuvers.	Estimated cost of $94,000,000. Segment F avoids much of the agricultural areas and thus reduces land costs.	No costs associated with this alternative.
Provide earliest energization date	Would meet the scheduled energization date of late 2004.	Would be difficult to meet the energization date. Acquiring easements across irrigated agricultural land could potentially delay the schedule. In addition, obtaining easements through Hanford Reach National Monument could also delay the schedule.	Would likely not meet the energization date due to Army reluctance to allow a new ROW to cross the military reservation. This land is also of high concern to the tribes.	Would be difficult to meet energization date. Obtaining easements through Hanford Reach National Monument could potentially delay the schedule.	Not applicable.

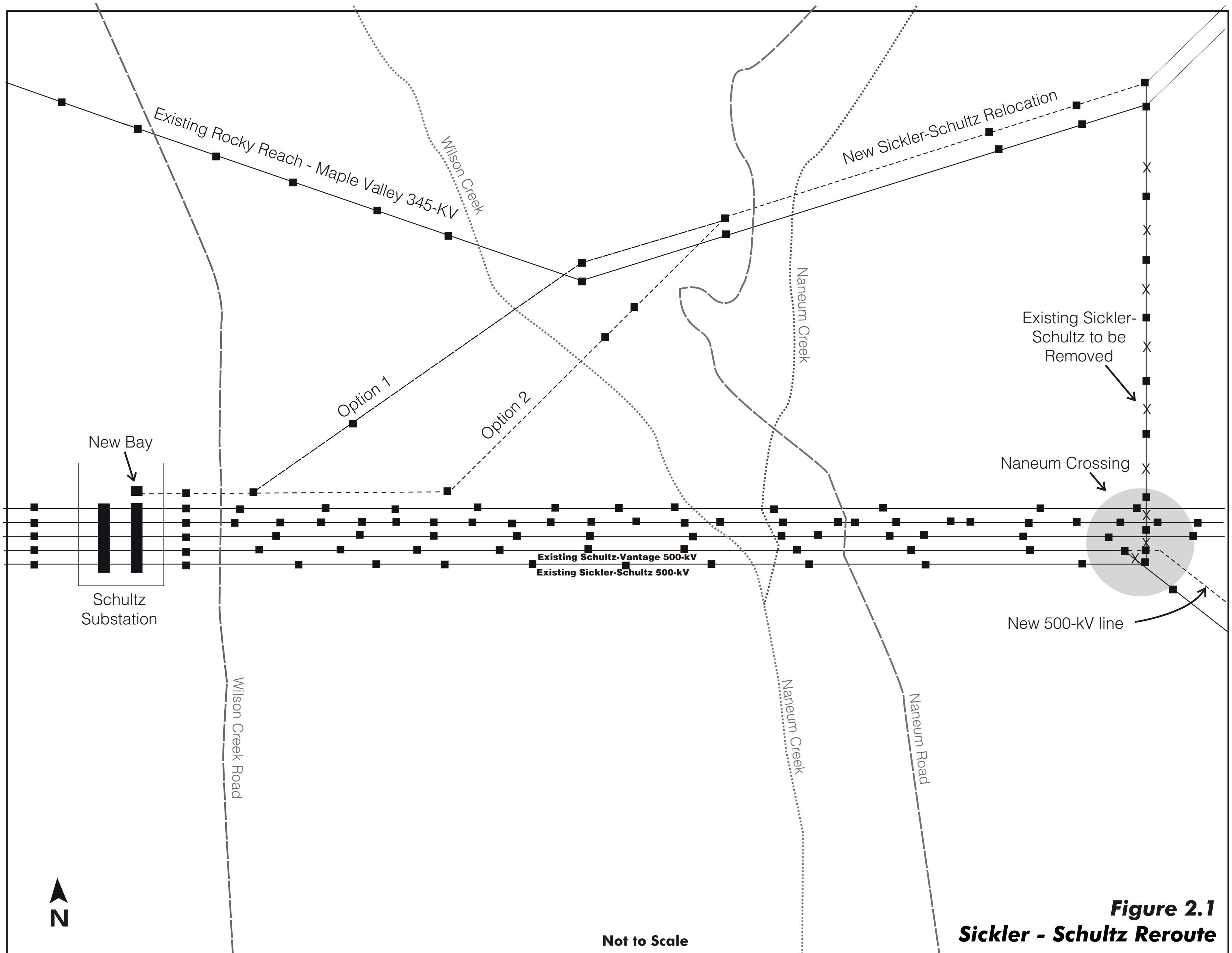

Figure 2.1
Sickler - Schultz Reroute

Chapter 3 — Affected Environment

In this Chapter:

- **Existing natural environment**
- **Existing human environment**
- **Protected resources**

This chapter describes the existing environment that may be affected by the alternatives. Each section describes a specific resource. The natural environment is discussed first, then the human environment.

Segments A through F, described in Chapter 2, *Alternatives*, and shown on Map 2, *Alternatives*, are used in most, but not all, of the resource discussions to help describe the existing environment.

3.1 Water Resources

3.1.1 Precipitation

Weather patterns in central Washington vary greatly with topography. Most of the study area is in the rain shadow of the Cascades, which results in a semiarid climate. Most precipitation in the study area falls as rain, with as little as 7 to 8 inches of precipitation per year at lower elevations. The amount of sediment in streams varies seasonally, and streams and rivers carry the most sediment when rain or snowmelts occur. Occasional intense summer rains also raise flows and the amount of sediment in rivers and streams.

3.1.2 Watersheds

River basins crossed by the project are the Central Columbia and Yakima. Within these basins the streams crossed by the line segments, including the fiber line from Vantage to Columbia, fall into six watersheds: the Lower Yakima, Upper-Columbia-Priest Rapids, Lower Crab, Upper Yakima, Upper Columbia-Entiat, and Moses Coulee. Some of the ***perennial streams*** crossed include Lower Crab Creek, Naneum Creek, and Wilson Creek, in addition to the Columbia River. (See Map 4, *Water Resources*.) Many smaller perennial and ***intermittent stream*** drainages and irrigation ditches may also be crossed. Table 3.1-1, *Potential Stream/Lake Crossings*, and Table 3.1-2, *Potential Stream/Lake Crossings Midway to Columbia Fiber Optic Route*, shows the stream crossings for each line segment and the associated watersheds.

For Your Information

*A **perennial stream** flows throughout the year.*

*An **intermittent stream** flows only seasonally.*

Table 3.1-1
Potential Stream/Lake Crossings

Perennial Stream Crossing	Watershed				
	Lower Crab	Lower Yakima	Upper Yakima	Upper Columbia Priest Rapids	Upper Columbia Entiat
Segment A					
Caribou Creek			■		
Coleman Creek			■		
Cooke Creek			■		
Naneum Creek			■		
Schnebly Creek			■		■
Wilson Creek			■		
Parke Creek			■		
Middle Canyon Creek					■
Segment B					
Columbia River					■
Johnson Creek					■
Segment C					
Alkali Creek				■	
Cold Creek		■			
Corral Creek				■	
Hanson Creek				■	
Johnson Creek					■
Segment D					
Cold Creek		■			
Columbia River				■	
Lower Crab Creek	■				
Segment E					
Columbia River				■	
Lower Crab Creek	■				
Nunnally Lake	■				
Saddle Mountain Lake				■	
Segment F					
Columbia River				■	
Lower Crab Creek	■				
Nunnally Lake	■				
Saddle Mountain Wasteway					■

Table has been updated for the FEIS.

Table 3.1-2
Potential Stream/Lake Crossings
Midway to Columbia Fiber Optic Route

		Watershed		
		Lower Crab	**Lower Yakima**	**Moses Coulee**
Perennial Stream Crossing	**Fiber Optic (Vantage to Columbia & Loop near Wautoma)**			
	Sand Hollow	■		
	Evergreen Reservoir	■		
	Burke Lake	■		
	H-Lake	■		
	Lynch Coulee	■		
	Moses Coulee			■
	Dry Creek		■	

Table has been updated for the FEIS.

The study area lies at the western edge of the Interior Columbia Basin. The area lies in the rain shadow of the Cascade Mountains, and thus receives very little precipitation. With the exception of the Columbia River, which bisects the study area, water is scarce. Streams are generally small and intermittent. The northern part of the study area near Ellensburg and including Segment A drains into the Yakima River. The remainder of the project (Segments B, C, D, E, and F) contains a number of local drainages that drain directly into the Columbia River.

Most streams crossed in Segment A are part of the Wilson-Naneum Creek sub-basin, a part of the Yakima basin. Streams in this sub-basin are heavily diverted on the Kittitas valley floor and have been channelized into an intricate drainage\irrigation system. There are over 200 unscreened diversions in this drainage (WDFW, 2001). Grazing and other agricultural practices extensively impact the riparian zone of the valley portions of these streams. In their upper reaches, these streams flow through timbered canyons with good year-round flows. One perennial drainage, Middle Canyon Creek drains the northeastern corner of the YTC. Extensive past grazing, military maneuvers, and other disturbances have caused changes in water flow and a general reduction in the quality of fish habitat within the two perennial drainages.

Segment B crosses one perennial drainage and the Columbia River between the northern end of Segment C and the Vantage Substation. Johnson Creek drains the northeastern corner of the YTC. Extensive past grazing, military maneuvers, and other disturbances have caused changes in water flow and a general reduction in the quality of fish habitat within the two perennial drainages.

For Your Information

Regime *refers to the pattern and direction of the flow of the river.*

In Segment C, extensive past grazing, military maneuvers, and other disturbances have caused changes in flow ***regimes*** and a general reduction in the quality of fish habitat within the two perennial drainages crossed. In recent years, severe fires have damaged riparian vegetation and reduced the amount of vegetative cover on upland areas.

3.1.2.1 Water Quality

The Lower Yakima and Upper Columbia-Priest Rapids are identified as having serious water quality problems, such that aquatic conditions are well below state and tribal water quality goals (EPA, 2000). The remaining three watersheds (Lower Crab, Upper Yakima, and Upper Columbia-Entiat) have less serious problems, although their aquatic conditions are also below state or tribal water quality goals (EPA, 2000). Lower Crab Creek, Mattawa Drain, Sand Hollow and the Columbia River are listed as ***water quality limited*** under Section 303(d) of the Federal Clean Water Act, due to extensive habitat modification. Corrective actions may currently be underway for these water bodies. It is possible that they are in compliance with state water quality standards, despite the fact that they are presently listed as water quality limited.

water quality limited *under Section 303(d) of the Federal Clean Water Act refers to streams that do not meet current water quality standards.*

Table 3.1-3, *303(d) – Listed Water Bodies*, lists the parameters of concern for the 303(d)-listed water bodies in the study area. Data for this table were taken from the Washington State Department of Ecology's Final 1998 Section 303(d) List of Impaired and Threatened Waterbodies provided to the U.S. Environmental Protection Agency (EPA).

Table 3.1-3
303(d) – Listed Water Bodies

	Water Quality Parameters						
	pH	Temperature	PCB	DDE	Dissolved Gas	Dissolved Oxygen	Fecal Coliform
Columbia River	■				■		
Crab Creek	■	■	■	■			
Mattawa Drain		■					
Sand Hollow	■	■					

Source: Washington Department of Ecology 1998
Table has been updated for the FEIS.

PCB: *A family of industrial chemical compounds, noted as an environmental pollutant that accumulates in animal tissue.*

DDE: *A product of the metabolic breakdown of DDT by an organism.*

Acronyms are listed in Chapter 10.

3.1.2.2 Shorelines

The Washington State Shoreline Management Act allows for cities or counties to guide the planning and management necessary to prevent the potential harmful effects of uncontrolled development along the shorelines of Washington State. It is based on the idea that the shorelines of the State are among the most valuable natural resources and unrestricted development is detrimental to the preservation of these resources.

For Your Information

Shorelines are lakes, including reservoirs, of 20 acres or greater; streams with a mean annual flow of 20 cubic ft per second or greater; marine waters; plus an area landward 200 ft from the ordinary high water mark of the resource; and all associated marshes, bogs, swamps, and river deltas.

The various line segments cross one river (Columbia), two creeks (Naneum and Lower Crab), and one lake (Nunnally) that have been designated as shorelines. Table 3.1-4, *Shorelines Crossed*, lists the shoreline, the line segment(s) that cross it and the jurisdiction.

Table 3.1-4
Shorelines Crossed

Shoreline	Line Segment	County
Naneum Creek	A	Kittitas
Columbia River	B	Kittitas, Grant
Nunnally Lake	E and F	Grant
Lower Crab Creek	D, E, and F	Grant
Evergreen Reservoir	Fiber Optic Vantage - Columbia	Grant
Quincy Lake	Fiber Optic Vantage - Columbia	Grant
Burke Lake	Fiber Optic Vantage - Columbia	Grant
Moses Coulee	Fiber Optic Vantage - Columbia	Douglas

Table has been updated for the FEIS.

See Map 4,Water Resources, for locations of water bodies.

Naneum Creek is crossed by Segment A in Section 20 and 21 of T19N R19E in Kittitas County. The environmental designation of the shoreline in this area is Rural, and is characterized primarily by agricultural activities with some compatible recreational uses.

In Kittitas County, Segment B crosses the west shore of the Columbia River in Section 20 of T16N R23E. The environmental designation of this area is Conservancy, which is characterized by uses primarily related to natural resource use. Recreational uses and low intensity recreational homes may be found within this designation. In Grant County, on the east side of the river (Section 21 of T16N R23E), the environmental designation of the shoreline is Rural.

Southeast of the Vantage Substation, Segments E (in Sections 25 and 36 of T16N R23E) and F (in Section 35 of T16N R23E) cross Nunnally Lake. This lake has a shoreline designation of Conservancy due to the lack of development around the lake.

Just south of Nunnally Lake is Lower Crab Creek. This east-west oriented creek is crossed by all three alternatives in Grant County, Segments D (in Section 2 of T15N R23E), E (in Section 2 of T15N

R23E), and F (in Section 36 of T16N R23E). The environmental designation of the shoreline at all three of these crossings is Conservancy due to the lack of development around these areas of the creek.

Segments D, E, and F cross the Columbia River in the Hanford Reach National Monument (Segment D in Section 11 T13N R24E and Segment E and F in Sections 28 and 29, T14N, R26E). The Grant County and Benton County Shoreline Master Programs do not apply to the Columbia River in this area due to it being federal land. Therefore, the Columbia River is not considered a shoreline of statewide significance at these crossings.

The fiber optic line between the Vantage and Columbia substations would cross the Evergreen Reservoir (Section 22, T19N, R23E), and Quincy and Burke Lakes (Section 15, T19N, R23E) in Grant County and Moses Coulee (Section 27, T21N, R22E) in Douglas County. The Evergreen Reservoir and Quincy and Burke Lakes have a shoreline designation of Conservancy due to the lack of development, physical features and ownership by State and Federal governments. Moses Coulee is designated Rural due to the minimal development near and within its shoreline.

For Your Information

*An **aquifer** is a layer of underground sand, gravel, or spongy rock in which water collects.*

3.1.2.3 Aquifers

Aquifers between Miocene basaltic rocks are prominent in the Columbia Plateau basaltic aquifer system. These aquifers consist of numerous flows of basaltic lava. Permeable zones between the lava flows form these aquifer layers. Groundwater quality in the proposed study area is variable, depending on the layer of basalt from which the groundwater is taken. Groundwater quality issues are mostly due to elevated concentrations of nutrients, trace organic compounds, and sodium and nitrates (USGS, 1991 & Kevin Lindsay, May 23, 2001). Nitrates found in the groundwater are mostly associated with irrigated farming areas. The Columbia Plateau basaltic aquifer system is a major source of water for municipal, agricultural, and domestic uses (USGS, 1991).

3.2 Floodplains and Wetlands

3.2.1 Floodplains

The Federal Emergency Management Agency (FEMA) identifies areas that have a one-percent chance of being flooded in a given year as 100-year floodplains. Areas identified as 100-year floodplains are shown on Flood Insurance Rate Maps. Areas where line segments would cross floodplains shown on FEMA maps are listed in Table 3.2-1, *Potential Crossings of 100-Year Floodplains*, and shown on Map 4, *Water Resources*.

Table 3.2-1
Potential Crossings of 100-Year Floodplains

Water Feature	Line Segments						
	A	B	C	D	E	F	V-C* Fiber Optic Line
Wilson/Naneum Creek crossings	■						
Cooke Creek	■						
Columbia River crossings		■		■	■	■	
Lower Crab Creek				■	■	■	
Nunnally Lake					■		
Dry Creek			■	■			
Mosses Coulee							■
Lynch Coulee							■
Quincy Lakes							■
Un-named Creek							■
Sand Hollow Creek							■

* Vantage-Columbia.
Table has been updated for the FEIS.

The main water feature in the study area is the Columbia River. The 100-year floodplain is relatively narrow along the Columbia River because dams in the study area regulate flows. The largest flood in recent times occurred in 1948; it is very unlikely that large scale flooding would recur because of the construction of several flood-control/water-storage dams upstream of the study area since 1948.

Several FEMA floodplain areas are located in Segment A. In the Sickler-Schultz relocation area, Naneum and Wilson Creeks meander near each other eventually joining just south of the existing Schultz-Vantage line (See Figure 2.1, Sickler-Schultz Reroute.) Near their intersection the two creeks essentially share one floodplain area, which is broad tree and shrub lined containing the braided channels of both creeks. At the northern crossing of Naneum Creek, the floodplain is located within a narrow canyon. The Cooke Creek floodplain crossing consists of several narrow, rocky creek channels in a fairly level area.

Segment B would cross the Columbia River south of Wanapum Dam and north of Priest Rapids Dam. See Map 4, *Water Resources*. In this portion of the river, the river is impounded and flows are regulated by discharges at Wanapum Dam. The structures on existing BPA transmission lines near the area where Segment B would cross are all outside the 100-year floodplain.

At the southern end of Segments C and D, the Dry Creek floodplain is located immediately to the south of the proposed Wautoma substation. The substation would be located outside of the area mapped as the 100-year floodplain along Dry Creek although one existing BPA structure is located within the floodplain.

Segments D, E, and F would cross the Columbia River downstream from Priest Rapids Dam. This portion of the Columbia River is the only unimpounded stretch of the Columbia River in the United States. Known as the Hanford Reach, flows fluctuate considerably but they are controlled by releases from Priest Rapids Dam. Existing BPA transmission lines span the Columbia River near each of the proposed crossings and all existing BPA structures are located outside the 100-year floodplain.

Two additional floodplains within the study area are identified on FEMA floodplain maps: Nunnally Lake, located north of Lower Crab Creek along Segment F; and the main channel of Lower Crab Creek crossed by Segments D, E, and F.

The fiber optic line between Vantage and Columbia would cross 5 floodplains as identified on the FEMA floodplain maps. The fiber line would cross the Sand Hollow floodplain, located adjacent to Highway 26, an unnamed creek just 2 miles north of Interstate 90, the Quincy Lakes within the Quincy Wildlife Area, Lynch Coulee near Highway 28, and Mosses Coulee near the Burlington Northern line and Highway 28.

3.2.2 Wetlands

Wetlands are uncommon within the shrub-steppe areas of eastern Washington. Wetlands found in this area typically are supported by water sources such as springs, surface runoff, and riparian areas. The presence of wetlands in the study area (defined as 500 feet either side of the proposed line) was initially investigated using National Wetlands Inventory (NWI) maps. NWI maps depict natural and human-made wetlands and other special aquatic features.

NWI mapped wetland and other special aquatic features were identified within the study area and are summarized below and shown on Map 5, *Wetlands/Plant Associations*. Of the NWI features identified, most do not meet the technical definition of wetlands used for regulatory purposes. Only the Preferred Alternative was field verified for wetlands. If another alternative is chosen, field studies would be needed to verify the presence of wetlands.

3.2.2.1 Segment A

Fifteen NWI mapped features in Segment A are associated with either intermittent or perennial creeks (See Table 3.2-2, *Wetlands Located Along Segment A*). With the exception of Wilson, Naneum, and Cooke Creeks, all are located along narrow drainages, with a narrow band of vegetation. The field survey verified the presence of six wetlands. Five are associated with creeks (shown in bold in Table 3.2-2) while one is associated with an ephemeral drainage.

Naneum and Wilson Creeks would both be crossed twice. In the crossing to the north (Sickler-Schultz Reroute) the two creeks are separated by approximately 0.5 mi. Naneum Creek has a narrow band of ***emergent wetlands*** associated with it in the area of the proposed crossing, and Wilson Creek has several braided channels in the area of the proposed line. One of these channels of Wilson Creek has a narrow band of ***forested wetland***, the other channels are emergent wetlands.

Naneum and Wilson Creeks flow very close to each other in the crossing to the south at the existing Vantage-Schultz crossing. Field survey found ***scrub-shrub and emergent wetland*** vegetated with scattered shrubs, wavy-leaved alder, bittercherry, and occasional black cottonwoods.

Cooke Creek runs through a fairly level area and it consists of several narrow, rocky creek channels. The dominant woody species along Cooke Creek are black cottonwood, black hawthorn, and willows.

For Your Information

Emergent wetlands *are wetlands dominated by herbaceous plants.*

Forested wetlands *are wetlands with a tree canopy.*

Scrub-shrub wetlands *are wetlands dominated by shrubby plants and low-growing woody species with multiple stems.*

Table 3.2-2
NWI Features Located Along Segment A

Feature	Location	NWI Classification
Naneum Creek (north crossing)	T19N -R19E-20	riverine, palustrine, emergent, seasonally to permanently flooded
Wilson Creek (north crossing)	T19N -R19E-20	palustrine, emergent, seasonally flooded
Naneum/Wilson Creek crossing	T19N -R19E-20	palustrine, emergent and scrub-shrub, seasonally flooded, or riverine, open water, permanently flooded
Cave Canyon Creek	T19N -R19E-28	palustrine, scrub-shrub wetland, seasonally flooded
Creek	T19N -R19E-27	riverine, seasonally flooded
Charlton Canyon Creek	T19N -R19E-27	riverine, seasonally flooded
Tributary of creek in Charlton Canyon	T19N -R19E-27	riverine, temporarily flooded
Creek in Schnebly Canyon	T19N -R19E-26	palustrine, scrub-shrub wetland, seasonally flooded
Coleman Creek	T19N -R19E-36	3 channels designated as riverine, open water, permanently flooded
Cooke Creek	T18N -R20E-6	palustrine, forested wetland, seasonally flooded
Trail Creek	T18N-R20E-5	riverine, seasonally flooded
Caribou Creek	T18N -R20E-8	palustrine, emergent wetland, seasonally to permanently flooded
Tributary of Caribou Creek	T18N -R20E-16	About 0.5 mile to the north: riverine, seasonally flooded About 0.5 mile to the south palustrine, scrub-shrub wetland, seasonally flooded
Parke Creek	T18N -R20E-27	riverine, seasonally flooded
Creek	T17N -R21E-20	palustrine, emergent wetland, with persistent vegetation, temporarily flooded

Field survey found wetlands associated with the features in **bold**. One additional wetland associated with an ephemeral drainage not found on the NWI maps was also located.
Table has been updated for the FEIS.

➡ **For Your Information**

Palustrine wetlands *are nontidal wetlands dominated by trees, shrubs, persistent emergents, mosses and lichens.*

Riverine wetlands *are any wetland or deepwater habitat contained within a stream channel.*

3.2.2.2 Segment B

Option B$_{NORTH}$ – The NWI map identifies two narrow wetlands along Option B$_{NORTH}$ are associated with two creeks, Johnson Creek and an unnamed creek (See Table 3.2-3, *NWI Features Located Along Option B$_{NORTH}$*). The associated wetland at Johnson Creek is classified an emergent wetland and the wetland at the unnamed creek is classified as a riverine system. The Columbia River is noted on the NWI maps as a lake, but does not have wetlands on either side of it; rather a sparse upland plant community dominated by rabbitbrush and ***forbs*** grows almost to the edge of the water with occasional willows next to the water.

Forbs *are herbaceous species other than grass.*

Table 3.2-3
NWI Features Located Along Option B_{NORTH}

Feature	Location	NWI Classification
Johnson Creek	T16N-R22E-15	palustrine, emergent wetland, persistent vegetation, temporarily flooded
Unnamed Creek	T16N-R22E-23	riverine, seasonally flooded
Columbia River	T16N-R23E-20	lake, **limnetic**, open water, permanently flooded, and diked/impounded

Table has been updated for the FEIS.

For Your Information

Limnetic *is an open water zone of a water body too deep to support rooted aquatic vegetation.*

Option B_{SOUTH} – According to the NWI, three narrow riverine wetlands are associated with tributaries of Johnson Creek along Option B_{SOUTH} (See Table 3.2-4, *NWI Features Located Along Option B_{SOUTH}*). The Columbia River crossing is described in Option B_{NORTH} above. The field survey verified that no wetlands exist within this segment.

Table 3.2-4
NWI Features Located Along Option B_{SOUTH}

Feature	Location	NWI Classification
Tributary of Johnson Creek	T16N-R22E-21	riverine seasonally flooded
Tributary of Johnson Creek	T16N-R22E-22	riverine, seasonally flooded
Tributary of Johnson Creek	T16N-R22E-23	riverine, seasonally flooded
Columbia River	T16N-R23E-20	lake, limnetic, open water, permanently flooded, and diked/impounded

Table has been updated for the FEIS.

3.2.2.3 Segment C

Along Segment C there are 12 features crossed. (See Table 3.2-5, *NWI Features Located Along Segment C*). The NWI indicates that these creeks have a narrow band of wetland vegetation, with an abrupt transition to upland communities.

One scrub-shrub wetland occurs in Corral Canyon on the YTC. The YTC Management Plan describes scrub-shrub wetlands on YTC as generally dominated by willows, which may be associated with other shrub species including chokecherry, mock orange, Wood's rose, and red-osier dogwood (USDOA, 1996).

Five emergent wetlands are mapped in the YTC portion of Segment C. Emergent wetlands on YTC are typically dominated by rushes, cattails, sedges, saltgrass, rabbitsfoot grass, mint, stinging nettle, and teasel (USDOA, 1996).

The remaining wetlands in Segment C include seven riverine wetlands, all characterized as intermittent, with a definite streambed. These areas may be riparian in nature. It is not known if any seeps or springs occur in the area of Segment C.

YTC has analyzed the condition of riparian areas and examined human activities that have had detrimental effects on water resources (USDOA, 1996). Past grazing has had the greatest effect on riparian/ wetland systems in the Cold Creek, Hanson, Johnson, and Middle Canyon drainages. Fire has had the greatest effect within the Corral Canyon drainage. The Alkali Canyon drainage has been affected by both fire and grazing. YTC has initiated riparian restoration projects that have improved riparian conditions in the study area.

Table 3.2-5
NWI Features Located Along Segment C

Feature	Location	NWI Classification
Johnson Creek	T16N-R22E-20	palustrine, emergent wetland, with persistent vegetation, seasonally flooded
Hanson Creek	T15N-R22E-8	palustrine, emergent wetland, with persistent vegetation, seasonally flooded
Cottonwood Creek	T15N-R22E-21	riverine, seasonally flooded, mapped to the east of the proposed line; palustrine, emergent wetland, with persistent vegetation, seasonally flooded, mapped to the west
Unnamed creek	T15N-R22E-28	riverine, seasonally flooded (includes two forks of the creek)
Creek in Alkali Canyon	T14N-R22E-3	palustrine, emergent wetland, with persistent vegetation, seasonally flooded
Creek in Corral Canyon	T14N-R22E-15	palustrine, scrub-shrub wetland, with broadleaf deciduous vegetation, temporarily flooded
Tributary to creek in Corral Canyon	T14N-R22E-14	palustrine, emergent wetland, with persistent vegetation, seasonally flooded
Tributary to creek in Corral Canyon	T14N-R22E-23	riverine, seasonally flooded
Creek in Sourdough Canyon	T14N-R22E-25	riverine, seasonally flooded
Cold Creek	T13N0-R23E-20	riverine, seasonally flooded
Tributary to Cold Creek	T13N-R23E-35	riverine, seasonally flooded
Dry Creek	T12N-R24E-20	riverine, seasonally flooded

Table has been updated for the FEIS.

3.2.2.4 Segment D

The NWI maps depict six features crossed by Segment D (See Table 3.2-6, *NWI Features Located Along Segment D*). The field survey verified the presence of one wetland along this segment, associated with Lower Crab Creek.

One NWI feature is a wide band of emergent wetlands on the north side of Lower Crab Creek approximately 50 feet wide. To the south of Lower Crab Creek, a wetland designated as open water, excavated area, is fed by irrigation outflow. The plant community in this area is mostly weedy species, with some natives (Beck, 2001).

Segment D spans the Columbia River. The NWI classifies it as lacustrine open water with no wetlands associated with it on either side.

South of the Columbia River, two narrow wetlands are associated with Cold Creek and an unnamed creek. Both of these areas are riverine systems, with a definite streambed and intermittent flow.

Similar to Segment C, Segment D would end at the site of the proposed Wautoma Substation. No wetlands were found on the substation site.

Table 3.2-6
NWI Features Located Along Segment D

Feature	Location	NWI Classification
Lower Crab Creek	T15N-R23E-2	palustrine emergent wetland, persistent vegetation, seasonally to permanently flooded
Wetland	T14N-R24E-5	palustrine, open water, semi-permanently flooded, excavated
Columbia River	T13N-R24E-11	**lacustrine**, open water, permanently flooded; no adjacent wetlands on shore
Cold Creek	T13N-R24E-34	riverine, seasonally flooded
Unnamed Creek	T13N-R24E-34	riverine, seasonally flooded
Dry Creek	T12N-R24E-Sec 20	riverine, seasonally flooded

Table has been updated for the FEIS.

For Your Information

***Lacustrine wetlands**, lakes, reservoirs or any standing water body with a total surface area exceeding 20 acres.*

3.2.2.5 Segment E

Ten features are indicated on the NWI maps that are crossed by Segment E (See Table 3.2-7, *NWI Features Located Along Segment E*).

To the north of Lower Crab Creek, a large wetland area is fed by an outflow channel from Nunnally Lake. In this wetland ***complex***, emergent wetlands are located in the area of the proposed line. Two emergent wetlands that are not connected to a watercourse are also located to the north of Lower Crab Creek. Along Lower Crab Creek, the NWI map depicts a wide band of emergent wetlands on the north side of the creek channel.

*A **complex** is a specific watershed area within the YTC. The YTC is divided into ten complexes.*

Within agricultural areas, four irrigation ditches have a riverine designation. Some appear to be historic creek channels, based on some natural looking meanders, while other areas appear to be straightened and may function as irrigation ditches.

A large wetland area known as the Saddle Mountain Wasteway is located immediately to the north of the Columbia River. A berm separates the river from this wetland so typically there is no surface water connection, but some years in late summer there is surface flow to the river. The water feeding this wetland originates in irrigation ditches to the northeast. The irrigation outflow enters Saddle Mountain Lake, then leaves the lake through a stream channel, flowing into the Saddle Mountain Wasteway, and then on to the Columbia River. Some of the wetland has been excavated; while other areas are labeled as either riverine or emergent wetlands.

Where segment E crosses the Columbia River there are no adjacent wetland areas at the edge of the river.

Table 3.2-7
NWI Features Located Along Segment E

Feature	Location	NWI Classification
Wetland	T16N-R23E-35	palustrine, emergent, persistent vegetation, seasonally flooded
Wetland	T16N-R23E-Sec 35	palustrine, emergent, persistent vegetation, seasonally flooded
Wetland fed by outflow channel from Nunnally Lake	T16N-R23E-Sec 35	lacustrine, littoral, unconsolidated bottom, permanently flooded and diked/impounded
Lower Crab Creek	T15N-R23E-2	palustrine, emergent wetland, with persistent vegetation, seasonally to permanently flooded
Irrigation ditch	T15N-R24E-25	riverine, artificially flooded, seasonally flooded, excavated
Irrigation ditch	T15N-R25E-31	riverine, excavated
Irrigation Ditch	T15N-R25E-11	palustrine, open water, semi-permanently flooded, excavated
Irrigation Ditch	T14N-R26E-11	riverine, artificially flooded, seasonally flooded, excavated
Saddle Mountain Wasteway	T14N-R26E-20	riverine, semipermanently flooded
	T14N-R26E-20 & 29	palustrine, emergent, with persistent vegetation, seasonally flooded
Columbia River	T14N-R26E-29 & 28	riverine.

Table has been updated for the FEIS

3.2.2.6 Segment F

Segment F has nine features mapped by the NWI (See Table 3.2-8, *NWI Features Located Along Segment F*).

North of Lower Crab Creek, Nunnally Lake is mapped as an open water, lacustrine wetland. The NWI does not map adjacent wetland areas along the margins of the lake, as verified in the field through an aerial survey. A narrow band of shrubs and trees, probably black cottonwoods and willows, lines the edge of the lake and the plant community abruptly transitions to upland shrub-steppe.

Two emergent wetlands, located to the north of Lower Crab Creek, appear to be isolated wetlands that are not connected to a watercourse. Along Lower Crab Creek, the NWI depicts a wide band of emergent wetland north of the creek channel.

The intermittent creeks that drain down the south slope of the Saddle Mountains do not have adjacent wetland according to the NWI. At the base of the Saddle Mountains, an irrigation ditch is mapped on the NWI.

Two wetland areas occur on the Saddle Mountain Unit of the Hanford Reach National Monument. One is a narrow emergent wetland that was observed in the field and is not mapped on the NWI (St. Hilaire, 2001). The large wetland area to the north of Columbia River (Saddle Mountain Wasteway) and the Columbia River crossing are described under Segment E (See Section 3.2.2.5, *Segment E*).

Table 3.2-8
NWI Features Located Along Segment F

Feature	Location	NWI Classification
Nunnally Lake	T16N -R23E-25 & 36	lacustrine, limnetic, open water/unknown bottom, permanently flooded
Wetland	T16N -R23E-36	palustrine scrub-shrub wetland/emergent wetland with persistent vegetation, seasonally flooded
Wetland	T16N -R23E-36	palustrine, emergent wetland with persistent vegetation, seasonally flooded
Adjacent wetland north of Lower Crab Creek	T16N -R23E-36	palustrine, emergent wetland with persistent vegetation, seasonally flooded
Lower Crab Creek	T16N -R23E-36	riverine, lower perennial, open water, permanently flooded
Irrigation Ditch	T15N -R26E-21 & 28	palustrine, open water, semi-permanently flooded, excavated
Wetland	T14N -R26E-16 & 21	palustrine, emergent wetland
Saddle Mountain Wasteway	T14N -R26E-20	riverine, semipermanently flooded
	T14N -R26E-20 & 29	palustrine, emergent, with persistent vegetation, seasonally flooded
Columbia River	T14N -R26E-29 & 28	Riverine

Table has been updated for the FEIS.

For Your Information

Physiography *is the study of the structure and phenomena of the earth's surface.*

Rivers that have carved a path through the bedrock of an area are ***incised****.*

Anticline *is an arching fold in layered rocks.*

Miocene *is the period in the Neogene lasting from 23 million years ago to 5 million years ago.*

The ***Columbia River Basalt Group****, composed of the Grand Ronde Basalt and the overlying Wanapuma and Saddle Mountains Basalt, comprises most of the aquifer system (USGS 1994).*

Neogene *is the geological period lasting from 23 million years ago to present day.*

Forage *is food for domestic animals, i.e. cattle, sheep, etc.*

Loess *is a windblown deposit of fine-grained silt or clay.*

Residuum *is unconsolidated weathered mineral material that accumulated as consolidated rock and disintegrated in place.*

Alluvium *is sedimentary material deposited by flowing water as in a delta or riverbed.*

Colluvium *is soil and/or rock fragments moved by creep, slide, local wash and deposited at the base of steep slopes.*

3.3 Soils and Geology

Diverse landforms and geologic features exist within the study area, which is in the Columbia Plateau ***physiographic*** province. The landscape within the plateau consists mostly of large and small hills with flat tops, extensive plateaus, ***incised*** rivers, and ***anticline*** ridges. The ***Miocene Columbia River Basalt Group*** underlies the region and is interbedded by ***Neogene*** terrestrial sediments (DNR, 1991).

The seismicity of the Columbia Plateau is relatively low compared to other regions in the Pacific Northwest. In 1936, the town of Milton-Freewater experienced an earthquake with a Richter scale magnitude of 5.75. This is the largest recorded earthquake known to have occurred in the Columbia Plateau (USDOE, 1999). Closer to the Hanford Site near the central part of the Columbia Plateau, an earthquake with a 4.4 Richter scale magnitude occurred in 1918 and again in 1973. These earthquakes were located near Othello, north of the Hanford Site, and are the largest recorded earthquakes that have occurred near the Hanford Site (USDOE, 1999).

Geologic hazards in the study area include steep slopes and erosion. Soil blowing and water erosion are the most active erosion processes due to the area's high relief, steepness of slope, and restricted available water capacity for the production of ***forage*** (USDA, 1984).

From the Schultz Substation at an elevation of 2,300 feet, Segments A, B_{NORTH}, and B_{SOUTH} would cross a broad plateau that extends to the Saddle Mountains in the northern portion of the YTC. Soils from the Schultz Substation to the Vantage Substation vary from shallow to deep, are well drained, and formed in a variety of parent materials including ***loess***, ***residuum***, ***alluvium***, and basaltic ***colluviums*** (Remote Sensing, 1998).

From the northern portion of the YTC, the landscape is characterized by ridges and valleys (the Saddle Mountains, Umtanum Ridge, and the Yakima Ridge) that were from the underlying basalt layers being folded and faulted. These ridges and valleys were further modified by glaciers and flooding (USDOD Army, 1996). Alluvial and wind-blown deposits of loess blanket the majority of the YTC.

From the Vantage Substation (elevation 900 feet) in Grant County, the area is generally smooth and southward sloping. The southward-sloping plain is deeply dissected and interrupted by the Saddle Mountains (approximate elevation 2,300 feet), and Crab Creek runs along its base (USDA, 1984). The Saddle Mountains are primarily made of basalt that has buckled into anticlines that trend in an east to west direction (Alt, 1994). These mountains had considerable faulting in their geologic past. The slopes to the south of the mountains are gentle in comparison to the bold relief of the north-facing cliffs. North of the Vantage Substation the area is characterized by benches, terraces and ridge tops throughout areas of channeled scablands.

Soils in the Saddle Mountain range from deep and well drained to very shallow with rock outcrops. Deep soils are found mostly on the upland flat benches or on areas with rolling topography. Shallow soils are predominantly found on steep north- and south-facing slopes and ridge tops. The east-facing slopes tend to have deeper soils than the west-facing slopes, due to prevailing winds that deposit sand and silt on the leeward side of the hills (BLM, 1997).

From the top of the Saddle Mountains the Wahluke Slope trends southward to the Columbia River and the Hanford Site. This slope is relatively flat-bottomed. The Wahluke Slope's soils are deep, well drained, and nearly level. The soils were formed from a variety of parent materials including gravelly glacial outwash, sand derived from mixed sources, and ***lacustrine deposits*** (USDA, 1984).

For Your Information

Lacustrine deposits *are material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.*

Low-relief plains and the Yakima Ridge dominate the Hanford Site. Several enormous floods modified the topography of the Hanford Site, when ice dams in western Montana and northern Idaho breached, emptied their entire contents, and spread across eastern Washington. This flooding, which is known as the Missoula Floods, occurred between 12,700 and 15,300 years ago (WSDNR website) and left sediments and a mix of topography that is now known as the Channeled Scablands (USDOE, 1999).

For Your Information

The study area for vegetation includes an area approximately 0.25 mile on either side of each of the proposed segments, for a total of a 0.5-mile-wide strip centered on the proposed segment. Factors that influence the distribution of plant communities include aspect, slope, elevation, moisture source, and duration, and the type of soils, including rock content, and soil depth. The common names of plant species, rather than scientific names, are used in the discussion of vegetation that follows.

Plant communities *(also known as plant associations) are assemblages of species that grow together in similar habitats and are found repeated across the landscape.*

3.4 Vegetation

The study area lies within the Columbia River Basin province of eastern Washington and Oregon (Franklin and Dyrness, 1973). The ***plant community*** found in most of the study area is referred to as shrub–steppe. The scientific name for each plant species discussed below is listed in a table in Appendix F, *Rare Plant Survey for the Preferred Alternative*. With the exception of several riparian areas, there are few trees in the study area. The dominant woody vegetation on most upland sites consists of shrub species, predominantly sagebrush species. The understory of herbaceous plants in shrub-steppe was dominated by native perennial bunchgrasses prior to European settlement. Within portions of the study area, native bunchgrass-dominated communities are no longer as common due to invasive annual grasses and non-native weedy species which colonize and spread after various types of disturbance (Quigley, 1999). In general, however, the majority of the vegetation communities within the study area are in fair to good condition.

Shrub-steppe vegetation in the study area is characterized as a potential big sagebrush/ bluebunch wheatgrass zone (Daubenmire, 1970). This is the community that is expected to occur without disturbance, alteration of habitat, or invasion by non-native species. Dominant shrubs in upland areas commonly include big sagebrush, threetip sagebrush, stiff sagebrush, bitterbrush, spiny hopsage, gray rabbitbrush, green rabbitbrush, and buckwheat species. In many areas today, non-native species, including cheatgrass, are now co-dominant with the shrubs. Other areas still have a bunchgrass layer of good quality. Common bunchgrass species include bluebunch wheatgrass, Sandberg's bluegrass, Cusick's bluegrass, Indian ricegrass, needle-and-thread grass, and Thurber's needlegrass.

While several riparian areas in the study area have a tree overstory, shrub-lined riparian areas are more common. These riparian areas typically have a narrow margin of upland shrubs, including black hawthorn, red-osier dogwood, mockorange, serviceberry, and big sagebrush. Invasive tree species, such as Russian olive, Siberian elm, and white mulberry grow in some riparian areas and wet areas.

The agricultural lands near the study area are irrigated croplands, vineyards and orchards. There may be small adjacent areas that may have some remnants of native plant communities. These remnants typically have low biodiversity and are very weedy.

Historic and present day causes of disturbances to vegetation in the study area include conversion of land to agricultural uses, grazing, fire, construction, road building, the deliberate and inadvertent introduction of non-native species, and maneuver training exercises on the YTC. Disturbance reduces native plant species cover and diversity, changes species composition and structure, and increases the likelihood of invasion by non-native species (Rickard, 1988). Native bunchgrasses and native forbs are particularly vulnerable to disturbances and have decreased dramatically in most portions of the shrub-steppe in Washington.

3.4.1 Vegetation Cover Types

Information on vegetation cover types in the study area was obtained from a variety of sources. Federal agencies provided information on plant communities that occur on the lands they manage. The plant communities within the project segments that traverse the Hanford Reach National Monument have been mapped. The botanist from the Wenatchee BLM District provided general information on plant communities that occur along BLM lands. The YTC wildlife biologist supplemented information on plant communities within the YTC Management Plan. Very little information is available on vegetation cover types on state and private lands within the project area.

Studies on regional plant communities within the Columbia Basin provide general descriptions of plant associations, but little site-specific information. Aerial photographs and USGS quadrangle maps covering the project area were also used for information on landforms, water features, and elevation. The field data on sensitive wildlife occurrences mapped on Washington Department of Fish and Wildlife (WDFW) Habitats and Species Maps had some information about plant communities in locations near the project area, although this information was very general in nature.

The USGS produces National Land Cover Data Maps that include some information on vegetation. These maps were used to calculate vegetation cover types along various project segments, presented in Table 3.4-1, *Land Uses and Vegetation Crossed by Each Line Segment*, describes the different land uses and vegetation types crossed by each segment. This data provides a measure of the amount of existing native vegetation along each segment. The two categories, "Shrub-Steppe" and "Forest", represent areas with plant communities that are likely to have some native species remaining although the condition of these areas could vary from fairly pristine to very degraded. Areas where agricultural activities occur are unlikely to recover and return to natural vegetation, even if abandoned. The small amount of forest cover within the study area indicates the importance of tree-lined riparian habitat.

Table 3.4-1
Land Uses and Vegetation Crossed by Each Line Segment

Land Use	Distance and Percentage of Each Segment						
	A	B NORTH	B SOUTH	C	D	E	F
Commercial, Industrial, and Transportation	0.17 mi 0.6%	0.02 mi 0.2%	0.02 mi 0.2%	0.02 mi 0.1%	0.31 mi 1.2%	0.04 mi 0.2%	0.06 mi 0.2%
Residential	0%	0%	0%	0.01 mi 0.1%	0.02 mi 0.1%	0%	0%
Water	0%	0.49 mi 5.4%	0.49 mi 5.2%	0.02 mi 0.1%	0.3 mi 1.1%	0.61 mi 2.4%	0.5 mi 1.5%
Unknown	0.44 mi 1.6%	0.11 mi 1.2%	0.42 mi 4.4%	0.43 mi 1.4%	1.02 mi 3.8%	2.19 mi 8.7%	4.22mi 12.9%
Forest	0.5 mi 1.8%	0%	0%	0.2 mi 0.7%	0.11 mi 0.4%	0.01 mi 0.1%	0.01 mi 0.1%
Shrub-Steppe	25.92 mi 94.1%	8.51 mi 93.2%	8.54 mi 90.2%	29.38 mi 97.7%	16.23 mi 60.7%	17.64 mi 69.8%	27.63 mi 84.3%
Agricultural	0.51 mi 1.9%	0%	0%	0%	8.75 mi 32.7%	4.77 mi 18.9%	0.34 mi 1.0%
Subtotal Vegetation	**26.93 mi 97.8%**	**8.51 mi 93.2%**	**8.54 mi 90.2%**	**29.58 mi 98.4%**	**25.09 mi 93.8%**	**22.42 mi 88.8%**	**27.64 mi 85.4%**
Total Distance	**27.54 mi**	**9.13 mi**	**9.47 mi**	**30.06 mi**	**26.74 mi**	**25.26 mi**	**32.76 mi**

New table for the FEIS.

The Washington Natural Heritage Program (WNHP) tracks occurrences of "***high quality plant communities***" (WNHP Website). Two WNHP high quality shrub-steppe plant communities occur within the study area (Map 5, *Wetlands/Plant Associations*). A Wyoming big sagebrush/bluebunch wheatgrass shrubland community occurs along a small portion of Segment A. Dominant species include big sagebrush, gray rabbitbrush, bluebunch wheatgrass, Sandberg's bluegrass, Cusick's bluegrass, and Lyall's milk-vetch. There is evidence of current cattle grazing in this community. The bitterbrush/Indian ricegrass shrubland community occurs in a broad band north of the Columbia River along segments D, E, and F. It includes the immediate floodplain along the river and has a sandy and cobbly substrate. Dominant species include bitterbrush, Indian ricegrass, stiff sagebrush, snow buckwheat, green rabbitbrush, and needle-and-thread grass. The common forbs are those typical of sandy areas. In one portion of this community, big sagebrush is associated with bitterbrush and Indian ricegrass (USDOE, 2001).

For Your Information

Lithosols *are rocky soils that usually develop in areas underlain by basalt.*

Foot surveys for rare plants and vegetation communities took place along the Preferred Alternative (Segments A, Option B_{SOUTH} and D). Shrub-steppe vegetation communities along these segments were broken into four categories: Washington Natural Heritage Program Areas, Moderate-High Quality Shrub-Steppe, Low Quality Shrub-Steppe and ***Lithosol*** Areas. Washington Natural Heritage Program Areas refer to the WNHP high quality plant communities described above. Moderate-High Quality Shrub-Steppe describes areas where shrub-steppe is relatively undisturbed and contains high percentages of native species, Low Quality Shrub-Steppe describes areas of shrub-steppe that have been heavily disturbed and/or have a high percentage of non-native species present, and Lithosol Areas describes a shrub-steppe plant community which grows on thin, stony soils known as ***lithosols***. Table 3.4-2, *Vegetation Types Crossed by Preferred Alternative*, lists the different types of vegetation crossed.

Table 3.4-2
Vegetation Types Crossed by Preferred Alternative

Vegetation Type Crossed by Alignment		A (miles)	B_{SOUTH} (miles)	D (miles)	Total (minus fiber) (miles)	V-C Fiber Optic Line (miles)
Shrub-Steppe	WNHP Program Areas	0.16	0.00	0.76	0.92	-
	Moderate-High Quality Shrub-Steppe	7.94	8.54	8.22	25.85	-
	Low Quality Shrub-Steppe	3.85	0.00	7.25	11.10	-
	Lithosol Areas	13.97	0.00	0.00	11.80	-
	Total Shrub-Steppe	25.92	8.54	16.23	50.69	20.41
Riparian		0.50	0.01	0.30	0.81	0.06
Agricultural		0.51	0.00	8.75	9.26	9.92
Other Unvegetated Areas		0.61	0.93	1.46	3.00	1.12
Total Segment Miles*		27.54	9.48	26.74	63.76	31.51

New table for the FEIS.

3.4.1.1 Segment A

The vegetation of Segment A is mainly shrub-steppe with a few riparian and agricultural lands. The majority of Segment A is composed of lithosol shrub-steppe communities which typically support stiff sagebrush, Sandberg's bluegrass, narrow leaf goldenweed, thyme-leaf buckwheat, Douglas' buckwheat, and Hood's phlox. Other common flowering plant species observed growing in lithosol communities in Segment A include bitterroot, desert-parsley species, and yarrow (St. Hilaire, 2001).

Deep soiled portions of Segment A support a big sagebrush/bluebunch wheatgrass shrub-steppe community that is the dominant potential plant community throughout the study area. Approximately two-thirds of these areas are moderate-high quality shrub-steppe, interspersed with areas of low quality shrub-steppe. Because of past disturbance such as grazing, native grasses have declined in the low quality shrub-steppe areas and the dominant grass species are now cheatgrass and Japanese brome. Diffuse knapweed, a weedy species, is common along roadsides Segment A, as it is throughout the study area. Parts of the western portion of Segment A are overgrazed.

One area of Segment A covered by the big sagebrush/bluebunch wheatgrass community has been designated a WNHP high quality plant community, as discussed in Section 3.4.1. It occurs along approximately 0.2 miles of Segment A. Other shrub species found in this community include occasional stiff sagebrush, bitterbrush, and gray rabbitbrush.

Approximately 5 miles of Segment A passes through the YTC. Vegetation of the YTC is discussed in Segments B and C below (Sections 3.4.1.2 and 3.4.1.3).

Segment A has several tree-lined riparian areas. Naneum and Wilson Creeks, in the northern portion of Segment A, are lined by scattered black cottonwoods, bittercherry, wavy-leaved alder, and quaking aspen. Common shrub understory species include willow species, Wood's rose, serviceberry, mockorange, common snowberry, and red osier dogwood. To the southeast, Cooke Creek and Coleman Creek have black cottonwood and quaking aspen lined riparian areas with scattered shrubs, including wavy-leaved alder, black hawthorn, willows in wetter areas and oceanspray in dry areas. Many intermittent creeks along Segment A support channel vegetation consisting of upland shrubs, including oceanspray, Wood's rose, mockorange, black hawthorn, serviceberry, and big sagebrush. Understory species include white sagebrush, mountain monardella, cheatgrass, yarrow, chicory and Rocky Mountain iris.

The Sickler-Schultz Reroute crosses a mixture of shrub-steppe and lithosol communities. It also traverses a steep northwest-facing slope with a small patch of open Ponderosa pine forest. Options 1 and 2, associated with the Sickler-Schultz Reroute, would cross different areas of Wilson Creek. Both of the Wilson Creek crossing options and the Naneum Creek crossing have vegetation typical of tree-lined riparian areas.

3.4.1.2 Segment B

The vegetation of Segment B (both Option B_{NORTH} and Option B_{SOUTH}) is almost entirely shrub-steppe with some small riparian areas. The shrub-steppe areas in Options B_{NORTH} and B_{SOUTH} are dominated by big sagebrush and bluebunch wheatgrass. Almost all of Segment B Options B_{NORTH} and B_{SOUTH} are in YTC. YTC categorizes their habitats as upland, riparian, alkali, or rocky habitats (USDOD, 1996). Three potential plant communities occur within the area traversed by Segment B. Although YTC plant communities are not pristine due to a history of grazing, the plant communities in both Option B_{NORTH} and B_{SOUTH} are generally in good condition. Shrub-steppe vegetation communities surveyed along Option B_{SOUTH} of the Preferred Alternative are composed entirely of moderate-high quality communities.

The three shrub-steppe communities within the YTC portion of Segment B include:

- **Big sagebrush/bluebunch wheatgrass**: This community is estimated to cover half of the uplands at YTC. It is found on ridgetops, hillsides, benches, and alluvial fans on shallow and deep soils. Associated species include gray and green rabbitbrush, desert buckwheat, three-tip sagebrush, and spiny hopsage associated with various grass species. Bitterbrush is co-dominant with big sagebrush in moist sites.

- **Stiff sagebrush/bluegrass**: This low-growing community occurs on hillsides, ridgetops, and benches in shallow soils. The shrub canopy is dominated by stiff sagebrush and eriogonum with traces of Wyoming big sagebrush, slenderbush eriogonum, purple sage, and bitterbrush, with a grass understory.

- **Eriogonum/ bluegrass**: This low-growing community is found on hillsides, ridgetops, and on shallow soils. The shrub canopy is dominated by eriogonum and either stiff sagebrush or three-tip sagebrush with a trace of Wyoming big sagebrush and purple sage. The herbaceous understory is mainly composed of grasses.

The area immediately to the west of the Columbia River is gravelly with very little vegetative cover. A few willows are scattered along the riparian area at the water's edge. The slope from the river leading up to the highway is vegetated with rabbitbrush, occasional sagebrush, and various grass species. Shrub-steppe tops the bare rocky cliff above the highway, extending to the west. On the east side of the Columbia River, a dry, level, sagebrush-dominated area extends along the river. Cheatgrass and knapweed are common in the understory with some native vegetation, including yarrow and buckwheat. Between the Columbia River and the Vantage Substation, the proposed line traverses a dry, hilly expanse of shrub-steppe.

3.4.1.3 Segment C

The vegetation of Segment C is mainly shrub-steppe with some grasslands and no agricultural land. YTC categorizes their habitats as upland, riparian, alkali, or rocky habitats (USDOD, 1996). Five potential plant communities occur within these habitat types in all of the watersheds traversed by Segment C. Plant communities on YTC are generally not pristine and cheatgrass commonly replaces bluebunch wheatgrass in some areas due to past grazing.

The five plant communities within the YTC portion of Segment C include:

- **Big sagebrush/bluebunch wheatgrass**: This community is estimated to cover half of the uplands at YTC. It is found on ridgetops, hillsides, benches, and alluvial fans on shallow and deep soils. Associated species include gray and green rabbitbrush, desert buckwheat, three-tip sagebrush, and spiny hopsage associated with various grass species. Bitterbrush is co-dominant with big sagebrush in moist sites.

- **Three-tip sagebrush/bluebunch wheatgrass**: This community is typically found on northern exposed hillslopes, canyon walls, and ridgetops, with moderately deep to deep soils. Associated species include big sagebrush, desert buckwheat, with traces of spiny hopsage, purple sage, and various grass species.

- **Stiff sagebrush/bluegrass**: This low-growing community occurs on hillsides, ridgetops, and benches in shallow soils. The shrub canopy is dominated by stiff sagebrush and buckwheat with traces of Wyoming big sagebrush, slenderbush eriogonum, purple sage, and bitterbrush, with a grass understory.

- **Eriogonum/ bluegrass**: This low-growing community is found on hillsides, ridgetops, and on shallow soils. The climax shrub canopy is dominated by buckwheat and either stiff sagebrush or three-tip sagebrush with a trace of Wyoming big sagebrush and purple sage. The herbaceous understory is mainly composed of grasses.

- **Alkali habitat**: This habitat type, found only in the Hanson Creek watershed, is normally found in bottomlands adjacent to intermittent streams and is occasionally associated with riparian communities bordering perennial streams. This community consists of black greasewood with traces of gray rabbitbrush.

Within the YTC, the level and type of disturbance to vegetation varies depending on the location. Most portions of the study area were grazed until 1995. Grazing reduced cover of perennial grasses and native forbs, and increased the cover of sagebrush. Grazing also damaged the vegetation in riparian areas although YTC has implemented riparian restoration projects along some creeks in the study area. Roads are present within most portions of the watershed, serving to disperse weed species. Training maneuvers occur in portions of the study area, damaging vegetation. Some of the vegetation in the study area is still recovering from several fires in the 1970's and 1980's. Native species were replaced with non-native species, and in some places habitat conditions were altered due to erosion.

Although the proposed Wautoma substation site was once a shrub-steppe community, the site is currently dominated by grass and herbaceous species with only occasional sagebrush and rabbitbrush (St. Hilaire, 2001). This area burned in the recent past, as evidenced by charred shrub stumps and abundant soot in the soil. Three non-native weedy species, tumblemustard, filaree and cheatgrass, are the dominant species on the site, but other common weeds include diffuse knapweed, spotted knapweed, bulbous bluegrass, and kochia. Native forbs scattered on the site include chaenactis, green-banded star-tulip, hoary aster, Grays' desert parsley, Munro's globemallow, cushion daisy, phlox, and Carey's balsamroot, all relatively common shrub-steppe species. The overall cover of native species in this area is very low.

3.4.1.4 Segment D

The vegetation of Segment D is shrub-steppe and agricultural lands with some riparian areas associated with Lower Crab Creek and the Columbia River. Approximately half of the shrub-steppe communities along Segment D are moderate-high quality shrub-steppe while the other half have been extensively disturbed and are low quality shrub-steppe.

Much of the section between the Vantage Substation and Lower Crab Creek has a very sandy substrate with a bitterbrush/Indian ricegrass shrubland community. A unique assemblage of plants occurs in these sandy habitats, with the dominant species including: bitterbrush, Indian ricegrass, gray rabbitbrush, green rabbitbrush, white buckwheat, spiny hopsage, and needle-and-thread grass. The riparian area along the north shore of Lower Crab Creek is described as willow-dominated wetland (WDFW, April 2, 2001). The emergent wetlands along both shores of Lower Crab Creek are vegetated with rushes, barnyard-grass, purple loosestrife, Canadian thistle, sprangletop, white sweet-clover, and bulrushes. Russian olive, a non-native tree species, occurs in the area. This creek crossing is quite weedy from a prolonged history of grazing.

To the south, the north-facing slope of the Saddle Mountains have a mosaic of shrub-steppe and lithosol in generally good condition. Dominant shrubs include big sagebrush, rigid sagebrush, gray rabbitbrush, slenderbush buckwheat, rock buckwheat, bitterbrush, purple sage, spiny hopsage, and threetip sagebrush. Dominant grass species include bluebunch wheatgrass, Sandberg's bluegrass, Cusick's bluegrass, Indian ricegrass and needle-and-thread grass. The south-facing slope of the Saddle Mountains are comprised of a similar mix of shrub-steppe and lithosol, however, the lower elevation areas are increasingly weedy with cheatgrass, tumble mustard and other non-native species. The Wahluke slope to the south is intensively irrigated and farmed.

The Hanford Site portions of Segment D (owned by Department of Energy) range from north of the Columbia River to the south base of Umtanum Ridge near Cold Creek. North of the Columbia River, a WNHP high quality native plant association occurs along approximately 0.8 mile of Segment D. This community is described in Section 3.4.1, *Vegetation Cover Types*. Wetland plant communities do not appear to occur along the Columbia River north of the Midway Substation, except possibly for a narrow herbaceous shoreline community. A sand dropseed/Sandberg's bluegrass community occupies the sandy and cobbly area immediately along the south side of the Columbia River. This area has become quite weedy due to overgrazing.

The Midway Substation is located at the base of Umtanum Ridge. The area within and immediately adjacent to the substation has been cleared of natural vegetation, with sparse shrub-steppe extending to the base of Umtanum Ridge. The north slopes of Umtanum Ridge support a bluebunch wheatgrass community. While most of the big sagebrush there was killed by an extensive wildfire in 1996, young plants are starting to establish. Rocky areas include the cliffs of Umtanum ridge and a narrow strip of talus at the base of the ridge. Rocky areas support a sparse community of plants that survive in the small pockets of soil that accumulate in cracks. From the crest of Umtanum Ridge to the south, several plant communities have been mapped, including big sagebrush-spiny hopsage/Sandberg's bluegrass-cheatgrass and bunchgrass-cheatgrass communities (USDOE, 2001). In alkaline areas, the shrub winterfat is abundant. Much of the shrub cover on Umtanum Ridge was burned by an extensive wildfire in 1996. There are a number of rare plant species in the Umtanum Ridge area (Section 3.4.3.5, *Known Rare Plant Occurrences by Segment*).

The vegetation along the section between the Hanford Site and the proposed Wautoma substation is comprised of shrub-steppe, grassland and agricultural land in the Cold Creek Valley. Vegetation on Yakima Ridge is primarily big sagebrush/bluebunch wheatgrass and Sandberg's bluegrass/cheatgrass. Other common species include spiny hopsage, Thurber's needlegrass, Indian ricegrass, and balsamroot. Vegetation communities at higher elevations and on the north slope of Yakima Ridge are typically of higher quality than those at lower elevations and on the south-facing slope. Segment D terminates at the proposed Wautoma substation. The vegetation at the proposed substation site is described in the Segment C discussion (See Section 3.4.1.3, *Segment C*).

3.4.1.5 Segment E

The vegetation of Segment E is mainly shrub-steppe with some grasslands and agricultural lands. The large emergent wetland south of Lower Crab Creek Road is vegetated with cattails and bulrush. To the south, scattered willows line the northern shore of Lower Crab Creek. The south shore of Lower Crab Creek consists of an emergent wetland vegetated with rushes, cattails, grasses, forbs, and scattered Russian olive trees (WDFW, April 2, 2001). To the south, the rocky, steep slopes on the north side of Saddle Mountains are described as having sparse shrub-steppe vegetation in areas with gentler slopes. The agricultural lands in the valley are mainly in cropland with small adjacent areas that may have some remnants of native plant communities.

The Saddle Mountain Unit of the Hanford Reach National Monument is characterized as relatively undisturbed or recovering shrub-steppe habitat, with some sand dune areas dominated by grasses, and water influenced areas mapped as riparian areas (USDOE, 2001, Sackschewsky and Downs, 2001). Hanford Site plant community maps depict three communities in the northeastern portion of the Saddle Mountain Unit, including big sagebrush /bunchgrasses-cheatgrass, big sagebrush-spiny hopsage/bunchgrasses-cheatgrass, and a small area of rabbitbrush/bunchgrass. To the south, a large area of bitterbrush/bunchgrass sand dune complex is mapped between two large wetland areas. These communities are considered "Plant Communities of Concern on the Hanford Site" (USDOE, 2001).

The bitterbrush/Indian ricegrass shrubland north of the Columbia River is a WNHP high quality plant community. This community extends along the river for several miles, including about 2.5 miles along Segment E. This sand dune community is described in Section 3.4.1, *Vegetation Cover Types*.

Wetland plant communities, dominated by herbaceous species and scattered shrubs, occur in the Saddle Mountain Wasteway, north of the Columbia River. Wetland plant communities do not occur along the shoreline of the Columbia River, except possibly for a narrow herbaceous wetland along the shoreline.

3.4.1.6 Segment F

The vegetation of Segment F is mainly shrub-steppe with some grasslands and very little agricultural land. Immediately north of Lower Crab Creek, a dune/willow complex occurs in the area of the proposed line (WDFW, April 2, 2001). This area may be somewhat degraded due to ATV use. The south shore of Lower Crab Creek consists of an emergent wetland vegetated with rushes, cat-tails, grasses, forbs, and scattered Russian olive. To the south, the rocky, steep slopes on the north side of Saddle Mountains are described as having sparse shrub-steppe vegetation in areas with gentler slopes.

Segment F traverses the Saddle Mountains from west to east, mainly along BLM land. BLM has not mapped plant communities in this area (P. Camp, Pers. Comm., 2001). This dry south-facing slope is mainly vegetated with grasses, with very few shrubs due to fires in the past. Scattered shrubs occur, mainly in the drainageways of intermittent creeks.

As described under Segment D, the area to the north of the Columbia River, in the Hanford Reach National Monument, is characterized as relatively undisturbed or recovering shrub-steppe habitat, with some sand dune areas dominated by grasses, and water-influenced areas, mapped as riparian areas (USDOE, 2001).

The bitterbrush/Indian ricegrass shrubland that occurs north of the Columbia River along Segment F is a WNHP high quality native plant community. This community extends along Segment F for approximately 0.3 mile. It is described in Section 3.4.1, *Vegetation Cover Types*.

3.4.1.7 Fiber Optic Line

The 32-mile fiber optic line from Vantage to Columbia traverses a mosaic of agricultural areas, shrub-steppe and wetlands. There are two areas along the line with extensive wetlands; in the vicinity of the Vantage Substation and the WDFW-managed Quincy Lakes Wildlife Area. The wetlands around the Vantage Substation have resulted from irrigation runoff and seepage from nearby agricultural areas. The Quincy Lakes were created by a series of dams and impoundments. In both locations, the wetlands are of low quality and are dominated primarily by weedy species mixed with common native wetland species. Dominant non-native species include: Russian olive, purple loosestrife, cheatgrass, Canadian thistle, reed canarygrass, bulbous bluegrass, white sweetclover, perennial pepperweed, white mulberry, and annual beardgrass. Common native species include: bulrush species, rush species, sedge species, saltgrass, common spike-rush, basin wildrye, and willow species.

The shrub-steppe communities along the proposed fiber optic line include a combination of big sagebrush /bluebunch wheatgrass shrubland, sandy shrub-steppe and lithosol communities. While there are some areas that are degraded, the shrub-steppe communities along the fiber optic line are generally in good condition. There are big sagebrush/bluebunch wheatgrass shrubland communities on the north slopes of Lynch Coulee and Moses Coulee, in the Frenchman Hills and in Frenchman Coulee. Shrub species include big sagebrush, spiny hopsage, buckwheat species, and purple sage. Common grass species include bluebunch wheatgrass, Sandberg's bluegrass, needle-and-thread grass, and cheatgrass. Forb species include balsamroot, chaenactis, desert-parsley species, and milk-vetch species.

Much of the section between the Vantage Substation and Sand Hollow has a very sandy substrate and a bitterbrush/Indian ricegrass shrubland community. A unique assemblage of plants occurs in these sandy shrub-steppe areas, with the dominant species including: gray rabbitbrush, green rabbitbrush, bitterbrush, Indian ricegrass, white buckwheat, spiny hopsage, and needle-and-thread grass. South of I-90, in between agricultural areas are extensive needle-and-thread grass dominated communities. Cover by native bunchgrasses exceeds 50% in many places. Lithosol communities along the fiber optic line occur on thin, stony soils and support stiff sagebrush, Sandberg's bluegrass, narrow leaf goldenweed, thyme-leaf buckwheat, and Hood's phlox. Common forb species observed growing in lithosol communities include bitterroot, desert-parsley species, daisy species and yarrow. There are limited amounts of black greasewood/saltgrass dominated communities in alkaline areas in the vicinity of the Quincy Lakes.

3.4.2 Weed Species

Some plant species are designated as weeds by federal or state law. Past land uses in the proposed study area, such as grazing, agriculture and road building, have disturbed native plant communities and favored the establishment of some weed species. Present land uses, such as the use of vehicles along dirt roads or off-road, grazing, and the expansion of agriculture, continue to contribute to the spread of weed species. However, some weeds do not require disturbances in order to thrive and are able to invade natural areas.

Weed species have numerous detrimental effects, and their invasion of public and private lands is a matter of great concern. Weed species reduce the quality of shrub-steppe by replacing native species and reducing ***biodiversity***. Some form ***monocultures***, which

For Your Information

*A **monoculture** is the growth of a single species, tending to exclude other species, resulting in a decrease in biodiversity.*

***Biodiversity** refers to different species of plants and animals in an environment.*

completely displace native plant communities. Weeds reduce the quality of wildlife habitat when they replace native food sources and plant cover species. They can also have adverse economic impact on agricultural crops. Some contribute to the rapid spread of fire by providing quick burning fuels. In addition, most weeds are not as efficient as native species at binding soil, which contributes to soil erosion by water and wind.

For Your Information

State and federal agencies were contacted for information on weed species of concern in the study area. Weed board personnel in Kittitas, Grant, Yakima, and Benton counties provided information on the species of particular concern in the study area.

Class A Weeds *are non-native species with a limited distribution in Washington. Preventing new infestations and eradicating existing infestations is the highest priority. Eradication is required by law.*

Class B Weeds *are noxious weeds that are not native to the state and are of limited distribution or are unrecorded in a region of the state and that pose a serious threat to that region.*

Class C Weeds *are widely established and have interest to the agricultural industry. Some of these weeds are controlled on a local basis, depending on local threats and the feasibility of control.*

In Washington, weed species are addressed on a county-by-county basis (Washington State Noxious Weed Control Board Website). Washington State law designates some particularly troublesome weeds as "noxious weed" species. The list of noxious weed species is divided into three classes (A, B, and C) within each county, based on the state of invasion. Table 3.4-3, *Weeds of Concern in Study Area*, lists the ***Class A*** and ***Class B*** weeds that are of concern within each project segment.

Class C includes species already widely established in Washington. Where present in the study area, these weeds may be controlled as a local option, depending on the level of threat. Spiny cocklebur, a Class C weed found in Kittitas County, is present in some areas (Segments A, B_{SOUTH}, B_{NORTH}, and C). Bull thistle and Canada thistle are found throughout the entire study area. Other Class C noxious weeds located in moist areas in the study area include: globepodded hoarycress, field bindweed, common St. John's-wort, and reed canarygrass.

Some weed species are monitored by the state when they are suspected to be a potential threat or if more information is needed on the species. Saltcedar (a Class A Noxious Weed) and common reed are monitored in the state of Washington. They are found in some wetlands on Hanford Site (Segments E and F), where efforts are being made to eliminate known occurrences (D. Gonzales, Pers. Comm., 2001). Many weeds widespread in the study area are not monitored or listed as noxious weeds.

Weed surveys have been completed along the Grant County portion of the Preferred Alternative. No noxious weeds were found. Additional surveys are being conducted for the remaining portions of the Preferred Alternative. These surveys would be completed before construction begins.

Table 3.4-3
Weeds of Concern in Study Area

Common Name *Scientific Name* (Washington State Class*)	**Kittitas County** Segments A, B, C	**Yakima County** Segment C	**Grant County** Segments D, E, F	**Benton County** Segments D, E, F
Dalmatian toadflax *Linaria dalmatica* ssp. *dalmatica* (Class B)	X	X	+	--
Johnsongrass *Sorghum halepense* (Class A)	-	X	--	--
Knapweed, diffuse *Centaurea diffusa* (Class B) except Benton County – no class	X YTC	X YTC	X HAN BLM	X HAN
Knapweed, spotted *Centaurea biebersteinii (maculosa)* (Class B)	X YTC	X YTC	X BLM	X
Knapweed, Russian *Acroptilon (Centaurea) repens* (Class B)	YTC	X YTC	X HAN	X HAN
Kochia *Kochia scoparia* (Class B)	YTC	YTC	+	X
Musk Thistle *Carduus nutans* (Class B)	X	X	X	--
Pepperweed, perennial *Lepidium latifolium* (Class B)	YTC	YTC	--	--
Puncturevine *Tribulus terrestris* (Class B) Grant County *Education list* Benton County	-	--	HAN	HAN
Purple loosestrife *Lythrum salicaria* (Class B)	X YTC	X YTC	+	HAN
Rush Skeletonweed *Chondrilla juncea* (Class B)	--	--	X BLM	X
Scotch thistle *Onopordum acanthoides* (Class B)	YTC	X YTC	--	--
Sowthistle, perennial *Sonchus arvensis* (Class B)	YTC	YTC	--	--
Wild carrot *Daucus carota* **(Class B)**	+			

X species name provided by County Weed Board staff
BLM species name provided by BLM personnel
YTC species name found within the YTC Management Plan
HAN species name provided by Hanford Reach National Monument personnel
\+ field observation
Table has been updated for the FEIS.

3.4.3 Rare Plants

For a complete discussion of the rare plant survey, methodology, and a description of the rare plant species found along the Preferred

Alternative, see Appendix F, *Rare Plant Survey for the Preferred Alternative*.

The list of potential rare plant species varies depending on land ownership. Table 3.4-4, *Rare Species Addressed in Different Land Ownership Categories*, identifies land ownership categories and the status of species that will be considered within each of these categories.

For Your Information

The study area for rare plants includes an area 1 mile on either side of each of the segment centerline, for a total of a 2-mile-wide strip. To address known occurrences of rare plant species that may be directly impacted by project activities, occurrences in the "immediate area" of the proposed line are those within 500 feet on either side of the line or within 100 feet of each side of access roads outside the ROW.

***Extirpated** is a species that is no longer known to occur in a given geographic area.*

Table 3.4-4
Rare Species Addressed in
Different Land Ownership Categories

Land Ownership/Management Category	Status of Plant Species
BLM	BLM special status species which includes federally listed, proposed, and candidate species and state rare species
All federally managed lands except BLM lands	Federally listed, proposed, and candidate species, federal species of concern, state listed species.
State owned Lands	Federally listed, proposed, candidate species, and species of concern; state endangered, threatened, and sensitive species, and a state category that includes species that are possibly extinct or **extirpated** in Washington
Private Lands	Federally listed, proposed, and candidate species

Table has been updated for the FEIS.

Information on known occurrences, habitat preferences, and potential habitats of federal listed and federal candidate plant species are discussed below. Information was also assembled for federal species of concern, BLM special status species, and state listed rare plant species. This includes known occurrences of these species within the study area. Information sources included: USFWS, WNHP sources, and regional floras.

3.4.3.1 Federal Listed Plants

The USFWS identified two federally listed species and three federal candidate species with the potential to occur within the study area (USFWS, 2001). Table 3.4-5, *Federal Status Plant Species with the Potential to Occur in the Study Area*, lists the habitat and known occurrences of federal status species within the vicinity of the study area. These plants are also listed by the State of Washington (WNHP, 1997) (See Table 3.4-8, *Known Occurrences of Rare Plant Species*). A detailed description of these species is in Appendix F, *Rare Plant Survey for the Preferred Alternative*.

Table 3.4-5
Federal Status Plant Species with the Potential to Occur in the Study Area

Common Name *Scientific Name*	Federal Status	Habitat Preference and Plant Associations	Known Occurrence(s) in the Vicinity of the Study area
Wenatchee Mountains checker-mallow *Sidalcea oregana* var. *calva*	Endangered	Grows in meadows that are moist into the summer – associated with quaking aspen, black hawthorn, snowberry, and serviceberry.	Approximately 25 miles north of the north end of Segment A.
Ute ladies'-tresses *Spiranthes diluvialis*	Threatened	Low elevation wetlands in valleys - associated with spikerush, sedges, grasses, and rushes	None
Northern wormwood *Artemisia campestris* var. *wormskioldii*	Candidate	Grows only within the floodplain of the Columbia River in relatively level, arid, shrub-steppe, on basalt, compacted cobble, and sand - associated with sagebrush and grasses	None within 1 mile of line segments. One occurrence within the floodplain of the Columbia River, several miles south of the Segment B river crossing.
Basalt daisy *Erigeron basalticus*	Candidate	Grows in crevices in basalt cliffs on canyon walls facing north, east, or west, from 1,250 to 1,500 feet in elevation - associated with a few grass and forb species	None within 1 mile of line segments. Occurs within Kittitas and Yakima counties along the Yakima River and Selah Creek; within the YTC, approximately 10 miles west of Segment C.
Umtanum desert buckwheat *Eriogonum codium*	Candidate	Found on the exposed tops of a ridgeline that is composed of basalt, from 1,100 to 1,320 feet in elevation - associated with cheatgrass and a variety of forbs.	One known population, on part of Umtanum Ridge, in Benton County.

Table has been updated for the FEIS.

Potential habitat for federally listed and candidate species occurs within the study area. Potential habitat includes any areas that meet the known habitat requirements for that species. Table 3.4-6, *Potential Habitat for Federal Listed and Candidate Plant Species*, lists the project segments that may contain potential habitat for federally listed and candidate species and state listed species.

Rare plant field surveys were conducted in 2001 and 2002 along the Preferred Alternative (Segments A, B_{SOUTH} and D) to locate federally listed and candidate species. No federally listed or candidate species were identified within the Preferred Alternative ROW, however a population of Umtanum desert buckwheat was identified along Segment D, next to an access road outside the ROW.

Table 3.4-6
Potential Habitat for Federal Listed and Candidate Plant Species

Common Name *Scientific Name*	Segments With Potential Habitat for Federal Listed and Candidate Rare Plant Species						
	A	B	C	D	E	F	Fiber Optic Line
Wenatchee Mountains checker-mallow *Sidalcea oregana* var. *calva*	■						
Ute ladies'-tresses *Spiranthes diluvialis*	■			■	■	■	■
Northern wormwood *Artemisia campestris var. wormskioldii*		■		■	■	■	
Basalt daisy *Erigeron basalticus*			■	■			
Umtanum desert buckwheat *Eriogonum codium*				■			

Table has been updated for the FEIS.

3.4.3.2 Federal Species of Concern

Seven federal species of concern were identified by the USFWS as having potential to occur within the study area (See Table 3.4-7, *Known Occurrences of Rare Plant Species*). A federal species of concern is one whose conservation standing is of concern to the USFWS, but for which status information is still needed (WNHP, 1997). These species are also listed by the State of Washington. Rare plant field surveys were conducted in 2001 and 2002 along the Preferred Alternative (Segments A, B_{SOUTH}, and D) to locate federal species of concern. No federal species of concern were located along Segments A and B_{SOUTH}. Populations of Hoover's desert-parsley, gray cryptantha, and Columbia milk-vetch were located along Segment D.

Table 3.4-7
Known Occurrences of Rare Plant Species

Common Name *Scientific Name*	Federal Status	State Status	Known Occurrences of Rare Plant Species Along Segments							
			A	B_{NORTH}	B_{SOUTH}	C	D	E	F	Fiber Optic Line
Umtanum desert buckwheat *Eriogonum codium*	Candidate	Endangered					■ *			
Columbia milk-vetch *Astragalus columbianus*	Species of Concern	Threatened		■*	■	■*	X			
Gray cryptantha *Cryptantha leucophaea*	Species of Concern	Sensitive		■	■*		X	■*		X
Hoover's desert-parsley *Lomatium tuberosum*	Species of Concern	Threatened					X	■*	■*	
Wanapum crazyweed *Oxytropis campestris* var. *Wanapum*	Species of Concern	Threatened							■	
Persistentsepal yellowcress *Rorippa columbiae*	Species of Concern	Threatened					■ *			
Hoover's tauschia *Tauschia hooveri*	Species of Concern	Threatened	■*							

Common Name *Scientific Name*	Federal Status	State Status	Known Occurrences of Rare Plant Species Along Segments							
			A	B NORTH	B SOUTH	C	D	E	F	Fiber Optic Line
Texosporium sancti-jacobi	Species of Concern								■	
Dwarf evening-primrose *Camissonia pygmaea*	--	Threatened		■	■		■		■*	
White eatonella *Eatonella nivea*	--	Threatened		■	■		■			
Geyer's milk-vetch *Astragalus geyeri*	--	Sensitive								X
Pauper milk-vetch *Astragalus misellus var. pauper*	--	Sensitive	■							
Naked-stemmed evening-primrose *Camissonia scapoidea*	--	Sensitive		■	■					
Bristle-flowered collomia *Collomia macrocalyx*	--	Sensitive		■	■					
Beaked cryptantha *Cryptantha rostellata*	--	Sensitive	■	■	■					
Desert cryptantha+ *Cryptantha scoparia*	--	Sensitive			X					
Snake River cryptantha *Cryptantha spiculifera*	--	Sensitive					■			
Shining flatsedge *Cyperus bipartitus*	--	Sensitive					■			
Beaked spike-rush *Eleocharis rostellata*	--	Sensitive								X
Piper's daisy *Erigeron piperianus*	--	Sensitive					X		■	
Longsepal globemallow *Iliamna longisepala*	--	Sensitive	■*							
Suksdorf's monkey-flower *Mimulus suksdorfii*	--	Sensitive	■*	■	■			■*		
Nuttall's sandwort *Minuartia nutallii var. fragilis*	--	Sensitive					■*			
Tufted evening-primrose *Oenothera cespitosa ssp. cespitosa*	--	Sensitive		■*	X	■	■*			

■ Occurrence within the general area of the segment.
■* Occurrence in the immediate vicinity (within approximately 500 feet) of segment.
X Rare plant documented within the ROW or access road – only segments A, B$_{SOUTH}$ and D were surveyed for rare plants.
\+ Species to be added when the WNHP next revises its list.
Table has been updated for the FEIS.

3.4.3.3 BLM Special Status Species

The Wenatchee Resource Area of the Spokane BLM District provided a special status species list for BLM lands within each of the four counties within the study area (See Appendix F, *Rare Plant Survey for the Preferred Alternative*). Rare plant surveys for species listed by the BLM were conducted on all BLM lands along the Preferred Alternative (Segments A, B$_{SOUTH}$, and D) in 2001 and 2002. Small populations of the BLM special status species Hoover's desert-parsley and gray cryptantha were located on BLM lands in the Saddle Mountains along Segment D.

The list of BLM special status species with the potential to occur along Segment F is included in Table 3.4-8, *BLM Special Status Plant Species*. The other line segments cross only a few land sections or smaller portions of sections of BLM land than Segment F. A specific list of special status species that might occur along line segments other than Segment F is not available from the BLM (Camp, Pers. Comm., 2001).

Table 3.4-8
BLM Special Status Plant Species

Species Common Name *Scientific Name*	Habitat Requirements
Geyer's milk-vetch *Astragalus geyeri*	Occurs in depressions in mobile or stabilized dunes, sandy flats, and valley floors within gray rabbitbrush/Indian ricegrass communities.
Bristle-flowered collomia *Collomia macrocalyx*	Dry, open habitats, on talus, rock outcrops, and lithosols, in sparsely vegetated areas with a low species diversity; within sagebrush dominated communities.
Gray cryptantha *Cryptantha leucophaea*	Occurs in sandy areas, on slopes associated with big sagebrush, and grasses, including Indian ricegrass, needle-and-thread grass, Sandberg's bluegrass, cheatgrass, and various forb species.
Common blue-cup *Githopsis specularioides*	Open places at lower elevation, on thin soils over bedrock outcrops, talus slopes and gravelly areas.
Hoover's desert-parsley *Lomatium tuberosum*	Occurs in loose talus, typically on east and north-facing slopes, within big sagebrush/bluebunch wheatgrass communities; also found in talus in drainage channels on south-facing slopes.
Nuttall's sandwort *Minuartia nuttallii* var. *fragilis*	Sagebrush dominated hills to high elevation slopes, found mainly on gravelly benches or talus slopes.
Cespitose evening-primrose *Oenothera cespitosa ssp. cespitosa*	Occurs in open sites on talus or on rocky slopes and may colonize road cuts; associated with big sagebrush, occurs in sagebrush dominated communities associated with gray rabbitbrush, Sandberg's bluegrass, needle and thread grass, Indian ricegrass, Junegrass, and forbs.
Wanapum crazyweed *Oxytropis campestris* var. *wanapum*	Occurs on the summit of the Saddle Mountains, descending down the north slope; in deep sand in the big sagebrush/blue bunch wheatgrass community.
Texosporum santi-jacobi	A pin-head lichen that occurs on soils as part of biological crust.

Table has been updated for the FEIS.

3.4.3.4 Washington State Rare Plant Species

All state lands along the Preferred Alternative were surveyed for state listed rare plant species, including Endangered, Threatened and Sensitive (WNHP, 1997). WNHP-maintained lists of rare plant species for each of the four counties along the Preferred Alternative were used as potential species lists (WNHP website, 2001) (see also Appendix F, *Rare Plant Survey for the Preferred Alternative*). A portion of a population of Columbia milk-vetch was located on DNR lands along Segment D. State listed rare plant species were also surveyed on federal lands. Populations of desert cryptantha, Piper's daisy, and tufted evening-primrose were located on federal lands along Segments B_{SOUTH} and D.

3.5 Wildlife

Approximately 150 wildlife species (birds, mammals, reptiles, and amphibians) are known to occupy shrub-steppe habitat for significant parts of their life cycles (Johnson and O'Neil, 2001). Many more species use shrub-steppe for smaller parts of their life cycle, such as birds migrating across central Washington stopping to forage. For example, a study of the Hanford Site documented 195 bird species in the general area where the project is proposed (Nature Conservancy, 1999). Many of these species are associated with open water habitats along the Columbia River. Of the wildlife species known to occupy shrub-steppe habitats, approximately 50 are closely associated with shrub-steppe habitat, and the remaining species use shrub-steppe habitat occasionally or incidentally. Shrub-steppe is one of the most heavily fragmented habitat types in Washington, and has been designated a Priority Habitat by the State of Washington.

For a complete discussion of the species and habitats present within the project area See Appendix G, *Fish and Wildlife Technical Report*.

3.5.1 Segment A

Wildlife populations along Segment A are generally typical of shrub-steppe habitats. The area is used as wintering grounds by large herds of mule deer (WDFW, 2001). The riparian areas of Wilson and Naneum Creeks provide winter roosting and foraging habitat for bald eagles. At least 30 bald eagles roost in Naneum Canyon upstream from the proposed crossings (Corkran, 2002). A sagebrush vole was sighted near Schnebly Canyon (WDFW, 2001). Colockum Creek Canyon is a migration corridor for the Quilomene elk herd. East of Cooke Canyon, a sharp tailed grouse sighting within 1 mile of the proposed line was recorded in 1981 (WDFW, 2001). The area east of Cooke Canyon is also known to harbor nesting long-billed curlews.

The riparian zone of Wilson-Naneum Creek, where Segment A crosses, is in good condition with mature cottonwoods and a diverse assemblage of riparian shrubs. The high quality of this particular section of Wilson and Naneum Creeks can be attested to by the fact that the area supports a large number of wintering bald eagles. The bald eagles rely on the large cottonwood trees for roosting and may use the open water areas of the stream to catch fish. Options 1 and 2, associated with the Sickler-Schultz Reroute, would cross different areas of Wilson Creek. Both areas have similar vegetation and wildlife.

Sage grouse have been infrequently observed in the area surrounding the southern section of Segment A (YTC, 2002). A sage grouse ***lek*** was observed in 1983 less than 1 mile southwest of the southern end

➡ For Your Information

*Sage grouse gather in the spring at specific locations, called **leks**.*

of Segment A although it has not been active recently. White-tailed jackrabbits have also been observed near the southern end of Segment A.

The potential reroute of a portion of Segment A would change the location of the proposed alignment slightly to the south, but would not cross any significantly different wildlife habitat than the original location. Species present along the proposed reroute are expected to be similar to those discussed for the original Segment A alignment.

3.5.2 Segment B

The affected environments for Segment B Options B_{NORTH} and B_{SOUTH} are effectively the same and are referred to as Segment B. Segment B crosses three distinct areas:

- The majority of the proposed line crosses through the shrub-steppe of the YTC;
- At the eastern end, the proposed line crosses the steep cliffs and narrow riparian area of the Columbia River;
- The Vantage Substation lies on a plateau at the top of the east bank of the Columbia River.

The YTC has indicated that sage grouse are infrequently observed in the area surrounding Segment B (YTC, 2002). Suitable sage grouse habitat exists in this area (YTC, 2002). Loggerhead shrike, sage thrashers, sage sparrows, and Swainson's hawks are also known to occur in the general vicinity of the proposed ROW (Stepniewski, 1998, U.S. Army, 1996, WDFW, 2001). Several small areas of suitable pygmy rabbit habitat were identified but appeared unoccupied.

For Your Information

*The **Pacific Flyway** is the path of migration for many different species of birds.*

***Neotropical** is the biogeographic region that extends south, east, and west from the central plateau of Mexico.*

Numerous species more often associated with wetlands and riparian habitats are found along Segment B, including ring-billed and California gulls, Caspian and Forster's terns, and Canada geese. This section of the Columbia River is located within the **Pacific Flyway**, and during the spring and fall months the area serves as a resting point for **neotropical** migrants, migratory waterfowl, and shorebirds. During the fall and winter months, large numbers of migratory ducks (>100,000) and geese (>10,000) find refuge in the Wanapum reservoir (WDFW, 2001). Other species present during winter months include American white pelicans, double-crested cormorants, and common loons. Bald eagles winter along the Columbia River. An historical sighting of a desert nightsnake within 1 mile of the proposed project was made on the west shore of the Columbia River (WDFW, 2001).

The area surrounding the Vantage Substation contains a unique complex of basalt cliffs, sand dunes, shrub-steppe, and small wetlands. Riparian vegetation exists within the wetland areas. Species of special note have been recorded as using the area surrounding the Vantage Substation, including the striped whipsnake and the desert nightsnake (WDFW, 2001). Bird species often found along the Columbia River (see the Columbia River discussion above) also utilize the wetland areas.

3.5.3 Segment C

Seven distinct areas characterize the habitat of this segment:

- Northern YTC area;
- Saddle Mountains;
- Central YTC area (including four drainage complexes);
- Umtanum Ridge;
- Cold Creek;
- Yakima Ridge; and
- Dry Creek.

The upland areas near Hanson Creek support over 75 percent of the breeding populations of loggerhead shrike on the YTC, and also support Swainson's hawks (U.S. Army, 1996). The Hanson Creek riparian area on both sides of the proposed ROW has documented bald eagle winter roost sites (WDFW, 2001, U.S. Army, 1996). Lewis's woodpeckers are also known to exist in the Hanson Creek Riparian area (U.S. Army, 1996). The Alkali Canyon Complex supports a large sage grouse lek and known populations of nesting prairie falcons (U.S. Army, 1996). Cliffs in Corral Canyon downstream of the proposed route also have documented prairie falcon nests (U.S. Army, 1996, WDFW, 2001). Breeding burrowing owls were sighted approximately 1.5 miles southwest of the proposed route between Corral Canyon and Sourdough Canyon in 1993 and 1994, but the nest was unoccupied in 1995-1997 (WDFW, 2001). Sage sparrows have also been observed in the Corral Canyon area (U.S. Army, 1996). Long billed curlews have been observed in the Corral Canyon Complex near the proposed route (Stepniewski, 1998).

Breeding sage grouse have been observed on the flatter areas of the south side of Umtanum Ridge. One lek is located less than 1 mile west of the proposed route (WDFW, 2001) with other leks located around further west. The WDFW indicates that this is considered the core area of one of the two remaining sage grouse populations in Washington (Clausing, 2001 and Schroeder, et al., 2000). Merriam's shrews were caught in research traps at the top of Umtanum Ridge near the proposed route (Wunder, et al., 1994).

The Cold Creek canyon contains an important mixture of native shrub-steppe vegetation and riparian areas between the Hanford Reach National Monument area and the YTC, which acts as a corridor for wildlife moving to and from these locations. Observations indicate the Cold Creek canyon is important to migrating birds (Stepniewski, 1998, Visser, 2001). Elk, deer, loggerhead shrike, and jackrabbits all use the Cold Creek canyon as a local migration corridor between the Hanford Reach National Monument and the YTC. Neotropical migrants, waterfowl, raptors, and many other bird species may use the canyon as a migration corridor, as part of their longer journeys between regions north and south of Central Washington (Stepniewski, 1998). Many of these migrants may stop and temporarily use the riparian or upland habitats. Breeding Swainson's hawks and loggerhead shrikes have been documented within 1 mile of the proposed route (WDFW, 2001, U.S. Army, 1996).

The entire eastern end of Yakima Ridge is considered a part of the Cold Creek migration corridor. On the south side of the ridge, a breeding prairie falcon was observed in 1988 within 1 mile of the proposed route (WDFW, 2001). Multiple sightings of breeding burrowing owls have been made in an area adjacent to where the proposed route crosses Highway 24 (WDFW, 2001).

Segment C terminates at the new Wautoma Substation just south of Yakima Ridge. The only documented species of note is a breeding colony of burrowing owls located approximately 0.5 mile southwest of the proposed substation (Corkran, 2001). Prime wintering habitat for the Hanford elk herd is located several miles east of the site along Dry Creek. It is likely that the Hanford elk herd, unique among elk herds because it exists exclusively in shrub-steppe habitat, travels as far upstream as the proposed substation.

3.5.4 Segment D

This segment crosses ten distinct areas:

- Vantage Substation area;
- Beverly area;
- Lower Crab Creek;
- Saddle Mountains;
- The Wahluke Slope;
- The Columbia River;
- Umtanum Ridge;

- Cold Creek drainage;
- Yakima Ridge; and
- Dry Creek.

The proposed route would enter the new Wautoma Substation area from the north. This area was discussed in the previous section (Section 3.5.3, *Segment C*).

Nightsnakes and striped whipsnakes have been documented adjacent to Segment D near the Vantage Substation. Bird species associated with the Columbia River may be incidental visitors to this area. Potential habitat for Washington ground squirrels was identified south of the Vantage substation, although surveys for the species did not find any populations (Corkran, 2002).

The Lower Crab Creek area is one of the most important waterfowl breeding grounds in Washington (Clausing, 2001). Many bird species also use the open water and wetlands for resting and feeding during their annual migrations along the Pacific Flyway. Beaver are found in some open water areas. Potential habitat for Washington ground squirrel exists at the base of the north slope of the Saddle Mountains. Surveys of this area did not find populations of ground squirrels, but did find populations of kangaroo rats (Hill, 2002).

For Your Information

Talus Slopes *are slopes with numerous loosely aggregated rocks.*

The Saddle Mountain area provides a variety of wildlife habitats including cliffs, **talus slopes**, benches, open grassy slopes, and shrub-steppe habitats. The steep north side has many steep rocky outcroppings, mostly located on the top third of the slope. Habitat for bats and raptors is abundant here. The crest of the Saddle Mountains has a unique dwarf shrub-steppe vegetation community with a number of rare plant species (Fisher, 2001). The south side contains some high-quality shrub-steppe vegetation that is relatively undisturbed. A historic sage grouse movement corridor and suitable habitat exists along the south slope of the Saddle Mountains, although no sage grouse have been observed recently in the area (Schurger, 2001, Visser, 2001, Corkran, 2002).

Large populations of Brewer's vesper, sage sparrows, sage thrasher, and other passerine bird species can be found in the spring and summer on the south side of the Saddle Mountains. The cliffs on the north and west side are home to many raptor species, including red-tailed, Swainson's, ferruginous and rough-legged hawks; prairie falcons; American kestrels; bald and golden eagles, and ravens. A golden eagle nest site is located less than 1 mile west of the proposed line in the Sentinel Bluffs, which lie above and just east of the Columbia River (WDFW, 2001). A prairie falcon nest site is located on the north slope of the Saddle Mountains just below the crest within 0.25 mile of the proposed line (WDFW, 2001). A striped whipsnake was sighted at the crest of the Saddle Mountains near the proposed line in 1979 (WDFW, 2001). A burrowing owl nest was observed next to the existing access road at the southern base of the Saddle Mountains (Corkran, 2002).

In the Wahluke Slope, mammal species present are limited to those that can tolerate high levels of disturbance, such as coyotes, raccoons, and a variety of rodent species. Structures such as barns and sheds provide roosting habitat for a number of bat species. Bird species present on the Wahluke Slope are also limited to those species that can tolerate high levels of human disturbance. Pheasant and quail utilize croplands. Red-winged and yellow-headed blackbirds may use the limited wetland areas associated with irrigation practices. Near the southern end of the area, a breeding loggerhead shrike was observed within 1 mile of the proposed route in 1993 (WDFW, 2001).

Like the Columbia River crossing described in Segment B, this section supports large numbers of wintering waterfowl and is located within the Pacific Flyway. During the spring and fall months it serves as a resting point for neotropical migrants, migratory waterfowl, and shorebirds. Bald eagles are present throughout the Hanford Reach during the winter, and feed on waterfowl and salmon carcasses. Several Swainson's hawk nests have been documented on the China Bar south of the Columbia River approximately 1 mile east of the proposed route (WDFW, 2001).

The cliffs of the north side of Umtanum Ridge harbor a large number of raptor species. Segment D passes close to a known prairie falcon nest. Other known prairie falcon nests are located within 1 to 2 miles on both sides of the proposed route. A loggerhead shrike was sighted at the crest of Umtanum Ridge in 1994. On the south slope of Umtanum Ridge, a Swainson's hawk nest was observed in 1990 within the proposed route. Three other Swainson's hawk nests are located within 1 mile of the proposed route (WDFW, 2001).

The broad valley of Cold Creek in this area contains a mixture of grassy shrub-steppe and agriculture. Cold Creek itself does not contain much riparian habitat in this area, but does have areas of relatively undisturbed shrub-steppe vegetation. As discussed in Segment C, Cold Creek acts as an important migration corridor of relatively undisturbed shrub-steppe habitat between the YTC and the Hanford Site along Cold Creek. The Cold Creek Valley is also a major bird migration corridor.

The Cold Creek migration corridor is used by elk, mule deer, sage grouse, jackrabbits, songbirds, and other animals traveling between the YTC and the Hanford Site (WDFW, 2001, Clausing, 2001, Stepniewski, 1998). Neotropical migrants, waterfowl, raptors, and many other bird species use the canyon as a migration corridor as part of their longer journeys between regions north and south of Central Washington (Stepniewski, 1998). Many of these migrants may stop and temporarily use the upland habitats. Nesting burrowing owls have been observed next to the proposed route near Highway 24 (WDFW, 2001). Prairie falcons, golden eagles, Swainson's hawks and Lewis' woodpeckers have all been observed using the Cold Creek valley for nesting or foraging near the proposed route crossing (Stepniewski, 1998).

The proposed route would enter the new Wautoma Substation area near Dry Creek from the north. This area was discussed in the previous section (Section 3.5.3, *Segment C*).

3.5.5 Segment E

This segment crosses ten distinct areas:

- Vantage Substation area;
- Beverly area;
- Lower Crab Creek;
- Saddle Mountains;
- The Wahluke Slope;
- Hanford Reach National Monument/Columbia River;
- Umtanum Ridge;
- Cold Creek drainage;
- Yakima Ridge; and
- Dry Creek.

Segment E crosses the Vantage Substation, the Beverly area, Lower Crab Creek and the Saddle Mountains parallel to Segment D. It then crosses the Wahluke Slope through areas similar to those crossed by Segment D. The wildlife species and habitats in these areas have been discussed in the previous section (Section 3.5.4, *Segment D*).

In the northern part of the Hanford Reach National Monument where Segment E crosses Highway 24, burrowing owls have been observed (WDFW, 2001). Near Saddle Mountain Lake, many observations of Woodhouse's Toads have been made. A herd of approximately 70 mule deer exists in the area east and south of Saddle Mountain Lake (WDFW, 2001, Haas, 2001, Corkran, 2001). Closer to the Columbia River near the Saddle Mountain Wasteway, nesting Swainson's hawks and great blue herons have been observed. Sagebrush lizards and nightsnakes have been documented near the proposed ROW (Nature Conservancy, 2001). Suitable habitat for sagebrush voles and pygmy rabbits is also known to exist in the Hanford Reach National Monument area near the proposed Segment E (Brunkal, 2001). Although the most recent surveys for pygmy rabbits did not find any populations, they were not exhaustive and historical records indicate that pygmy rabbits were present in the Hanford area in the past.

As with the rest of the Columbia River in central Washington, hundreds of thousands of waterfowl use the open water habitats and wetlands near proposed Segment E as breeding areas, over wintering areas, or stopovers on spring and fall migrations. These species, as well as neotropical migrants, may be present in or near the river. Communal bald eagle roosts are located within 3 miles of each side of the proposed crossing.

3.5.6 Segment F

The segment crosses the following distinct areas:

- Vantage area;
- Lower Crab Creek;
- Saddle Mountains
- The Wahluke Slope;
- Hanford Reach National Monument; and
- The Columbia River.

Near the Vantage area, an observation of an Ord's kangaroo rat caught in a trap was made in 1987 within the proposed ROW (see the Lower Crab Creek discussion below for more information on Ord's kangaroo rat). A ferruginous hawk nest was observed in 1995, approximately 1 mile east of Segment F (WDFW, 2001).

Segment F crosses Lower Crab Creek approximately 1 mile east of where proposed Segments D and E would cross. More extensive wetlands, including Nunnally Lake, are present in this area than exist near Segments D and E. As discussed in the Segment D section, Lower Crab Creek and its associated wetlands and riparian areas are among the most important waterfowl breeding grounds in Washington. Nunnally Lake is an important habitat for waterfowl. An area of sand dunes and willows exists just north of Lower Crab Creek.

Nunnally Lake supports a large population (3,000 to 4,000) of wintering ducks. Quail have been observed using the varied habitats along the valley bottom. Also, within 0.5 mile of the proposed line, a number of Ord's kangaroo rats were caught in 1996 and 1997 (Gitzen, et al., 2001). This sighting and the observation, made in 1987, 2 miles north of Lower Crab Creek (see the preceding Vantage Area discussion) are significant because they represent new sightings in areas where this species was not previously recorded.

The habitats and species of the western end of the Saddle Mountains where Segment F crosses were described in discussions of Segments D and E. Where Segment F turns east and follows the lower slope of the Saddle Mountains, different habitat conditions are encountered. On the south slope, the vegetation community changes from a sagebrush-dominated community on the west end to a grass-dominated community on the east end. A number of canyons intersect the south slope, providing some rocky outcrop and talus slope habitats. No observations of unique wildlife species have been made in this area, however this may be due to the extremely limited access in the area. WDFW reports that sage grouse were historically present along the Saddle Mountains, and that the relatively intact shrub-steppe vegetation is still considered a migration corridor between the YTC and areas east of the Saddle Mountains (Clausing, 2001, Fisher, 2001). In addition, species such as prairie falcons, ferruginous hawks and loggerhead shrikes have been observed on the crest and the north slope of the Saddle Mountains, within several miles of the proposed line. The area surrounding the proposed ROW near the eastern most end of Segment F supports one of the largest contiguous areas of occupied habitat for sage sparrows in Washington (Nature Conservancy, 1999).

South of Highway 24, Segment F drops over a steep slope approximately 200 feet into a large depression that contains Saddle Mountain Lake to the west. At the south end of the depression, the line intersects with Segment E, and crosses the Columbia River. Near the top of this slope, a Swainson's hawk nest was observed near Segment F (WDFW, 2001). A herd of approximately 40 mule deer was observed in the central part of the depression (Corkran, 2001). Near the southern end of the proposed segment, immature sage sparrows were observed within 1 mile of the proposed line in 1987 (WDFW, 2001). Sagebrush lizards and nightsnakes have been documented near the proposed route (Nature Conservancy, 2001).

The Segment F route crossing of the Columbia River follows the same alignment as Segment E. Wildlife habitats and species are the same as discussed in Segment E.

3.5.7 Fiber Optic Line

The 32-mile-long fiber optic line would cross a mosaic of agricultural areas, shrub-steppe and wetlands. While much of the land crossed by the fiber optic line (approximately 65%, or 21 miles) is agricultural, the remaining shrub-steppe and wetland areas provide habitat for a number of wildlife species. The wetlands and open water lakes of the Quincy Lakes Wildlife Refuge support wintering and breeding waterfowl. Several coulees with rocky cliffs and draws intersect the fiber optic alignment, providing habitat for prairie falcons, golden eagles, and various bat species. Higher areas with loess soils support burrowing owls. Several high quality shrub-steppe areas are present along the alignment, which could provide habitat for sagebrush species such as sage sparrow and sage thrashers. Long-billed curlews are known to use the area around Frenchman Hills for nesting and foraging.

3.5.8 Threatened and Endangered Species

Six federally listed threatened or endangered wildlife species and one proposed listed species were identified by USFWS as possibly occurring in the study area (See Table 3.5-1, *Possible Presence of State and Federal Listed Species Within Project Area*). Listed species include the grizzly bear, the gray wolf, the Canada lynx, the bald eagle, the northern spotted owl, and the marbled murrelet. The pygmy rabbit is proposed for listing as Endangered.

The grizzly bear, gray wolf, Canada lynx, northern spotted owl, and marbled murrelet are not known to currently exist in the project area, so the proposed project will have no impacts on these species.

Bald eagles are known to exist near water throughout the project area. The Columbia River crossings at Vantage, Midway, and the Hanford National Monument provide good open water foraging habitat and larger riparian trees for roosting. Wilson and Naneum creeks contain winter roost habitat for bald eagles. The YTC near Hanson and Alkali Canyon Creeks also contains winter roosting areas. No nest sites are known within 2 miles of any of the segments.

There have been no confirmed sightings of pygmy rabbits within the project area. The nearest recorded sighting was made in 1979 in the Rattlesnake Slope area of the Hanford Reservation, south of the proposed Wautoma substation (WDFW, 1995). The nearest existing population (and the only currently known population in Washington) is well northeast of the proposed project in Douglas County (WDFW, 1995, 66 FR 59734-59749). Surveys of the YTC in the mid 1990s did not find populations of pygmy rabbits (ENSR, 1995). Suitable habitat is present in the Hanford National Monument; however, limited surveys did not find any populations of pygmy rabbits (Brunkal, 2001).

Surveys of suitable habitat along the Preferred Alternative took place in 2002. No evidence of pygmy rabbits was found during these surveys.

3.5.9 Federal Species of Concern and State Listed Species

A list of state and federal listed wildlife species that are known to exist within the four counties crossed by the proposed project is presented in Table 3.5-1, *Possible Presence of State and Federal Listed Species Within Project Area*. This table indicates which of these species could possibly occur along each line segment.

Table 3.5-1
Possible Presence of State and Federal Listed Species Within Project Area

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type
Species Not Known to Be Present In Project Area				
Northern Spotted Owl	FT	SE	NONE	N
Marbled murrelet	FT	ST	NONE	N
Ash-throated flycatcher	FSC	SM	NONE	N
Gray wolf	FE	SE	NONE	N
Canada lynx	FT	ST	NONE	N
Grizzly bear	FT	SE	NONE	N
Pacific fisher	FSC	SE	NONE	N
Wolverine	FSC	SC	NONE	N
Western gray squirrel	FSC	ST	NONE	N
Potholes meadow vole	FSC		NONE	N
Cascades frog	FSC		NONE	N
Larch Mountain salamander	FSC	SS	NONE	N
Red-legged frog	FSC		NONE	N
Tailed frog	FSC	SM	NONE	N
Mardon skipper	FC	SE	NONE	N
Riparian, Open Water and Wetland Species				
Aleutian Canada goose	DM	ST	B, D, E, F, Fiber	M
Harlequin duck	FSC		B, D, E, F, Fiber	P
Common loon		SS	B, D, E, F, Fiber	M
Black tern	FSC	SM	B, D, E, F, Fiber	M
Caspian tern		SM	B, D, E, F, Fiber	M
Forster's tern		SM	B, D, E, F, Fiber	M
American white pelican		SE	B, D, E, F, Fiber	M
Bald eagle	FT	ST	ALL SEGMENTS	W
Osprey		SM	B, D, E, F, Fiber	B
Great blue heron		SM	B, D, E, F, Fiber	B
Black-crowned night heron		SM	B, D, E, F, Fiber	B
Lewis' woodpecker		SC	A, C, D, E, F, Fiber	B
Olive sided flycatcher	FSC		ALL SEGMENTS	P
Little Willow flycatcher	FSC		ALL SEGMENTS	P
Pacific western big-eared bat	FSC	SC	ALL SEGMENTS	P
Long-eared myotis	FSC	SM	ALL SEGMENTS	P
Long-legged myotis	FSC	SM	ALL SEGMENTS	P
Fringed myotis	FSC	SM	ALL SEGMENTS	P
Western small-footed myotis	FSC	SM	ALL SEGMENTS	P

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type
Yuma myotis	FSC		ALL SEGMENTS	P
Pallid bat		SM	ALL SEGMENTS	P
Northern leopard frog	FSC	SE	D, E, F, Fiber	P
Spotted Frog	FC	SE	ALL SEGMENTS	P
Woodhouse's Toad		SM	E, F, Fiber	B
Shrub-Steppe Species				
Northern goshawk	FSC	SC	ALL SEGMENTS	M
Golden eagle		SC	ALL SEGMENTS	B
Ferruginous hawk	FSC	ST	ALL SEGMENTS	B
Swainson's hawk		SM	ALL SEGMENTS	B
Prairie falcon		SM	ALL SEGMENTS	B
Peregrine falcon	FSC	SE	C, D, E, F, Fiber	B
Turkey vulture		SM	ALL SEGMENTS	B
Western bluebird	FSC	SM	ALL SEGMENTS	B
Sage sparrow		SC	ALL SEGMENTS	B
Sage thrasher		SC	ALL SEGMENTS	B
Long-billed curlew	FSC	SM	A, C, E, F, Fiber	B
Western sage grouse	FSC	ST	A, B, C, D, F	B
Loggerhead shrike	FSC	SC	ALL SEGMENTS	B
Grasshopper sparrow	FSC	SM	C	B
Sharp tailed grouse	FSC	ST	NONE	H
California bighorn sheep	FSC		B, D, E, F	P
White-tailed jackrabbit		SC	ALL SEGMENTS	B
Burrowing owl	FSC	SC	C, D, E, F, Fiber	B
Washington ground squirrel	FC	SC	D, E, F	H
Pygmy rabbit	FSC	SE	D, E, F, Fiber	H
Ord's kangaroo rat		SM	B, D, E, F, Fiber	P
Northern grasshopper mouse		SM	ALL SEGMENTS	P
Sagebrush vole		SM	ALL SEGMENTS	P
Merriam's shrew		SC	ALL SEGMENTS	B
Sagebrush lizard	FSC		ALL SEGMENTS	B
Nightsnake		SM	B, D, E, F, Fiber	P
Striped whipsnake		SC	ALL SEGMENTS	B
Persius' duskywing		SM	E	P

Federal Status	**State Status**	**Documented Occurrence Type**
FE = Endangered	SE = Endangered	P = Present (general presence)
FT = Threatened	ST = Threatened	B = Breeding
FC = Candidate	SS = Sensitive	M = Migrant
D = Delisted	SC = Candidate	W = Winter Resident
FSC = Species of Concern	SM = Monitor	N = Not Present
		H = Historically Present, Not Currently Present

Table has been updated for the FEIS.

3.6 Fish Resources

The study area includes creeks, lakes, and other water bodies that may support fish. Only streams or water bodies with perennial flows that are affected by the project are discussed. (See Map 6, *Fisheries*.) Some intermittent streams may have fish present at times during the year, but usually in limited areas near a source of perennial water.

The most significant fish resources found within the study area are endangered anadromous salmonids such as salmon and steelhead. These fish are born and reared in small streams, then migrate down the Columbia River to the ocean. After several years in the ocean, they migrate upstream back to their native streams to spawn. Resident salmonids such as bull trout and rainbow trout are also important resources, as are a number of other cold and warm water fish species.

3.6.1 Segment A

Segment A crosses eight fish-bearing streams that drain the Wenatchee Mountains north of the study area and one fish-bearing stream in the YTC. The major fish issue facing these streams is the lack of access between the Yakima River and the ***headwater*** areas due to obstructions from irrigation and agricultural operations in the lower sections.

For Your Information

Headwater *refers to the source of the river.*

3.6.1.1 Wilson-Naneum Creek Crossing

The Wilson-Naneum Creek Complex is one of the more productive small streams in the study area. Fish species present here include steelhead, spring chinook salmon, western brook lamprey, rainbow trout, cutthroat trout, brook trout, mountain whitefish, three-spine stickleback, speckled dace, longnose dace, bridgelip sucker, mountain sucker, redside shiner, and torrent sculpin (WDFW, 2001, WDFW, unpub.). There are currently no adult ***anadromous salmonids*** or lamprey spawning in the upper part of the creek due to obstructions, but migratory juvenile salmonids use the lower 2.1 miles as rearing habitat. At the site of the proposed crossing, there are no anadromous fish present, however the ***non-anadromous*** species mentioned above are likely to be present.

Anadromous *fish are ones that migrate up rivers from the sea to breed in fresh water.*

Salmonids *belong to the family Salmonidea, salmon, trout, and whitefish.*

Non-anadromous *fish are ones that do not migrate to the sea and back during their life cycle.*

Because the proposed crossing is at the very upper edge of the Kittitas Valley, the stream at this point is relatively unaffected by irrigation withdrawals and other agricultural activities. The habitat conditions near the proposed crossing are good, with clean substrate and good instream flows. Options 1 and 2, associated with the Sickler-Schultz Reroute, would cross different areas of Wilson Creek. Both areas have similar fish habitat.

3.6.1.2 Schnebly Creek Crossing

Schnebly Creek is a small stream with little suitable fish habitat near the study area. In summer, Schnebly Creek is dry where the project crosses it. In its upper reaches, the stream supports rainbow trout (WDFW, 2001, WDFW, unpub.). Fish may be present in the project area when flows are present, but they would most likely be passing through the area between more suitable habitat up-and downstream.

3.6.1.3 Coleman Creek Crossing

Fish species present in Coleman Creek are similar to those in Wilson and Naneum Creeks and include steelhead, spring chinook salmon, western brook lamprey, rainbow trout, cutthroat trout, brook trout, mountain whitefish, three-spine stickleback, speckled dace, longnose dace, bridgelip sucker, mountain sucker, redside shiner, and torrent sculpin. Bull trout were last observed in 1970 (WDFW, unpub.). Coleman Creek has been channelized and diverted into Naneum Creek and no longer has its natural mouth. There are currently no adult anadromous salmonid spawning in this creek due to obstructions, but migratory juvenile salmonids use the lower 0.5 mile as rearing habitat.

The lower reach of Coleman Creek has some of the best salmonid rearing habitat in the northern Kittitas Valley area. Higher upstream, the riparian zone of the valley portions of this stream is extensively impacted by grazing and other agricultural practices. The proposed crossing of Coleman Creek is just above the Kittitas Valley floor. The stream flows through a shallow canyon with a narrow riparian area. Stream habitat is good, with clean substrates, good water quality and good year-round flows. WDFW PHS data (WDFW, unpub.) indicate that fish are present only from the mouth upstream to a point approximately 2 miles below where the proposed line crosses. However, Renfrow (2001), and WDFW (unpub.) have indicated that the stream near the proposed crossing probably contains many of the species present lower in the system, except anadromous fish.

3.6.1.4 Cooke Creek Crossing

Fish species present in Cooke Creek include rainbow trout, cutthroat trout, and brook trout. No anadromous salmonids are present due to downstream obstructions (WDFW, unpub.).

Segment A crosses Cooke Creek at Coleman Canyon Road. The stream is divided into multiple small channels in this area. A good riparian area with large cottonwoods and willows exists upstream of Coleman Canyon Road. Downstream of the road, the riparian vegetation consists of smaller shrubs and trees. Stream flow is good in this area, although the split channels may limit available fish habitat.

Stream substrate appears clean and the riparian areas are good, although livestock are present in the area upstream of the crossing. Like Coleman Creek, the WDFW PHS data (2001) indicates that fish species are probably only present downstream several miles from the proposed crossing. However, Renfrow (2001) indicated that the three trout species were probably present higher in the drainage above the study area, and may be present where the proposed line crosses.

3.6.1.5 Caribou Creek Crossing

Fish species present in Caribou Creek are probably limited to rainbow trout (WDFW, 2001, WDFW, unpub.). No anadromous salmonids are present due to obstructions lower in the system. Segment A crosses Caribou Creek adjacent to a large cultivated field. The creek channel here is very narrow, with a marginal riparian area and intermittent flows. It is unlikely that fish are present in this reach of Caribou Creek.

3.6.1.6 Parke Creek Crossing

Fish species present in Parke Creek are probably limited to rainbow trout (WDFW, 2001, WDFW, unpub.). No anadromous salmonids are present due to downstream obstructions. Segment A spans Parke Creek from high ridges on either side of it. The creek here is narrow and possibly intermittent, with a marginal riparian area. It is unlikely that rainbow trout are present in this reach of Parke Creek.

3.6.1.7 Middle Canyon Creek

The only documented fish species in Middle Canyon Creek is rainbow trout (U.S. Army, 1996). However, chinook salmon and steelhead trout in the Columbia River probably use the lowest reach for resting and juvenile rearing on their migrations up and down the river (Renfrow, 2001). However, the proposed line crosses the intermittent headwaters area of Middle Canyon, where no fish habitat is available.

3.6.2 Segment B

The affected environments for Segment B Options B_{NORTH} and B_{SOUTH} are very similar and are discussed together as Segment B. The proposed project would cross one Johnson Creek perennial drainage (although a small portion of B_{NORTH} is in the Middle Canyon Creek watershed discussed in Segment A, Section 3.6.1.7) and the Columbia River between the northern end of Segment C and the Vantage Substation. The perennial drainages drain the northeastern corner of the YTC. Extensive past grazing, military maneuvers and other disturbances have caused changes in flow regimes and a general reduction in the quality of fish habitat within Johnson Creek.

3.6.2.1 Johnson Creek

Fish species present in Johnson Creek include rainbow trout, possibly steelhead, chinook salmon, three-spine stickleback, prickly sculpin, large scale sucker, and redside shiner (U.S. Army, 1996). Chinook salmon utilize only the lower end of the creek near the Columbia River for juvenile rearing, and steelhead may be present in the lower reaches (Renfrow, 2001).

Base flows in Johnson Creek are low, because of increases in peak flows and a reduction of infiltration capacity as a result of unvegetated soils becoming compacted after years of cattle grazing and military land uses. A general lack of riparian vegetation, coupled with low base flows, causes high water temperatures during the warmer months. This may limit the distribution of salmonids to the lower reaches of the stream and limit resident fish to reaches where water is present year-round.

Segment B crosses in the middle reach of Johnson Creek, thus anadromous salmonids are unlikely to be present, although the other species known to exist in the creek could be present.

3.6.2.2 Columbia River Crossing

For Your Information

Tailrace *is the part of the millrace below the turbine through which the spent water flows.*

The Columbia River hosts approximately 40 species of fish. Chinook salmon, sockeye salmon, steelhead, and Pacific lamprey use the Columbia River near the river crossing as a migration corridor between the ocean and upstream spawning areas, and for spawning and rearing. The Wanapum dam ***tailrace***, located directly underneath the proposed crossing, is an important fall chinook salmon spawning area (USDOE, 1999). Bull trout are occasionally present. Fish commonly pursued for sport include whitefish, small-mouth bass, sturgeon, catfish, walleye and perch. Rough fish such as squawfish, carp, suckers, and shiners are also present in large numbers (USDOE, 1999). The Columbia River is on the 303(d) list for high temperature, pH levels, and dissolved gas.

3.6.3 Segment C

Segment C crosses five major drainages, all of which drain the interior of the YTC directly to the Columbia River. Fish are present in five of the six drainages crossed (no fish are present in Cold Creek).

3.6.3.1 Johnson Creek

The crossing of Johnson Creek is similar to that discussed in Segment B.

3.6.3.2 Hanson Creek

Fish species present in Hanson Creek include eastern brook trout and fall chinook (U.S. Army, 1996). Chinook salmon utilize only the lower reach of the creek near the Columbia River for juvenile rearing, and are not present near the proposed crossing.

3.6.3.3 Alkali Canyon Creek

Fish species present in Alkali Canyon Creek include rainbow trout, eastern brook trout, and fall chinook (U.S. Army, 1996). Chinook salmon utilize only the lower reach of the creek near the Columbia River for juvenile rearing, and are not present near the proposed crossing.

3.6.3.4 Corral Canyon Creek

Chinook salmon is the only fish species present in Corral Canyon Creek. They only utilize the lower reach of the creek near the Columbia River for juvenile rearing, and are not present near the proposed crossing (U.S. Army, 1996).

3.6.3.5 Cold Creek

No fish are known to be present in Cold Creek.

3.6.4 Segment D

Segment D crosses three drainages: Lower Crab Creek, the Columbia River, and Cold Creek. A series of irrigation canals and drains are crossed on the Wahluke Slope, however these are not considered fish habitat. Depending on conditions and the availability of stable flows, fish could exist temporarily in some canals, but would most likely be introduced by humans or carried by birds from other water bodies and would not continue to thrive.

3.6.4.1 Lower Crab Creek

Fish species present in Lower Crab Creek include rainbow trout, brown trout, chinook salmon, and possibly a remnant steelhead population (WDFW, 2001, Renfrow, 2001). Segment D crosses the extreme lower reach of Lower Crab Creek just upstream of its confluence with the Columbia River. Lower Crab Creek could be used by most of the 40 Columbia River fish species on a temporary basis as well.

3.6.4.2 Columbia River

The Columbia River is habitat for approximately 40 species of fish. Like the Segment B crossing, chinook salmon, sockeye salmon, steelhead, and Pacific lamprey use the Columbia River near the river crossing as a migration corridor to upstream spawning areas and for spawning and rearing. Fish commonly pursued for sport include whitefish, small-mouth bass, sturgeon, catfish, walleye and perch. Rough fish such as squawfish, carp, suckers, and shiners are also present in large numbers (USDOE, HCP EIS, 1999).

The area directly under the Segment D crossing, just upstream from the Vernita Bridge, is an important spawning area for fall chinook salmon. This area represents the northern extent of the naturally spawning Hanford Reach population of fall chinook, which is approximately 50-60 percent of the total fall chinook runs in the Columbia River (USDOE, HCP EIS, 1999).

3.6.4.3 Cold Creek

No fish are known to be present in Cold Creek in the vicinity of the Segment D crossing, however, YTC staff have observed fish in pools in the YTC. The species are unknown (YTC, 2002).

3.6.5 Segment E

Segment E crosses two lakes and only two major drainages: Lower Crab Creek and the Columbia River. Like Segment D, a series of irrigation canals and drains are crossed on the Wahluke Slope, however these are not considered to be fish habitat.

3.6.5.1 No Wake Lake

No Wake Lake is a private constructed lake just north of Lower Crab Creek used for water skiing. It contains warm water fish species.

3.6.5.2 Lower Crab Creek

Segment E crosses Lower Crab Creek several hundred feet upstream of proposed Segment D. Fish habitat and species are similar to those discussed in the Segment D section.

3.6.5.3 Saddle Mountain Lake

Saddle Mountain Lake contains only warmwater fish species such as yellow perch, pumpkinseed, bluegill, and crappie.

3.6.5.4 Columbia River

Segment E crosses the Hanford Reach of the Columbia River. The fish species and habitats are similar to the crossing described for Segment D.

3.6.6 Segment F

Segment F crosses Nunnally Lake and two major drainages: Lower Crab Creek and the Columbia River. However, unlike Segments D and E, each drainage has wetland areas and ponds associated with each of these crossings.

3.6.6.1 Nunnally Lake

Nunnally Lake is a pothole lake in the Lower Crab Creek valley. It is a high-use recreational area. Rainbow trout are stocked for sport fishing. Warmwater species such as yellow perch, pumpkinseed, bluegill, and crappie may be present.

3.6.6.2 Lower Crab Creek

Segment F crosses Lower Crab Creek several hundred feet upstream of proposed Segments D and E. Fish habitat and species are similar to those discussed in Segment D.

3.6.6.3 Columbia River

Segment F crossing of the Columbia River uses the same alignment as proposed Segment E crossing and has fish habitat and species similar to those discussed in Segment D.

For Your Information

*A **wasteway** is a drainage carrying irrigation return flow.*

3.6.7 Fiber Optic Line

Several lakes, wetlands, and **wasteways** are crossed by the fiber optic line that could contain fish. These areas contain water due to seepage and return flow from Columbia Basin Project irrigation waters. Sand Hollow, a stream supported entirely by irrigation return flow, contains summer steelhead and fall chinook in the lowest reach where the fiber optic line would cross (WDFW, 2001). Lynch coulee also supports a small run of steelhead where the project crosses (WDFW, 2001). Several of the lakes in the Quincy Lakes Wildlife Area have fish that were introduced for sportfishing purposes, most notably including rainbow trout.

3.6.8 Threatened and Endangered Species

The project area is within the range of three species (which includes three ***Evolutionarily Significant Units***, or ESU's and one ***Distinct Populations Segment***, or DPS) of threatened or endangered fish: Upper Columbia River spring-run chinook salmon, Upper Columbia River steelhead, Middle Columbia River steelhead, and bull trout (See Table 3.6-1, *Fish Species Presence*, for their distribution within the project area). A full description of these species can be found in Appendix G, *Fish and Wildlife Technical Report*.

*An **Evolutionarily Significant Unit (ESU)** is a population of a species with a distinct evolutionary history as defined by the National Marine Fisheries Service.*

*A **Distinct Population Segment (DPS)** is a population of a species with a distinct evolutionary history as defined by the U.S. Fish and Wildlife Service.*

Table 3.6-1
Fish Species Presence

Perennial Water Name[1]	Segment Intercepting Waterbody							Fish Species Present In Waterbody[2]	Comments
	A	B	C	D	E		F		
Wilson Creek	X							Chinook salmon (Federal Endangered, State Candidate), Mountain sucker (State Candidate), Rainbow trout, Cutthroat trout, Brook trout, Mountain whitefish, 3-Spine stickleback, Speckled dace, Longnose dace, Redside shiner, Torrent sculpin, Brook lamprey	Wilson Creek has high quality fish habitat in the project area. Chinook salmon are only present in the lowest mile of the creek, and not in the project area. Mountain suckers are probably found in the project area.
Naneum Creek	X							**Chinook salmon (Federal Endangered, State Candidate)**, **Mountain sucker (State Candidate)**, Rainbow trout, Cutthroat trout, Brook trout, Mountain whitefish, 3-Spine stickleback, Speckled dace, Longnose dace, Redside shiner, Torrent sculpin, Brook lamprey	Naneum Creek has high quality fish habitat in the project area. Chinook salmon are only present in the lowest mile of the creek, and not in the project area. Mountain suckers are probably found in the project area.
Cave Canyon Creek	X							None	Fish habitat is present, but fish are not documented in this creek.
Schnebly Creek	X							Rainbow trout	Rainbow trout are present in the project area.
Coleman Creek	X							**Chinook salmon (Federal Endangered, State Candidate)**, **Bull trout (Federal Threatened, State Candidate)**, Rainbow trout	Chinook salmon habitat is high quality, but limited to the lowest three miles of the stream. Bull trout have not been observed since 1970.
Cooke Creek	X							Rainbow trout, Cutthroat trout, Brook trout	Cooke Creek is split into several small channels in the project area, which may limit the available fish habitat.
Caribou Creek	X							Rainbow trout	Caribou Creek has marginal fish habitat (stream is intermittent where project crosses).
Parke Creek	X							Rainbow trout	Rainbow trout are present in the project area.
Middle Canyon Creek	X							Rainbow trout	Project crosses the intermittent headwaters of Middle Canyon Creek. It is unlikely that habitat in this area is utilized by fish.
Johnson Creek		X	X					**Chinook salmon (Federal Endangered, State Candidate)**, **Steelhead trout (Federal Endangered/Threatened, State Candidate)**, Rainbow trout, 3-Spine stickleback, Prickly sculpin, Large scale sucker, Redside shiner	Juvenile chinook salmon only use the lowest reach of the stream for resting as they migrate down the Columbia River. Steelhead may spawn and rear in the lowest reach near the mouth. Resident fish habitat is degraded in the project area due to military operations, grazing and fires, but fish are present.
Hanson Creek			X					**Chinook salmon (Federal Endangered, State Candidate)**, Rainbow trout, Brook trout	Juvenile chinook salmon only use the lowest reach of the stream for resting as they migrate down the Columbia River. Resident fish habitat is degraded in the project area due to military operations, grazing and fires, but fish are present.

Perennial Water Name[1]	Segment Intercepting Waterbody							Fish Species Present In Waterbody[2]	Comments
	A	B	C	D	E		F		
Alkali Canyon Creek			X					**Chinook salmon (Federal Endangered, State Candidate)**, Rainbow trout, Brook trout	Juvenile chinook salmon only use the lowest reach of the stream for resting as they migrate down the Columbia River. Resident fish habitat is degraded in the project area due to military operations, grazing and fires, but fish are present.
Corral Canyon Creek			X					**Chinook salmon (Federal Endangered, State Candidate)**	Juvenile chinook salmon only use the lowest reach of the stream for resting as they migrate down the Columbia River. Resident fish habitat is degraded in the project area due to military operations, grazing and fires, and fish are not present.
Cold Creek			X	X				None	Cold Creek is intermittent in the project area, and no fish are present.
Crab Creek				X	X		X	**Chinook salmon (Federal Endangered, State Candidate), Steelhead trout (Federal Endangered/Threatened, State Candidate)**, Rainbow trout, Brown trout, Various warmwater fish species	Crab Creek supports a wide variety of fish, including many of those found in the Columbia River.
Nunnally Lake							X	Rainbow trout, various warmwater species	Nunnally Lake is stocked with Rainbow trout for sportfishing.
Saddle Mountain Lake				X	X			Various warmwater species	Saddle Mountain Lake is an irrigation return flow lake.
Columbia River		X		X	X		X	**Chinook salmon (Federal Endangered, State Candidate)**, **Steelhead trout (Federal Endangered/Threatened, State Candidate)**, **Pacific lamprey**, Brook lamprey, Various warmwater species (40 different species all together)	The Columbia River supports approximately 40 different species of fish, and is the major migration corridor for anadromous species.
Sand Hollow							X	**Steelhead trout, chinook salmon**	Irrigation return flow supports spawning in lower 2 miles.

[1] Only streams or lakes that contain water year around are listed here.

[2] Fish species that may be present in the waterbody. In some cases fish may be present somewhere in the waterbody, but not where the proposed project crosses it. Bold species are federal or state listed species.

Table has been updated for the FEIS.

3.7 Land Use

The study area is defined as the proposed ROW width plus the area between the existing ROW and the new ROW where the lines are not adjacent. The study area includes both private and public lands and avoids all incorporated areas. (See Map 7, *Land Ownership*.)

3.7.1 Location of Study Area

Line segments cross private lands and publicly administered lands in four Washington counties: Kittitas, Grant, Benton, and Yakima. See Table 3.7-1, *Counties Crossed by Segment*. Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, lists the distance of private and publicly administered lands crossed. Map 7, *Land Ownership*, shows land ownership within the project area. Map 8, *Hanford Site*, shows a detail of public lands on the Hanford Site. Appendix H, *Consistency with State and Local Government Regulations*, discusses the local government regulations for these counties.

Table 3.7-1
Counties Crossed by Segment

Line Segment	County			
	Kittitas	Grant	Benton	Yakima
A	✓			
B	✓	✓		
C	✓		✓	✓
D		✓	✓	
E		✓	✓	
F		✓	✓	

Table 3.7-2
Private and Publicly Owned Lands in Project Area

Administering Agency	Distance and Percentage of Each Segment							Total Distance
	A	B NORTH	B SOUTH	C	D	E	F	
Private	**18.15 mi 65.9%**	**1.06 mi 11.6%**	**1.06 11.2%**	**5.15 mi 17.1%**	**15.74 mi 58.9%**	**8.97 mi 35.5%**	**0.57 mi 1.7%**	**50.7 mi 31.5%**
DNR	*2.73 mi 9%*	*0%*	*0.03 mi 0.3%*	*0.39 mi 1.3%*	*2.0 mi 7.5%*	*0.57 mi 2.3%*	*2.54 mi 7.8%*	*8.26 mi 5.1%*
WDFW	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0.8 mi 2.4%*	*0.8 mi 0.5%*
BLM	*0.88 mi 3.2%*	*0.64 mi 7.0%*	*0.64 mi 6.8%*	*0.22 mi 0.7%*	*2.86 mi 10.7%*	*4.88 mi 19.3%*	*12.84 mi 39.2%*	*22.96 mi 14.3%*
DOD	*5.78 mi 21.0%*	*7.03 mi 77.0%*	*7.34 mi 77.5%*	*24.3 mi 80.8%*	*0%*	*0%*	*0%*	*44.45 mi 27.6%*
BOR	*0%*	*0.4 mi 4.4%*	*0.4 mi 4.2%*	*0%*	*1.82 mi 6.8%*	*3.98 mi 15.8%*	*4.35 mi 13.3%*	*10.95 mi 6.8%*
USFWS	*0%*	*0%*	*0%*	*0%*	*0.53 mi 1.9%*	*0.96 mi 3.8%*	*0%*	*1.49 mi 0.9%*
USDOE	*0%*	*0%*	*0%*	*0%*	*3.79 mi 14.2%*	*5.9 mi 23.4%*	*11.66 mi 35.6%*	*21.35 mi 13.3%*
Total Public	**9.39 mi 34.1%**	**8.07 mi 88.4%**	**8.41 mi 88.8%**	**24.91 mi 82.9%**	**11.0 mi 41.1%**	**16.29 mi 64.5%**	**32.19 mi 98.3%**	**110.26 mi 68.5%**
Total Distance	**27.54 mi**	**9.13 mi**	**9.47 mi**	**30.06 mi**	**26.74 mi**	**25.26 mi**	**32.76 mi**	**160.96 mi**

This table has been updated for the FEIS.

3.7.1.1 Kittitas County

Kittitas County lies within the upper Yakima River watershed and on the east side of the Cascade Mountains. Mountains and steep hills ring an extensive irrigated area known as the Kittitas Valley where most of the County's residents live. Major irrigation projects of the 1940's and 50's distributed water to the valley floor, turning arid lands into productive farmland.

Segment A is entirely within Kittitas County. The majority of Segment B and a portion of Segment C are also within the County. Segments A and B cross both private lands and publicly administered lands. Segment C in Kittitas County would be located completely on publicly administered lands.

3.7.1.2 Grant County

The Columbia River flows in a deep valley along the west and southwestern boundary of Grant County. The County is a state and national leader in the production of wheat, corn, hay, potatoes, and several tree fruits and is a major livestock production center. Agricultural areas are concentrated throughout the County and the location of agriculture has been strongly influenced by the construction of irrigation facilities.

A small portion of Segment B and the majority of Segments D, E, and F are located within the County. These line segments cross both private lands and publicly administered lands.

3.7.1.3 Benton County

Benton County is located in the central part of the Columbia Basin. The principal land use is commercial dryland and irrigated agriculture with its related industries such as storage, shipping, processing, and sales of chemicals and equipment. Irrigated crop production and dryland agriculture is located throughout the agricultural lands designation. It is estimated that 17 percent of Benton County is irrigated land and 50 percent is range and dryland agriculture. Major crops in Benton County are wheat, corn, potatoes, apples, cherries, hops, mint, alfalfa hay, and wine grapes. Beef cattle are also raised in the County.

Of the overall study area, a small portion of Segment D and even smaller portions of Segments C, E, and F traverse through and terminate in Benton County. Segments C and D would cross both private lands and publicly administered lands. Segments E and F would only cross publicly administered lands.

3.7.1.4 Yakima County

Agriculture and related industries are the leading industries in Yakima County. The location of agriculture has been strongly influenced by the construction of irrigation facilities. Cultivated agriculture in Yakima County is heavily concentrated in and around the valley floors, while grazing lands and most orchards are located along many of the hillsides.

Only Segment C would pass through Yakima County, on private lands as well as publicly administered lands.

3.7.2 Land Uses in Study Area

Table 3.7-3, *Land Uses Crossed by Each Line Segment*, identifies the length of various land uses that are crossed by each segment. Public and private land uses are combined for this table.

Table 3.7-3
Land Uses Crossed by Each Line Segment

Land Use	Distance and Percentage of Each Segment							Total Distance
	A	B NORTH	B SOUTH	C	D	E	F	
Commercial, Industrial, and Transportation	0.17 mi 0.6%	0.02 mi 0.2%	0.02 mi 0.2%	0.02 mi 0.1%	0.31 mi 1.2%	0.04 mi 0.2%	0.06 mi 0.2%	0.64 mi 0.4%
Residential	0%	0%	0%	0.01 mi 0.1%	0.02 mi 0.1%	0%	0%	0.03 mi 0.1%
Forest	0.5 mi 1.8%	0%	0%	0.2 mi 0.7%	0.11 mi 0.4%	0.01 mi 0.1%	0.01 mi >0.1%	0.83 mi 0.5%
Range	25.92 mi 94.1%	8.51 mi 93.2%	8.54 mi 90.2%	29.38 mi 97.7%	16.23 mi 60.7%	17.64 mi 69.8%	27.63 mi 84.3%	133.85 mi 83.2%
Agricultural	0.51 mi 1.9%	0%	0%	0%	8.75 mi 32.7%	4.77 mi 18.9%	0.34 mi 1.0%	14.37 mi 8.9%
Water	0%	0.49 mi 5.4%	0.49 mi 5.2%	0.02 mi 0.1%	0.3 mi 1.1%	0.61 mi 2.4%	0.5 mi 1.5%	2.41 mi 1.5%
Unknown	0.44 mi 1.6%	0.11 mi 1.2%	0.42 mi 4.4%	0.43 mi 1.4%	1.02 mi 3.8%	2.19 mi 8.7%	4.22mi 12.9%	8.83 mi 5.5%
Total Distance	**27.54 mi**	**9.13 mi**	**9.47 mi**	**30.06 mi**	**26.74 mi**	**25.26 mi**	**32.76 mi**	**160.96 mi**

This table has been updated for the FEIS.

The majority of land crossed by the various segments is rangeland, approximately 133.85 miles or 83.2 percent of the total lands crossed. The second most frequently crossed lands are used for agricultural purposes, approximately 14.37 miles or almost 9 percent of the total lands crossed.

Map 9, *Land Use Cover*, shows the various land uses along the different line segments.

3.7.2.1 Private Lands

As shown in Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, roughly 32 percent of the study area is located on privately owned land. Private land ownership in the study area is characterized by open rangeland, agricultural land, open space, some rural residential, and a limited amount of quarrying. Table 3.7-4, *Distance of Private Land Uses Crossed by Project Area*, identifies the total distance each land use would be crossed by the various line segments on privately owned lands.

Table 3.7-4
Distance of Private Land Uses Crossed by Project Area

Land Use	Distance of Each Segment							Total Distance
	A	B_{NORTH}	B_{SOUTH}	C	D	E	F	
Commercial, Industrial, and Transportation	0.13 mi	0.02 mi	0.02 mi	0.02 mi	0.24 mi	0	0	**0.43 mi**
Residential	0	0	0	0	0.01 mi	0	0	**0.01 mi**
Forest	0.5 mi	0	0	0	0.11 mi	0	0	**0.61 mi**
Range	16.78 mi	0.54 mi	0.54 mi	5.11 mi	6.83 mi	2.34 mi	0.58 mi	**32.72 mi**
Agricultural	0.42 mi	0	0	0	7.7 mi	4.28 mi	0	**12.4 mi**
Water	0	0.46 mi	0.46 mi	0	0.04 mi	0.19 mi	0	**1.15 mi**
Unknown	0.31 mi	0.04 mi	0.04 mi	0.02 mi	0.81 mi	2.16 mi	0	**3.38 mi**
Total Distance	**18.14 mi**	**1.06 mi**	**1.06 mi**	**5.15 mi**	**15.74 mi**	**8.97 mi**	**0.58 mi**	**50.7 mi**

This table has been updated for the FEIS.

3.7.2.2 Public Agency Administered Lands

In addition to the privately held lands, there are seven public agencies that administer lands crossed in the four counties. The public land areas crossed are under the administration of two Washington State agencies, DNR and WDFW, and five federal agencies: BLM, DOD, BOR, USFWS, and USDOE. Table 3.7-5, *State and Federal Agency Land by County*, identifies the state or federal agencies that administer land crossed per county.

Table 3.7-5
State and Federal Agency Land by County

Agency	County			
	Kittitas	Grant	Benton	Yakima
DNR	✓	✓	✓	✓
WDFW		✓		
BLM	✓	✓	✓	
DOD	✓			✓
BOR	✓	✓		
USFWS		✓		
USDOE		✓	✓	

As shown in Table 3.7-6, *Distance of Public Land Uses Crossed by Project Area*, roughly 92 percent of the study area crosses rangeland while located on publicly administered land. Typical land uses on the publicly owned lands in the study area include predominantly rangeland, agricultural, wildlife habitat, recreation, and limited commercial, industrial, or transportation-related uses. Table 3.7-6, *Distance of Public Land Uses Crossed by Project Area*, identifies the total distance each line segment would cross various land uses on lands administered by a public agency.

Table 3.7-6
Distance of Public Land Uses Crossed by Project Area

Land Use	Distance of Each Segment							Total Distance
	A	B NORTH	B SOUTH	C	D	E	F	
Commercial, Industrial, and Transportation	0.04 mi	0	0	0	0.07 mi	0.04 mi	0.06 mi	**0.21 mi**
Residential	0	0	0	0.01 mi	0.01 mi	0	0	**0.02 mi**
Forest	0	0	0	0.2 mi	0	0.01 mi	0.01 mi	**0.22 mi**
Range	9.14 mi	7.97 mi	8.0 mi	24.27 mi	9.4 mi	15.3 mi	27.05 mi	**101.13 mi**
Agricultural	0.09 mi	0	0	0	1.05 mi	0.49 mi	0.34 mi	**1.97 mi**
Water	0	0.03 mi	0.03 mi	0.02 mi	0.26 mi	0.42 mi	0.5 mi	**1.26 mi**
Unknown	0.13 mi	0.07 mi	0.38 mi	0.41 mi	0.21 mi	0.03 mi	4.22 mi	**5.45 mi**
Total Distance	**9.4 mi**	**8.07 mi**	**8.41 mi**	**24.91 mi**	**11.0 mi**	**16.29 mi**	**32.18 mi**	**110.26 mi**

This table has been updated for the FEIS.

3.7.2.3 Aircraft Uses

Four airports were identified in proximity to the segments (Table 3.7-7, *Airports in Proximity*). None of the airports are located directly within the study corridors of the segments. However, each airport is close enough to the respective segments that flight patterns could be affected.

Table 3.7-7
Airports in Proximity

Airport	Closest Segment	Approximate Location
Bowers Field Airport	A	T18N, R18E, Sec 23 & 24
Yakima Training Center	A, B, C	Segments cross areas where military flights take place during training exercises
Mattawa Air Strip	E	T14N, R25E, Sec 5
Christensen Brothers Wahluke Strip	D	T14N, R24E, Sec 10 & 15

This table has been updated for the FEIS.

The Bowers Field Airport, two miles north of Ellensburg, is located approximately five miles south of the Vantage substation. This airport utilizes the area for flight instruction, local general aviation, and transient general aviation.

In addition to the use of the airspace around the segments by commercial and private aircraft, the U. S. Army utilizes the airspace over the YTC for military training flights and support of ground maneuvers. During Fiscal Year 2001 (October 2000 – October

2001), the Army indicates there were 1,462 flights across the YTC. They expect this number to increase in the future.

3.7.3 Segment A

Segment A and Options 1 and 2 of the Sickler-Schultz Reroute, approximately 27.5 miles, would be located entirely within Kittitas County and, as shown in Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, would cross privately owned lands (roughly 66 percent of the segment) as well as publicly administered lands (roughly 34 percent).

3.7.3.1 Private Land

Rangeland is the predominate private land use along Line Segment A; approximately 16.8 miles of the 18 miles of private land crossed by the segment. Rangeland is also the land use along both options of the Sickler-Schultz Reroute. Less than one-half mile of each of the following land uses — commercial, industrial and transportation, forest, agricultural, and unknown — would be crossed by this segment.

For Your Information

*A **shrub-steppe** habitat is a shrub and grass dominated community found in arid areas.*

The rangeland is used for raising and grazing livestock and is predominately ***shrub-steppe*** over varied terrain consisting of numerous ridges and valleys that traverse the eastern side of Kittitas County.

Farm and agricultural uses are typified as dryland agricultural operations. The predominant crops are hay and wheat.

Vacation homes, and people seeking a rural lifestyle are increasing the residential development in the study area. Table 3.7-4, *Distance of Private Land Uses Crossed by Project Area*, does not reflect the presence of residential land uses along this segment because the land on which these residences are located is designated for rangeland or agricultural purposes; however, residential land uses are permitted in the area with minimum lot sizes of 20 acres.

Mineral resource lands of long-term commercial significance are not specifically zoned along the segment but have been identified on a Kittitas County Comprehensive Plan map. The study area crosses an existing quarry operation along the south side of an existing transmission line.

There are some limited forest resources in the study area. However, these areas are not considered harvestable timber resources (Neil White, Kittitas County Planning Director, Pers. Comm., April 2001).

3.7.3.2 Public Land

Public land crossed by this segment is under the administration of one state agency, DNR, and two federal agencies, BLM, and DOD. Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, provides the distance Segment A would cross these public lands (9.39 miles), and Table 3.7-6, *Distance of Public Land Uses Crossed by Project Area*, shows that the primary use of these public lands is rangeland (9.14 miles).

DNR Lands – The majority of DNR lands crossed by the project area are located along the northern half of the line segment, including the northern portion of the Sickler-Schultz Reroute, Options 1 and 2. This land is considered transition land by DNR and is designated as agricultural land. However, the land is managed for its highest and best use and for this particular area that use is rangeland.

BLM Lands – The BLM land along Segment A is used as rangeland and would support land use activities consistent with this type of land at other locations along the other segments.

DOD Lands (YTC) – The largest area of federal land crossed by the study area is the YTC (5.8 miles). A U.S. military reservation, this segment is administered by the U.S. DOD and is a sub-installation of Fort Lewis. The total size of the YTC is 511.64 square miles; split roughly in half between Kittitas and Yakima Counties.

The YTC is divided into 10 different watershed complexes and 5 different land use zones. Military training exercises vary according to the land use zones within the specific complexes and certain maneuvers in one complex may not be present in the same land use zone in a different complex.

Segment A would cross the northern border of the YTC and continue south through the Middle Canyon Complex ending just inside the Johnson Creek Complex; completely within Kittitas County. The segment crosses three land use zones; Land Bank Zone, General Use Zone (slopes 0 to 15 percent), and General Use Zone (slopes >15 percent). Typical training maneuvers in the study area consist of armor and mechanized infantry movements, firing exercises, tanks and other vehicle movements, and military training exercises.

For Your Information

Native American traditional cultural practices *can include gathering plants and roots for medicinal use and religious ceremonies.*

Non-military land uses within the YTC include ***Native American traditional cultural practices*** by the Yakama Indian Nation and the Wanapum Band as well as limited recreational hunting and other outdoor activities.

3.7.4 Segment B

Options B_{NORTH} and B_{SOUTH} are different in length, but cross the same types of lands and are discussed together.

3.7.4.1 Private Lands

Approximately 1.06 miles of Options B_{NORTH} and B_{SOUTH} would be located on private lands. Of this amount, roughly one-half of this land is used as rangeland, with the Columbia River crossing, or open water, comprising all but 0.06 mile of the remaining portion.

The rangeland supports livestock activities and is predominantly steppe and shrub-steppe over varied terrain, consistent with the rangeland activities and terrain along all other segments.

3.7.4.2 Public Lands

Public land crossed by this segment is under the administration of one state agency, DNR, and three federal agencies, BLM, DOD, and BOR. Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, provides the distance Options B_{NORTH} and B_{SOUTH} would cross these public lands (8.07/8.41 miles). Table 3.7-6, *Distance of Public Land Uses Crossed by Project Area*, shows that rangeland is the predominant land use.

DNR Lands – A very small portion of Option B_{SOUTH} would cross DNR administered lands. The use of these lands is for the John Wayne Trail. Further discussion of this trail can be found in Section 3.10, *Recreational Resources*, of this document.

BLM Lands – Less than one mile of BLM lands would be crossed by B_{NORTH} and B_{SOUTH}. This land is rangeland, but is also used by the YTC for its training operations.

DOD Lands (YTC) – The majority of Options B_{NORTH} and B_{SOUTH} (roughly 77 and 78 percent of each option respectively) would be located within the YTC. Both options would traverse the Johnson Creek Complex and two land use zones, General Use Zone (slopes 0 to 15 percent) and General Use Zone (slopes > 15 percent), before exiting the YTC along its eastern border.

Tanks and other vehicle movements, as well as training exercises take place within the Johnson Creek Complex.

BOR Lands – Options B_{NORTH} and B_{SOUTH} also cross BOR lands. These lands are administered and managed to maintain and develop water distribution systems, such as irrigation canals, that move water to the fertile agricultural lands of the area.

3.7.5 Segment C

3.7.5.1 Private Lands

Segment C would cross privately owned lands in a scarcely populated area between the YTC in Yakima County and the new substation site in Benton County (Wautoma Substation). There is no private land crossed by Segment C in Kittitas County.

For Your Information

For this document, agriculture is defined as row crops, pasture, fallow fields, orchards, crops and grains. Land that we refer to as rangeland is grassland and shrubland that may be used for grazing or the movement of livestock.

The area is within the Blackrock Valley and its terrain is gently rolling hills at the foot of the Saddle Mountain Range. While some parts of this area are used for dryland agriculture, the main use of the area that would be crossed by Segment C is rangelands.

In Benton County, Segment C would cross land that is sparsely inhabited rural-agricultural land. The landscape is characterized by rolling hills cut by drainages from the Saddle Mountain Range. As in Yakima County, the area is more commonly used for rangeland instead of agricultural purposes.

3.7.5.2 Public Lands

Public land crossed by this segment is under the administration of one state agency, DNR, and two federal agencies, BLM, and DOD. Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, shows that Segment C would cross 24.91 miles of public lands. Table 3.7-6, *Distance of Public Land Uses Crossed by Project Area*, shows that the predominant land use is rangeland.

Reminder

See Map 7, Land Ownership, for location of the John Wayne Trail.

DNR Lands – A small portion of Segment C would cross DNR administered lands. This land is at the northern end of the segment where the John Wayne Trail is crossed, and near the southern end of the segment. The DNR land at the southern end is used as rangeland.

DOD Lands (YTC) – The majority of Segment C (roughly 81 percent) would be located in the YTC. The segment would traverse three land use zones, Land Bank Zone, General Use Zone (slopes 0 to 15 percent) and General Use Zone (slopes >15 percent) and five watershed complexes, Johnson Creek, Hanson, Alkali Canyon, Corral Canyon, and Cold Creek.

The land use activities in Johnson Creek would be the same as those describe for Segment B.

The military conducts ground maneuvers, live fire artillery, mortar training, and water exercises within the Hanson Complex.

Live fire training for the infantry, tanks, and helicopters as well as light infantry maneuvers and small unit operations are conducted within the Alkali Canyon and Corral Canyon Complexes. Due to the steep slopes in these two complexes, parachute drops are used to deliver supplies to the infantry.

Cold Creek Complex supports track vehicle and light infantry maneuvers.

Throughout these complexes low flying aircraft such as helicopters, F-18s and A-10s are used to support the ground maneuvers.

3.7.6 Line Segment D

3.7.6.1 Private Lands

Reminder

See Map 9, Land Use Cover.

Segment D would cross 7.7 miles of private agricultural lands. This is the largest amount of agricultural lands crossed by any of the line segments. The segment would also cross 6.83 miles of rangeland. The segment would cross less than one-half mile of each of the following land uses: commercial, industrial and transportation, residential, forest, water, and unknown.

About 29 percent of the land along the segment is privately owned land used for agricultural purposes. The agricultural areas are composed mainly of irrigated lands with highly productive soil that is generally suited to crops, such as grains and vegetables, agricultural-related industries, and livestock maintenance. Vineyards and orchards are also present along the segment.

Dryland agricultural practices also occur along the study area for Segment D. Dryland agricultural land is primarily for grain or feed crop production.

As Table 3.7-3, *Land Uses Crossed by Each Line Segment*, indicates, Segment D would cross 8.8 miles of agricultural land.

Private rangeland accounts for approximately 26 percent of the lands crossed by this line segment. This land is used for livestock and is predominantly steppe and shrub-steppe over varied terrain.

The remaining portions of this segment would cross areas of Grant County that have been designated as rural in nature. Such areas are those not suitable for intensive farming and generally do not attract large residential development. Some areas near the western end of Crab Creek have been designated as open space, which further limits the ability to develop the land.

Limited rural-residential structures are also located along the segment. Maximum residential density in the rural areas of Grant County is one dwelling unit per 20 acres.

3.7.6.2 Public Lands

Public lands crossed by this segment are under the administration of one state agency, DNR, and four federal agencies, BLM, BOR, USFWS, and USDOE. Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, provides the distance Segment D would cross these public lands (11.0 miles) and Table 3.7-6, *Distance of Public Land Uses Crossed by Project Area*, shows that the predominant land use is rangeland (9.4 miles) and 1.6 miles of the public lands are agricultural, commercial, industrial and transportation, residential, open water, and unknown.

DNR Lands – DNR lands would be crossed by Segment D in Grant County and Benton County. In Grant County this land is managed for agricultural purposes and in Benton County it is used as rangeland.

BLM Lands (Saddle Mountain Management Area) – Roughly 3.0 miles of BLM land would be crossed by this segment. This BLM land is located north of the agricultural areas in Grant County and is the western end of the Saddle Mountain Management Area. This land is managed for multiple purposes, such as mining, rangeland, recreation, and wildlife habitat.

BOR Lands – The BOR lands that would be crossed by this segment are located at the north end of the segment and along the south face of the Saddle Mountains. These lands are administered and managed to maintain and develop the water distribution system, such as irrigation canals, that move water to the fertile agricultural lands of the area.

USFWS Lands (Columbia National Wildlife Refuge) – Segment D would cross the westernmost part of the Columbia National Wildlife Refuge near Crab Creek. This area is an isolated three quarters of a Section between Crab Creek and the base of the Saddle Mountains. This land is managed for wildlife habitat.

USDOE Lands (Hanford Site and Hanford Reach National Monument) – Map 7, *Land Ownership*, illustrates the boundaries of the Hanford Site and its management units. The Hanford Reach National Monument is shown on Map 8, *Hanford Site*. The land crossed on the Hanford Site is made up of large tracts of land originally used by the USDOE as a protective buffer zone for safety and security purposes. The area remains largely undisturbed, preserving a biological and cultural resource setting unique in the Columbia Basin region.

The Hanford Reach National Monument forms a C-shaped region bisected by the Hanford Reach of the Columbia River. The lands within the monument are divided into five major management units: Fitzner-Eberhardt Arid Lands Ecology Reserve, Saddle Mountain Unit, and Wahluke Unit administered by the USFWS; and the McCee-Riverlands Unit and the Columbia River Islands/Dunes Unit administered by the USDOE.

Segment D crosses the far western part of the Saddle Mountain Unit of the Hanford Reach National Monument and has a land use designation of Preservation.

The study area also crosses the Hanford Reach of the Columbia River, which was found suitable for inclusion in the National Wild and Scenic Rivers system under "Recreational River" classification in the National Park Service's Hanford Reach of the Columbia River Comprehensive Conservation Study/EIS in June 1994. The Hanford Reach is currently under the interim protection as directed by Public Law 100-605, as amended by Section 404 (Hanford Reach Preservation) of Public Law 104-333. The USFWS is responsible for overseeing interim management protection.

3.7.7 Segment E

3.7.7.1 Private Lands

Agricultural lands and rangeland make up about 74 percent of the private land uses crossed by Segment E, 4.28 miles and 2.34 miles, respectively. The remaining 26 percent would cross open water and unknown.

The agricultural lands and rangelands are used for the same purposes as described above for Segment D.

As Table 3.7-3, *Land Uses Crossed by Each Line Segment*, indicates, in total Segment E would cross 4.77 miles of agricultural lands.

3.7.7.2 Public Lands

Public lands crossed by this segment are under the administration of one state agency, DNR, and four federal agencies, BLM, BOR, USFWS, and USDOE. Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, provides the distance Segment E would cross these public lands (16.29 miles) and Table 3.7-6, *Distance of Public Land Uses Crossed by Project Area*, shows that the predominant land use is rangeland (15.3 miles) and approximately 1 mile of the public lands are agricultural, commercial, industrial and transportation, forest, open water, and unknown.

DNR Lands – Segment E would cross roughly 0.57 mile of DNR lands that are located north of the Wahluke Slope in Grant County. This land is managed for agricultural purposes.

BLM Lands (Saddle Mountain Management Area) – BLM lands that would be crossed by Segment E are the western portion of the Saddle Mountain Management Area. It is managed by BLM for multiple purposes, such as mining, rangeland, recreation, and wildlife habitat.

BOR Lands – The BOR lands crossed by this segment support the same land uses as those described above for Segment D.

USFWS Lands (Columbia National Wildlife Refuge) – Segment E would cross the westernmost part of the Columbia National Wildlife Refuge near Crab Creek. This area is an isolated three quarters of a Section between Crab Creek and the base of the Saddle Mountains. This land is managed for wildlife habitat.

USDOE Lands (Saddle Mountain Unit of the Hanford Reach National Monument and Hanford Site) – A general description of the USDOE lands has been provided above for Segment D.

Segment E, however, would cross through the Saddle Mountain Unit of the Hanford Reach National Monument before crossing the Columbia River and terminating on the Hanford Site.

The Saddle Mountain Unit is managed by the USFWS under an agreement with the USDOE. The area is wildlife habitat that has remained largely undisturbed since the 1940's. It has a land use designation of Preservation and is managed for the preservation of archaeological, cultural, ecological, and natural resources.

This segment ends at the Hanford Substation, which is approximately 1/4 mile from the Columbia River. The area within 1/4 mile of the Columbia River has a land use designation of Preservation; beyond 1/4 mile, the land use designation is Industrial. The area to the northeast of the termination site of this segment is currently used by the USDOE as an operating and facilities area. The remaining surrounding area is open rangeland.

3.7.8 Segment F

Segment F, approximately 32.8 miles, would be located within Grant and Benton Counties and, as shown in Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, would cross privately owned lands (roughly 2.0 percent of the segment) as well as publicly administered lands (roughly 98 percent).

3.7.8.1 Private Lands

All the private land crossed by this segment is open rangeland or rangeland used for raising and grazing of livestock (0.58 miles). No privately owned agricultural areas would be crossed.

3.7.8.2 Public Lands

Public lands crossed by this segment are under the administration of two state agencies, DNR and WDFW, and three federal agencies, BLM, BOR, and USDOE. Table 3.7-2, *Private and Publicly Owned Lands in Project Area*, provides the distance Segment F would cross these public lands (32.19 miles) and Table 3.7-6, *Distance of Public Land Uses Crossed by Project Area*, shows that the predominant land use is rangeland (27.05 miles) and approximately 5.5 miles of the public lands are agricultural, commercial, industrial and transportation, forest, open water, and unknown.

DNR Lands – Segment F would cross DNR lands that are located intermittently along the segment on the north and south side of the Saddle Mountains. These lands are managed for agricultural and rangeland purposes.

WDFW Lands – Roughly 0.8 mile of WDFW administered lands would be crossed by this segment. These lands are managed for rangeland purposes and are typical of the shrub-steppe lands of the area.

BLM Lands (Saddle Mountain Management Area) – The largest amount of public lands that would be crossed by this segment, nearly 40 percent of the total segment, would be the Saddle Mountain Management Area administered by the BLM. Unlike Segments D and E that would cross only the western end of the management area, Segment F would cross east and west through the majority of the area. As a result, nearly all the multiple land uses of the area, such as rangeland, recreation, and wildlife habitat, would be crossed by the segment.

BOR Lands – The BOR lands crossed by this segment support the same land uses as those described above for Segment D.

USDOE Lands (Saddle Mountain Unit of the Hanford Reach National Monument and Hanford Site) – A general description of the USDOE lands has been provided above for Segment D.

The majority of this segment would cross the Saddle Mountain Unit in a different location than Segment E. The land uses along Segment F are different than those for Segment E because Segment F crosses the Wahluke Unit of the Hanford Reach National Monument, which receives year-round recreational use.

Also, since Segment F would cross the Columbia River and terminate at the same location as Segment E, the land uses present on the Hanford Site (south of the Columbia River) would be the same as for Segment E.

3.7.9 Fiber Optic Line

Between the Vantage and Columbia Substations, the fiber would cross private lands (roughly 90%) and public lands (roughly 10%) and would be located in two Washington counties, Grant and Douglas. Table 3.7-8, *Private and Publicly Owned Lands Crossed by the Vantage to the Columbia Fiber Optic Line*, lists the distance of private and public land crossed by the fiber, and identifies the public agencies.

Table 3.7-8
Private and Publicly Owned Lands Crossed by the Vantage to Columbia Fiber Optic Line

Administering Agency	Distance Crossed (mi.)	Percent of Fiber Optic Line
Private	**28.22**	**89.6**
DNR	*0.09*	*0.3*
WDFW	*1.09*	*3.5*
BOR	*2.11*	*6.7*
Total Public	**3.29**	**10.4**
Total	31.51	100%

New table for the FEIS.

A variety of land uses are found on the private and public lands. These land uses are identified in Table 3.7-9, *Land Uses Crossed by the Vantage to Columbia Fiber Optic Line*.

Table 3.7-9
Land Uses Crossed by the Vantage to Columbia Fiber Optic Line

Land Use	Private Lands (mi.)	Public Lands (mi.)	Total
Commercial, Industrial, and Transportation	0.33	0.02	0.35 mi. 1.1%
Residential	0.13	0.00	0.13 mi. 0.4%
Forest	0.02	0.04	0.06 mi. 0.2%
Range	17.94	2.47	20.41 mi. 64.8%
Agricultural	9.78	0.14	9.92 mi. 31.5%
Water	0.02	0.62	0.64 mi. 2.0%
Unknown	0	0	0
Total	**28.22 mi.**	**3.29 mi.**	**31.51 mi.**

New table for the FEIS.

Nearly two-thirds of the land crossed by the Vantage to Columbia fiber optic line is rangeland, approximately 20.4 miles or 65% of the total lands crossed. Agricultural lands are crossed by approximately 9.9 miles or 32% of the total lands crossed. Rangeland and agricultural lands in this area are similar in use to those described for the transmission line segments. Combined, the other land uses along the fiber optic line are located along less than two miles and make up only 3% of the overall land uses crossed.

3.8 Socioeconomics

For Your Information

For socioeconomic considerations the study area is defined as the proposed ROW boundaries of the line segments, as well as nearby adjacent lands.

The only portion of the project that crosses lands within Douglas County is the fiber optic line for roughly 5 miles. No socioeconomic issues would arise and no impacts would occur since the fiber optic line would be installed on existing structures and construction equipment would use existing roads.

The rural character of central Washington is linked to the local socioeconomics. Agriculture is an important industry sector that influences local economies as well as demographic composition. Correspondingly, the booms and busts of agriculture dependent industries are reflected in population and economic growth of the area. Other industries important to the area include service, retail trade, and manufacturing sectors. Kittitas, Grant, Yakima, and Benton Counties, in general, are less racially diverse, have lower per capita and median household incomes, and have a lower percentage of income derived from work earnings than the state.

In Kittitas County, the study area is comprised of rural-agricultural and grazing land uses on private lands and military exercises at the YTC. Segment B is mostly contained within the YTC with a small portion crossing private, undeveloped shrub-steppe lands. Segments that cross Grant County are a mix of developed agricultural and grazing lands, undeveloped private lands, BLM- and DNR-administered lands, and the Saddle Mountain Unit of the Hanford Reach National Monument. Benton County is crossed by segments on the Hanford Site as well as on private lands that are a mix of grazing or undeveloped lands. (See Section 3.7, *Land Use*, for more detail.)

3.8.1 Population

The population within the study area is primarily located in sparsely populated rural areas. In Grant and Kittitas Counties, population densities per square mile are 27.9 and 14.5, respectively, compared to the statewide density of 88.5 per square mile. These densities are representative of the portions of private lands in Grant and Kittitas Counties within the study area and are similarly representative of the private lands crossed in Benton and Yakima Counties. Public lands are predominantly uninhabited in the study area. Over half the population of Grant and Kittitas Counties live in rural areas. Similarly, the study area within Benton and Yakima Counties lies within rural areas, which are considerable distances away from the cities of Yakima, Richland, and Kennewick. No urban areas lie within the study area. Nearby population centers include Ellensburg (estimated population 15,460) and Mattawa (estimated population 2,820). (Data sources include the U.S. Census Bureau, 2000 Census of Population and Housing, Washington, D.C., and the Washington State Office of Financial Management. Population Trends 2001. Olympia, WA).

Data sources for population statistics included in this section include the Washington State Office of Financial Management and the U.S. Census Bureau. Estimates for 2000 statistics are used unless otherwise noted.

Caucasians comprise 86 percent of Benton County, 77 percent of Grant County, 92 percent of Kittitas County, and 66 percent of Yakima County populations. In comparison, the state population is 82 percent Caucasian. A high proportion of people identified themselves as belonging to a race other than White/Caucasian, Black/ African American, Indian/Eskimo/Aleut, Asian, Pacific Islander, or two or more races in the 2000 Census. Four percent of the state population identified themselves as belonging to "Other," whereas the study area population widely differed in their selection of this category: 7 percent in Benton County, 17 percent in Grant County, 2 percent in Kittitas County, and 24 percent in Yakima County. In addition, Native Americans form nearly 5 percent of the Yakima County population as compared to less than 2 percent across the state.

Hispanic origin varies greatly across the area: 13 percent of Benton County, 30 percent of Grant County, 5 percent of Kittitas County, and 36 percent of Yakima County as compared to a statewide composition of 8 percent.

Washington State has experienced steady population growth over the last fifty years, averaging nearly 20 percent increases each decade. Population growth within the study area, however, has not been as stable or positive (Table 3.8-1, *Population Growth for Washington State and Affected Counties, 1950-2000*). The fluctuation in county populations tends to be linked to boom and bust cycles of natural resource dependent economies as well as the policies associated with the Hanford Site in Benton County.

Table 3.8-1
Population Growth for Washington State and Affected Counties, 1950-2000

Year	Washington State		Benton County		Grant County		Kittitas County		Yakima County	
	Pop.	Percent Change	Pop.	Percent Change	Pop.	Percent Change	Pop.	Percent Change	Pop.	Percent Change
1950	2,378,963	–	51,370	–	24,346	–	22,235	–	135,723	–
1960	2,853,214	19.9	62,070	20.8	46,477	90.9	20,467	(8)	145,112	6.9
1970	3,413,244	19.6	67,540	8.8	41,881	(9.9)	25,039	22.3	145,212	0.1
1980	4,132,353	21.1	109,444	62.1	48,522	15.9	24,877	(0.7)	172,508	18.8
1990	4,866,663	17.8	112,560	2.9	54,798	12.9	26,725	7.4	188,823	9.5
2000	5,894,121	21.1	142,475	26.6	74,698	36.3	33,362	24.8	222,581	17.9

Source: Washington State Office of Financial Management, 2002
U.S. Census Bureau's 2000 census
Table has been updated for the FEIS.

3.8.2 Economy

The service, retail trade, manufacturing, and agriculture sectors drive the central Washington economy in the private industry. Employment and income derived from government and government services also plays a major role in the local economies. In Grant and Kittitas counties, government provides 21 percent and 31 percent, respectively, of the local jobs compared to 17 percent at the state level. The value of these government jobs is critical to these counties in terms of the percent of total wage and salary earnings: 29 percent for Grant County and 44 percent for Kittitas County, compared to 17 percent for the state. Benton and Yakima counties have a slightly lesser proportion of government jobs (16 percent and 15 percent, respectively) and a slightly higher proportion of income derived from this sector (18 percent and 20 percent) than the state as a whole.

For Your Information

Data sources for economic statistics include the Washington State Employment Security Department and the U.S. Bureau of Economic Analysis. Estimates for 2000 statistics are used unless otherwise noted.

Per capita incomes in the study area are substantially lower than the $31,230 statewide average: $25,624 for Benton County; $20,111 for Grant County; $21,196 for Kittitas County; and $22,022 for Yakima County. With the exception of Benton County, the lower per capita incomes in this area are evidence of the loss of high-paying jobs and the restructuring of resource-based industries trend throughout the Pacific Northwest since the 1980's. Benton County has a higher reliance on the high wages earned through the utilities sector, primarily those associated with the Hanford Site, to offset resource-based recessions.

Kittitas County has the lowest median household income ($32,546) compared to $34,828 in Yakima County, $35,276 in Grant County, and $47,044 in Benton County. All but one of the study area counties are lower that the state median household income of $45,776 (based on 1999 incomes).

Earnings account for a lesser portion of local residents' income in Grant County (67 percent), Kittitas County (59 percent), and Yakima County (64 percent) than the state (73 percent). Benton County is about the same as the state. Kittitas County residents report a higher income received from dividends, interest and rent (22 percent) compared to the state (18 percent). Benton, Grant, and Yakima counties have lower or similar percentages of this income than the state.

Transfer payments in Benton County (14 percent) are comparable to the state (12 percent). Grant, Kittitas, and Yakima Counties, however, are substantially higher at 20 percent, 17 percent, and 20 percent, respectively. Higher levels of income from transfer payments and dividends, interest and rent in Kittitas County is indicative of a higher proportion of retired and semi-retired population compared to other counties and the state.

Agriculture is an important sector for Grant and Yakima Counties. In Grant and Yakima Counties, agriculture provides one out of four jobs. Wages, though, are relatively less than other industries. Jobs in agriculture account for 17 percent of the wage earnings in Grant County and 14 percent of the wage earnings in Yakima County. Agriculture is less important in Benton County and Kittitas County (4 percent and 5 percent of the total earned wages, respectively).

Unemployment rates within the study area vary dramatically. The average unemployment rate for the state in 2001 was 6.4 percent, which paralleled the 6.5 percent in Benton and Kittitas Counties. Grant County had 10.3 percent and Yakima County had 11.3 percent of its workforce unemployed in 2001. The higher rates are likely associated with the seasonal work periods in the agricultural sector, which is a primary employer in Grant and Yakima counties.

3.8.3 Taxes

The State of Washington relies on a variety of taxes to fund state and local government programs. These taxes include a combined state and local sales and use tax, a business and occupation tax and public utility tax, property tax, and several other ***excise***, real estate, and estate taxes.

For Your Information

The data source for tax information is the Washington State Department of Revenue. Tax rates indicated are for 2001 unless otherwise noted.

Excise taxes *are internal taxes imposed on the production, sale, or consumption of a commodity or the use of a service.*

3.8.3.1 Retail Sales and Use Tax

A combined state and local retail sales tax is collected on the sale of tangible personal property. A use tax is assessed on the value of personal property and services for which a sales tax has not been assessed. The retail sales and use tax applies to most items purchased by consumers, but does not apply to food items or prescription drugs. Utility services and most personal services (e.g., medical, dental, legal) and real estate are not subject to these taxes. However, construction services and building materials are subject to the retail sales tax.

The amount of the retail sales and use tax varies by locality. The state tax base is 6.5 percent, in addition to which each locality can assess 0.5 to 2.1 percent additional tax. Combined state and local tax rates (2002) for the study area range from 7.6 to 8.0 percent.

As a federal agency, BPA is not subject to Washington taxes (Dittrich, 2001). However, contractors performing work for the federal government are required to pay sales or use tax on all materials incorporated into the construction project. Contractors are also required to pay sales or use tax on all consumable supplies and tools used on the project (WAC 458-20-17001).

3.8.3.2 Business and Occupation Tax and Public Utility Tax

Most businesses operating in the state are subject to the business and operation (B&O) tax. However, power, water, and gas companies and carriers by air, water, rail, and motor are taxable under the public utility tax. The B&O tax is typically assessed on the gross income or proceeds of sales or the value for privilege of doing business. Contractors doing construction work for BPA are classified as government contractors for B&O tax purposes. Contractors are subject to the B&O taxes. Typically, the measure of tax is the gross contract price (WAC 458-20-17001).

The public utility tax is typically assessed on the gross operating revenue of public and privately owned public service firms (utilities). Tax rates are based on the classification of business and utility. Utilities in the power business are taxed at a rate of 3.873 percent (Washington State DOR, 2001). The utility tax is levied on the person making the final distribution within the state. If a non-federal entity makes a charge for transmission, that charge is subject to the utility tax. BPA, as a federal agency, is exempt from this tax (Dittrich, 2001).

3.8.3.3 Property Tax

Real and personal property is subject to property tax. Real property includes land and any improvements, such as buildings, attached to the land. The primary characteristic of personal property is mobility. Examples of personal property are machinery, equipment, supplies, and furniture. Personal property tax typically applies to personal property used when conducting business.

The average property tax is a combined state and local tax. The state property tax rate is $3.16 per $1,000 of assessed property value (Washington State DOR, 2001). Local tax rates vary depending on regular and special levies. The state average for local property tax rates is $12.96 per $1,000 assessed value (Washington State DOR, 2001).

BPA acquires land rights (easements) from private property owners for building, operating, and maintaining transmission facilities with the exception of substations, which BPA acquires in fee. The easement rights are for a specific purpose, and the underlying property owner retains ownership of the property. Because the landowner retains ownership, the landowner continues to pay property tax on the entire parcel, including that within any BPA easement. Because BPA is a federal agency, and exempt from paying local property taxes, improvements owned by BPA, such as transmission facilities and any property acquired in fee for substations, would also be exempt.

BPA acquires land grants instead of easements from federal agency land managers. In the study area, federal lands include the Saddle Mountain Unit of the Hanford Reach National Monument, the Yakima Training Center, and the Hanford Site. Because federal land management agencies are also exempt from state and local property tax, no property taxes would be paid for the grants acquired on these federal lands.

3.8.3.4 Other Taxes

Various other taxes are assessed at the state levels, including excise tax on fuels, tobacco products, liquor, timber, rental cars, and others. Other local excise taxes include hotel/motel taxes and municipal business taxes and licenses. The sale of most real property is subject to a real estate tax that is paid by the seller. Other taxes levied by the state or local municipalities include an estate and transfer tax, vehicle licensing fee, and watercraft excise tax. No personal income tax is levied in the state of Washington.

3.8.4 Property Value

Real property is assessed a value by the local county assessor. This property value is referred to as the market value or assessed value, and is defined as the amount of money that a willing buyer would pay a willing seller in an arms length transaction, and neither of whom is under any unusual pressure to buy or sell.

Washington State law (RCW 84.52) requires assessors to appraise property at 100 percent of its true and fair market value in money, according to the highest and best use of the property (Washington State DOR, 1998). Each county assessor values real property using one or more of three professional appraisal methods:

- Market or sales comparison method uses sales to provide estimates of value for similar properties.
- Cost approach method considers what it would cost to replace an existing structure with a similar one that serves the same purpose. The cost method is also used in valuing new construction.
- Income method is used primarily to value business property when the property tends to be worth its income-producing potential (Washington State DOR, 1998).

Property value is used to determine property tax. It is also used as one factor in determining the worth of the property if it is to be sold.

The only exceptions to the information cited above include Washington State law RCW 84.33 and RCW 84.34.

RCW 84.33 addresses the value for Forest land. These values are calculated rather than utilizing the market, cost or income approach to value. The factors affected value include species, stocking percentage, site index, and operability class.

RCW 84.34 addresses the value for Open Space. Two values are considered including the use value and the market value. Taxation is based on the use value, rather than the market value. These properties include agriculture, timber, and open space (a conservation type of category).

For Your Information

Visual resources *are the physical features that make up the visible landscape, including land, water, vegetative, and man-made elements (Guidance Material, USDOT, undated).*

The study area is defined as areas within 5 miles of the line segments that contain residences, recreational areas, public lands, and highways, and have a visual connection to the line segment.

Viewer Characteristics

Low Visual Sensitivity: most motorists, who would see transmission lines at limited locations from roads that they traverse.

Moderate Visual Sensitivity: Some recreationalists, such as bird watchers, hikers and/or recreationalists whose activity is specific to a finite geographic location, who are sensitive to man-made structures and their impact on the view of the natural environment.

High Visual Sensitivity: Residential viewers who own property within 500 ft of the proposed corridors and are concerned about transmission structures and how they impact the view of the natural environment.

Foreground *views are those within 0.25 to 0.5 mile of the viewer.*

3.9 Visual Resources

Typically, ***visual resources*** are more conceptual, esoteric, and open to wider interpretation than other resources. They include the scenery and landscapes that, due to their natural features or relatively undisturbed state, have "outstanding or remarkable value" to the general public. Examples of scenic resources could include outstanding natural features, dramatic vantage points, or pristine landscapes (*Hanford Reach Interim Action Plan, August 28, 1998*).

The study area's visual character and quality are primarily natural and rural, defined by rolling as well as steep and dramatic mountain ranges, consistent stretches of sagebrush and rabbitbrush, and agricultural uses including orchards, vineyards and ranches. Its visual character and quality are also defined by dispersed residential areas, existing transmission and generation facilities, the natural beauty of the Columbia River, and the way topography and vegetation relate to the sky and the changing patterns of light throughout the day and year. All of these factors contribute to the area's visual interest and perceived visual quality.

The visual resources for each segment are described below. Visually Sensitive Viewpoint locations are shown on Map 10, *Visual Analysis,* as well as the location of visual simulations.

3.9.1 Visually Sensitive Viewpoints

Four locations that are visually sensitive have been identified due to their visual quality, uniqueness, cultural significance, or ***viewer characteristics***. These areas include:

- **Viewpoint A**, the area near Colockum Pass, due to the number of residences with **foreground** views of the transmission line project;
- **Viewpoint B**, the north face of the Saddle Mountains near the Columbia River and Crab Creek, due to its unique and striking landform, relationship to adjacent water bodies and number of viewers on Route 243;
- **Viewpoint C**, the Saddle Mountain Ridgeline, due to its striking landform, recreational value, and potential impact from a ridgeline transmission line corridor placement; and
- **Viewpoint D**, the Vernita Bridge and Primitive Boat Launch Area, due to the number of recreationalists and potentially sensitive viewers, and the presence of natural water bodies and dramatic landforms.

3.9.1.1 Viewpoint A, Colockum Pass

Segment A passes close to a number of residences that have expressed concerns about the visual impact of the project. Viewers would mainly be residents and visitors to the cabins nearby.

Photo 3.9-1. Looking northeast and east along Gage Road towards Colockum Road (Viewpoint A)

3.9.1.2 Viewpoint B, North Face of Saddle Mountains

In this area, Segments D, E, and F would cross natural water bodies and scale the north face of this dramatic, natural landform. These three segments would be clearly visible (primarily in the ***middleground***) to many viewers including residents, tourists, and recreationalists traveling through the area.

For Your Information

*The **middleground** is from the foreground to about 5 miles <u>from</u> the viewer.*

***Photo 3.9-1** has been simulated in Chapter 4, Environmental Consequences, to show a new transmission line. See Photo 4.8-2.*

***Photo 3.9-2** has been simulated in Chapter 4, Environmental Consequences, to show a new transmission line. See Photos 4.8-4.*

Photo 3.9-2. Looking east to Saddle Mountains from Highway 243 (Viewpoint B)

3.9.1.3 Viewpoint C, Saddle Mountain Ridgeline

Due to its striking landform and recreational value, the Saddle Mountain Ridgeline along Segment F is considered a visually sensitive resource. The high quality of the visual environment is due to the dramatic landform and proximity to Columbia River and Crab Creek, as well as the number of viewers on SR 243, and the presence of residential and tourist viewers in the area. Viewers would mainly be motorists, residents and tourists.

Photo 3.9-3. Looking northwest towards Saddle Mountain from Wahluke Slope (Viewpoint C)

For Your Information

Photo 3.9-3 *has been simulated in Chapter 4, Environmental Consequences, to show a new transmission line. See Photo 4.8-6.*

3.9.1.4 Viewpoint D, Vernita Bridge

Segment D passes to the west of the heavily used and popular Vernita Bridge and Primitive Boat Launch. Due to the number of motorists and potentially sensitive recreationalist viewers, as well as the presence of natural water bodies and dramatic landforms, this area is considered to be visually sensitive.

3.9.2 Segment A

Segment A parallels the Schultz-Vantage 500-kV line through the Kittitas Valley along the edge of rural, agricultural lands and the base of the Wenatchee Mountains. This area is mostly rolling hills of sagebrush and rabbitbrush. Segment A crosses the gentle slope of the Wenatchee Mountains, the YTC, the Middle Canyon at the base of the Boylston and Saddle Mountains. (See Map 2, *Alternatives*.)

Photo 3.9-4. View from Carlson and Fairview Road looking east

Typical views in this area are generally foreground and middleground views of valley agricultural lands, and rolling hills of sagebrush and rabbitbrush. ***Background*** views are of the Wenatchee, Boylston, and Saddle Mountains and sky.

For Your Information

*The **background** is more than 5 miles from the viewer.*

Viewers would be residents of the low-density, scattered valley homes, dispersed recreationalists, and motorists on Vantage Highway, Highway 90, Colockum, and other rural roads in the area. Approximately 25 residences occur within 500 feet of the line segment. Option 1 of the Sickler-Schultz Reroute would be in the foreground view for one residence. Option 2 would be farther away and have another line between the residence and the new line, but would still be within the foreground view down Wilson Creek.

***Photo 3.9-5** has been simulated in Chapter 4, Environmental Consequences, to show a new transmission line. See Photo 4.8-1.*

Segment A would generally be in the background and adjacent to the existing Schultz-Vantage 500-kV transmission line, or at or near the base of the surrounding mountain ranges.

Photo 3.9-5. View of Schultz-Vantage transmission line crossing of Vantage Highway (View 1 on Map 10)

Photo 3.9-6. Aerial view of Schultz-Vantage Middle Canyon approaching the Columbia River

3.9.3 Segment B

Option B_{NORTH} – Option B_{NORTH} would parallel the existing Schultz-Vantage 500-kV transmission line down Middle Canyon to the Columbia River, passing gently rolling sagebrush and rabbitbrush, steep cliffs, and the Columbia River to the Vantage Substation. (See Map 2, *Alternatives*.) Although numerous lines converge here, the substation is generally out of view due to its location to the east and up-slope from Route 243.

In Middle Canyon, the Schultz-Vantage 500-kV line is typically out of view, but emerges at the east end of the canyon and cuts perpendicular across the Columbia River, becoming visible although not dominating the view for motorists on Route 243. It is part of the foreground with the Columbia River and Wanapum Dam, and middleground with the Columbia River, its adjacent bluffs, the Saddle Mountains, and sky.

Viewers would be motorists on Route 243 and other rural roads in the area; residents of the low-density, scattered homes; dispersed recreationalists; and visitors of the Wanapum Dam.

Photo 3.9-7. Existing Schultz-Vantage transmission line crossing of the Columbia River looking west toward the Saddle Mountains (View 2 on Map 10)

Option B_{SOUTH} – This line option begins as the same alignment as the north end of Segment C, travels south approximately 1 mile, then turns east and runs down Middle Canyon to the Columbia River, where it would parallel the Vantage-Raver line on the south side.

In Middle Canyon, the existing ROW is typically out of view from most viewers except where it emerges at the east end of the canyon and cuts perpendicular across the Columbia River. In this area, it would be visible, yet not dominant in the view, to motorists on Route 243 as part of the foreground with the Columbia River and Wanapum Dam and middleground with the Columbia River, its adjacent bluffs, Saddle Mountains and sky. Recreational users of the John Wayne Trail would also have foreground views of the new line for the first 2 miles, just east of Segment C.

Viewers are motorists on Route 243 and other rural roads in the area, residents of the low density, scattered homes, dispersed recreationalists and visitors of the Wanapum Dam.

3.9.4 Segment C

Segment C would require new ROW across the YTC. The YTC comprises four parallel basaltic ridges, with associated valleys that run northwest to southeast. Topography at the YTC varies from low plains to escarpments, and tends to be more rugged in the eastern portions that drain to the Columbia River. Vegetation is typically dominated by sagebrush and rabbitbrush.

Photo 3.9-8. View from Route 24 looking north towards Yakima Ridge

Segment C would cross steep, rugged terrain of big sagebrush and grassland areas, the crest of the western portion of the Saddle Mountain Ridge, the steep, rugged terrain of the four parallel basaltic ridges, the Yakima Ridge, rolling terrain of sagebrush and grasslands, and orchards and vineyards. (See Map 2, *Alternatives*.)

Photo 3.9-9. Aerial view of eastern edge of Yakima Training Center looking South

Segment C would be remote from most potential viewers, although tribal users and dispersed recreationalists are sometimes permitted into areas of the YTC. Segment C could potentially be visible as it crosses Yakima Ridge in the background from SR 243, but would not be dominant in the view. At the southern end of this segment, the proposed route would become visible to motorists for a short distance as it crosses SR-24 on its way to the new Wautoma Substation.

3.9.5 Segment D

Segment D would parallel or replace the existing Vantage-Midway 230-kV line from the Vantage Substation up and over the Saddle Mountains, down through rolling range land, across heavily used agricultural areas on the Wahluke Slope, through the western corner of the Saddle Mountain Unit of the Hanford Reach National Monument, and over the Columbia River to the Midway Substation. South of the Midway Substation, it would parallel the existing Big Eddy - Midway 230-kV line up the steep slope of the Umtanum Ridge, across rolling sagebrush, grassland and agricultural areas, and up and over the Yakima Ridge to the proposed Wautoma Substation. (See Map 2, *Alternatives*.)

Due to the length of Segment D and the diversity of terrain and viewers, smaller portions of the segment are discussed in more detail below.

3.9.5.1 Wanapum Dam/Vantage Substation to Crab Creek

This area generally consists of foreground and middleground views of sagebrush, grasslands, orchards, transmission lines, and the Columbia River and background views of the surrounding mountains and sky. Viewers would be the few residents of Beverly and Schwana, motorists on Highway 243, some dispersed recreationalists who use the Columbia River and adjacent areas, and dedicated recreationalists at the Wanapum Dam. Four residences are within 500 feet of the proposed ROW.

Photo 3.9-10. View of Vantage-Hanford transmission line from Vantage Substation looking south towards the Saddle Mountains

3.9.5.2 North Face of Saddle Mountains

The north face of the Saddle Mountains consists of foreground and middleground views of the steep, rocky, dry, slopes of the Saddle Mountains, Crab Creek, and adjacent Columbia River, with background views of the sky and distant views through the pass. Viewers would be motorists on Route 243, the few residents of Beverly and Schwana, some dispersed recreationalists who use the Columbia River, Crab Creek Wildlife Area, Milwaukee Road Corridor and the Saddle Mountains, and tourists at the Wanapum Dam.

Photo 3.9-11. Aerial view of agricultural areas and existing transmission line east of Mattawa looking north to Saddle Mountains

3.9.5.3 Wahluke Slope

This area consists of foreground and middleground views of agricultural lands and transmission lines, and background views of the surrounding mountain ranges and sky. Viewers would be agricultural workers, a few residents, dispersed recreationalists, and local motorists.

3.9.5.4 Bluff Above Highway 243 to Midway Substation

This area consists of foreground views of the Columbia River and sagebrush areas, middleground views of sagebrush, the adjacent bluff and the Hanford Site facilities, and background views of the sky. Viewers would be motorists on Route 243 and some dispersed recreationalists, such as boaters on the Columbia River.

3.9.5.5 Midway Substation to the New Wautoma Substation

Typical views in this area consist of foreground and middleground views of sagebrush, grasslands, and agriculture, and background views of mountains and sky. The Big Eddy-Midway transmission line is generally not the dominant view. It crosses open sagebrush and agricultural areas, and is only visible from a short section of Route 24. Viewers would be motorists on Route 24 and local agricultural workers.

Photo 3.9-12. Aerial view of valley between Umtanum and Yakima Ridge Big Eddy-Midway transmission line

Photo 3.9-13. View looking southeast from Route 24 towards the Saddle Mountains Unit at Vantage-Hanford transmission line crossing

3.9.6 Segment E

Segment E would parallel the existing Vantage-Hanford 500-kV transmission south from the Vantage Substation, near the Wanapum Dam, cross over the Saddle Mountains, down rolling range land, across heavily used agricultural areas on the Wahluke Slope, through the middle of the Saddle Mountain Unit of the Hanford Reach National Monument, and over the Columbia River to the Hanford Substation.

Photo 3.9-14. Existing view of No Wake Lake near Crab Creek looking south toward Vantage-Hanford

3.9.6.1 Wanapum Dam/Vantage Substation to Crab Creek

Segment E would travel south for 4 miles across gently sloping terrain of sagebrush and grasslands, several orchards and open water areas with associated wetlands. A few residences are located near Beverly and Schwana to the west. Highway 243 runs parallel and west of the proposed route.

Typical views in this area consist of foreground views of sagebrush and grasslands, middleground views of sagebrush, grasslands, orchards and the Columbia River, and background views of the surrounding mountains. Viewers would be the few residents of the area, motorists on Highway 243, and dispersed recreationalists. One residence is located within 500 feet of the proposed route.

3.9.6.2 North Face of Saddle Mountains

Segment E would cross a very steep, rocky, dry, north-facing slope at the western edge of a naturally formed cut in the Saddle Mountain Ridge that runs east/west. The existing Vantage-Hanford 500-kV line scales this rocky slope. The cut in the Saddle Mountain Ridge is formed by the Columbia River and possesses good scenic qualities. Typical views in this area generally are foreground and middleground views of the steep, rocky, dry slopes and adjacent Columbia River, and background views of the sky and distant views through the pass. Viewers would be the few residents, motorists on Route 243, dispersed recreationalists, and dedicated recreationalists at the Wanapum Dam.

3.9.6.3 Wahluke Slope

At the top of the Saddle Mountains, Segment E would travel south across the rugged terrain of big sagebrush and grassland areas into heavily agricultural areas, orchards, vineyards and local roads that stretch across the Wahluke Slope to the southeast and end at Highway 24 at the edge of the Saddle Mountain Unit of the Hanford Reach National Monument. Typical views in this area generally are foreground and middleground views of agricultural uses, and background views of the surrounding mountain ranges and sky. Viewers would be agricultural workers, a few residents, dispersed recreationalists, and local motorists.

Photo 3.9-15. View looking northeast from 24 SW near L Street SW

3.9.6.4 Saddle Mountain Unit of the Hanford Reach National Monument

Segment E would cross sagebrush areas that transition to grasslands near the Columbia River. The existing Vantage-Hanford transmission line is generally not the dominant view. Typical views in this area consist of foreground and middleground views of adjacent sagebrush and agricultural lands and background views of the sky. Viewers would include motorists on Route 24.

3.9.6.5 Columbia River Crossing to Hanford Substation

From the Columbia River to the Hanford Substation, Segment E crosses grass and sedge with some small willows near the river's edge and open water to the heavily disturbed landscape at the Hanford Substation. Typical views in this area consist of foreground and middleground views of the Columbia River, sagebrush, and Hanford Site facilities and background views of the horizon and sky. Viewers would be workers at the Hanford Site and dispersed recreationalists (boaters) on the Columbia River.

3.9.7 Segment F

Segment F runs east from the Vantage Substation, south up to the top of the Saddle Mountains, and then parallels the ridgeline until it reaches the existing Grand Coulee-Hanford 500-kV transmission line, where it crosses rolling rangeland at the edge of heavily used agricultural areas on the Wahluke Slope, the Saddle Mountain Unit of the Hanford Reach National Monument, and the Columbia River to the Hanford Substation. (See Map 10, *Visual Analysis*.)

3.9.7.1 Vantage Substation to Crab Creek

From the Vantage Substation to Crab Creek, Segment F (a new corridor) would cross gently sloping terrain of sagebrush and grasslands, several orchards and open water areas with associated wetlands. There are a few residences near Beverly and Schwana to the west. Highway 243 runs parallel and west of the proposed route. Typical views consist of foreground views of sagebrush and grasslands, middleground views of sagebrush, grasslands, orchards and the Columbia River, and background views of the surrounding mountains. Viewers would include the few residents, motorists on Highway 243, and dispersed recreationalists.

Photo 3.9-16. View of area near Vantage Substation

3.9.7.2 North Face of Saddle Mountains

Segment F would cross a very steep, rocky, dry, north-facing slope at the western edge of a naturally formed cut in the Saddle Mountain Ridge. Although existing transmission lines scale this rocky ridge to the west, Segment F would create a new corridor on a relatively undisturbed mountain face. Typical views consist of foreground and middleground views of the steep, rocky, dry slopes, Crab Creek and adjacent Columbia River, and background views of the sky. Viewers would include the few residents, motorists on Route 243, and dispersed recreationalists.

Photo 3.9-17. The north face of the Saddle Mountains (View 3 on Map 10)

For Your Information

Photo 3.9-17 *has been simulated in Chapter 4, Environmental Consequences, to show a new transmission line.* *See Photo 4.8-5.*

3.9.7.3 Saddle Mountain Ridge

Segment F would create a new corridor across rolling and steep big sagebrush areas on the south side of the Saddle Mountains, parallel to the ridgeline. Typical views consist of foreground and middleground views of sagebrush, and background views of the Saddle Mountains and sky. Viewers would include local motorists, the few residents, Wahluke Slope agricultural area workers, and dispersed recreational users of the Saddle Mountains.

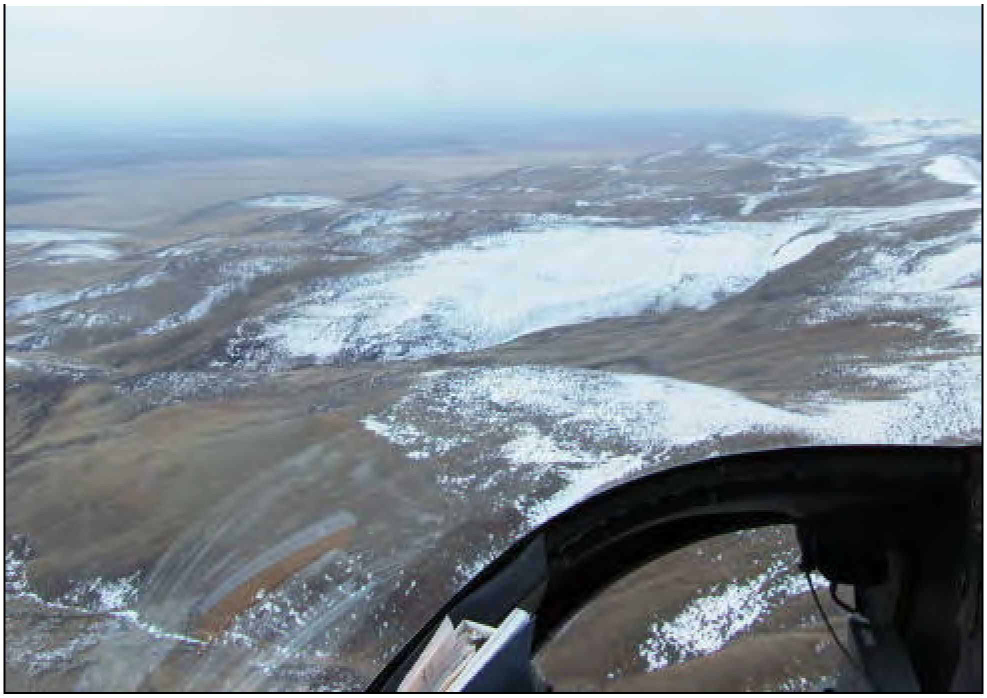

Photo 3.9-18. Aerial view of the south slope of the Saddle Mountain Ridge looking southwest towards Mattawa

3.9.7.4 Wahluke Slope

Segment F would parallel the existing Grand Coulee-Hanford transmission line and be only visible for a short distance for most viewers. Typical views consist of foreground views and middleground views of agricultural uses and sagebrush and background views of the Saddle Mountains and sky. Viewers are motorists on Highway 24 and the few local roads, and dispersed recreationalist users of the Saddle Mountain Unit of the Hanford Reach National Monument.

For Your Information

Photo 3.9-19 *has been simulated in Chapter 4, Environmental Consequences, to show a new transmission line. See Photo 4.8-7.*

Photo 3.9-19. View of Grand Coulee–Hanford line looking north near Highway 24 (View 4 on Map 10)

Photo 3.9-20. View looking south from top of bluff overlooking the Saddle Mountains Unit of the Hanford Reach National Monument adjacent to Grand Coulee–Hanford line

3.9.7.5 Hanford Reach National Monument/Hanford Site

Segment F crosses big sagebrush, descends a 200 foot bluff to a flat area where the landscape transitions to grasslands/sedge/ small willows near the Columbia River, crosses over the Columbia River and ends at the Hanford Substation. Typical views consist of foreground and middleground views of the grasslands and background views of distant mountains and sky. The transmission line would only be visible for short distances. Viewers would include motorists on Route 24, workers at the Hanford Site, and dispersed recreational users (boaters) on the Columbia River.

3.9.8 Fiber Optic Line

North of the Vantage Substation, the fiber optic line would pass through an area of wetlands and sagebrush, over agricultural areas and sagebrush of the Frenchman Hills, across the lakes and exposed rock channels of Quincy Lakes Wildlife Area, then angles northwest across the agricultural and sagebrush lands between Lynch Coulee and Moses Coulee where it terminates at the Columbia Substation. Typical views consist of foreground and middle ground views of shrub-steppe and channeled scablands or circle crops and orchards and background views of low hills and distant mountains and sky. Viewers would include motorists on Interstate 90 and rural roads to the north and State Highway 28, recreational users at Quincy Lakes Wildlife Area, and workers in the orchards and farmlands.

3.10 Recreational Resources

This section describes recreation activities within 1 mile of the line segments. The activities described occur both under and near the existing and proposed transmission lines. In many cases, these activities have not been formalized, permitted, or sanctioned by the landowner or easement holder. Recreational activities within the study area may be dispersed or dedicated and include such activities as hunting, off-road and all-terrain vehicle use, boating, fishing, hiking, rock hounding, horseback riding, camping, snowshoeing, ice skating, and snowmobiling. Recreationalists are predominantly full-time residents (White, 2001).

Table 3.10-1, *Recreational Resources*, lists recreation sites and categorizes activities as either ***dispersed*** or ***dedicated*** recreation. Map 7, *Land Ownership*, illustrates the proximity of recreation sites to the segments.

For Your Information

Dispersed Recreation *refers to recreational activities that are not limited to a finite location. These types of activities do not require improvements that commit resources to a particular type of recreation.*

Dedicated Recreation *refers to activities that are limited to a finite geographic location and are supported by improvements that commit the resource to a specific recreational activity.*

3.10.1 John Wayne Trail

Following the abandoned Chicago Milwaukie St. Paul and Pacific railroad, the John Wayne Trail runs from the west slopes of the Cascade Mountains to the border with Idaho. The 110-mile portion of the trail from near North Bend, Washington to the Columbia River near Vantage, Washington, is managed as the Iron Horse State Park (Washington State Parks, 2002). From the east side of the Columbia River near Beverly, Washington, to the border with Idaho, the trail is referred to as the Milwaukee Road Corridor (Lance Elliott, 2002). Recreational activities along the trail include hiking, mountain biking, camping, horseback riding, wildlife viewing, cross-country skiing, dog sledding, and snowshoeing.

3.10.2 Yakima Training Center

Recreational activities on the YTC depend on the season and geographic location. Near the north boundary of the site is a 22-mile segment of the John Wayne Trail. This 22-mile segment of the trail is part of the 110-mile Iron Horse State Park. Non-vehicular activities such as hiking, wildlife viewing, mountain biking, cross-country skiing, and horseback riding are permitted along the trail within the YTC. Camping is permitted in two locations, at the Kittitas and Doris trailheads located at the west and east ends of the 22-mile segment. Motor vehicle use, carrying a loaded firearm, or shooting from or across the trail is not permitted. On the YTC, the John Wayne Trail is open daily from dawn to dusk, but sections of the trail may be temporarily closed for safety purposes. Trail users must sign in and out in person daily at the YTC Operations Center.

Other dispersed recreation allowed on the YTC includes hunting, falconry, horseback riding, and mountain biking as well as organized activities such as field dog training and trials, horse endurance rides, and wildlife viewing. Hunting continues throughout the year and is the most popular recreational activity. Falconry also continues throughout the year and is a permitted use throughout most of the YTC. Horseback riding is limited to existing roads and trails, and may be restricted seasonally according to wildlife needs. Mountain biking is allowed on designated roads and in the John Wayne Trail corridor. Field dog training and trials are permitted September through January. Horse endurance rides typically occur during the late spring and early fall. Wildlife viewing of the Western Sage grouse occurs only once a year.

Table 3.10-1
Recreational Resources

Line Segment	Resource	Dispersed Recreational Activities	Dedicated Recreational Activities
A	Open Range	Hunting, off-road vehicles, fishing, hiking, rock hounding, horseback riding, primitive camping, snowshoeing, snowmobiling	
A	Charlton Canyon Schnebly Canyon and Creek Cooke Creek Burnt Canyon Cave Canyon Trail Gulch Parke Creek Trail Creek	Hunting, off-road vehicles, fishing, hiking, rock hounding, horseback riding, primitive camping, snowshoeing, snowmobiling	
B$_{NORTH}$, B$_{SOUTH}$, C	YTC ***All activities on the site area subject to geographic and seasonal restrictions.***	Hunting, falconry, horseback riding, wildlife viewing, field dog training, mountain biking	John Wayne Trail / Iron Horse State Park (hiking, mountain biking, camping, horseback riding, wildlife viewing, cross-country skiing, dog sledding, and snowshoeing)
B$_{NORTH}$, B$_{SOUTH}$, D, E, F	Columbia River	Sightseeing, wildlife viewing, off-road vehicles, fishing, hiking, boating, water sports	
D	Wanapum Dam		Heritage Center tours and activities, Power house tours

Line Segment	Resource	Dispersed Recreational Activities	Dedicated Recreational Activities
D, E, F	John Wayne Trail / Milwaukee Road Corridor		John Wayne Trail / Iron Horse State Park (hiking, mountain biking, camping, horseback riding, wildlife viewing, cross-country skiing, dog sledding, and snowshoeing)
D, E, F	Crab Creek Wildlife Area	Hunting, fishing, wildlife viewing	
D, E, F	Milwaukee Road Corridor	Hiking, mountain biking, horseback riding, primitive camping	
D, E, F	Saddle Mountains (includes BLM-managed areas)	Hunting, off-road vehicles, rock hounding, hand gliding, paragliding, horseback riding, hiking, camping, falconry, mountain biking, bird watching	
D, E, F	Hanford Reach of the Columbia River	Boating, fishing	***No landing on Hanford Site allowed***
D, E, F	Hanford Reach National Monument	Wildlife observation, hiking, photography, fishing, hunting, environmental education, sightseeing	
F	Wahluke Unit of the Hanford Reach National Monument	Wildlife observation, hiking, photography, fishing, hunting, environmental education, sightseeing	Improved roads, boat launches, parking areas
Fiber Optic Line Vantage to Columbia	Quincy Unit of the North Columbia River State Wildlife Recreation Area including: • Quincy Wildlife Area, • Stan Coffin Lake, • Quincy Lake, • Burke Lake, • Evergreen Lake, • Cabin Lake, and • Hilltop Lake are south of the Quincy Unit.	Boating, fishing, wildlife observation, hunting	Boat launches, parking, camping, picnicking
Fiber Optic Line Vantage to Midway and Midway to Wautoma	Similar to those along Segment D	Similar to those along Segment D	Similar to those along Segment D

Sources: Neil White, personal communication
Billie Sumrall, personal communication
Wanapum Dam Heritage Center website
James Munrone, personal communication
BLM, 1997
CH2M HILL, 1998
U.S. Department of the Army, 1996

Table has been updated for the FEIS.

3.10.3 Columbia River near Vantage

Dispersed recreational activities near the Columbia River include sightseeing, wildlife viewing, off-road vehicle use, fishing, hiking, boating, and water sports. Interpretive facilities are provided at the Wanapum Dam as part of the Native American Heritage Center and at the Dam Powerhouse and are considered dedicated recreational activities.

On the east side of the Columbia River near Vantage, the John Wayne Trail is called the Milwaukee Road Corridor. The trail follows the abandoned Chicago Milwaukee St. Paul and Pacific railroad line for the majority of its length. At a few locations, the trail departs from the abandoned railroad corridor because of private ownership. Recreational use of the trail requires a permit from the DNR. Along the trail, recreation is dispersed and includes hiking, mountain biking, horseback riding, and primitive camping. Within the Crab Creek Wildlife Area, dispersed recreation focuses on the pristine natural environment and includes fishing, hunting, and wildlife viewing.

3.10.4 Saddle Mountains

The portion of the Saddle Mountain Management Area that is managed by the BLM is remote and far from major transportation corridors, so sightseeing is limited. However, other dispersed recreation activities occur in the area. Hang gliders come to this area from all over the state for the updrafts along the north slope of the range. This area has an even greater geographical pull for rock hounding, with visitors from as far north as British Columbia, the Oregon Coast and other areas within the U.S. Because there are over 80 miles of roads and trails on public lands (most were constructed to access power transmission lines), mountain biking opportunities are also available. Overall, recreational opportunities within this area draw a wide range of both local and regional recreation user groups (BLM, 1997).

3.10.5 Hanford Reach National Monument

The Hanford Reach of the Columbia River was found suitable for inclusion in the National Wild and Scenic Rivers system under "Recreational River" classification in the National Park Service's Hanford Reach of the Columbia River Comprehensive Conservation Study/EIS in June 1994. The Hanford Reach is currently under interim protection as directed by Public Law 100-605, as amended by Section 404 (Hanford Reach Preservation) of Public Law 104-333. The USFWS is responsible for overseeing interim management protection.

The Hanford Reach boasts some of the best salmon fishing in the entire Columbia River watershed. Anglers travel great distances to fish these waters during peak fishing season. The Hanford Reach also offers dispersed water-related recreation including boating and fishing; however, no landing on the Hanford Site is allowed.

Recreation in the Hanford Reach National Monument is dispersed and dedicated. Activities include boating, sightseeing, hunting, hiking, wildlife observation, photography, fishing, and environmental education. However, the area lacks interpretive and service facilities typical of a national monument.

The Saddle Mountain Unit is situated on the north side of the Columbia River. Public access to this area is currently limited to permitted research and environmental education activities only.

The Wahluke Unit, located north and east of the Saddle Mountain Unit, provides 57,000 acres of recreational opportunities in the Hanford Reach National Monument. Popular recreation pursuits include sightseeing, hiking, photography, bird watching, hunting, fishing, and environmental education. Current visitor use facilities consist of directional signing, improved roads, boat launches, and parking areas.

3.10.6 Quincy Unit of the North Columbia River State Wildlife Recreation Area

The Quincy Unit of the North Columbia River State Wildlife Reservation Area is less than 10 miles south/southwest of Quincy, Washington, and roughly 5 miles northwest of George, Washington. This unit consists of the Quincy Wildlife Area as well as a series of lakes (Stan Coffin, Quincy, Burke, and Evergreen) that provide numerous recreational opportunities such as boating, fishing, wildlife viewing, and hunting. Facilities vary at the different lakes, but generally include boat launches, picnic tables, toilets, parking areas, and areas for camping.

For Your Information

Cultural resources *are historic and archaeological resources, resources of traditional and cultural significance, sacred sites, Native American human remains and associated objects, and cultural landscapes.* ***Historic properties*** *are those resources identified above which are entitled to special consideration under federal statute, regulations, and/or executive orders.*

The ***Area of Potential Effect (APE)*** *for this project is defined as the entire ROW for the length of the proposed transmission line, access roads, and fiber optic line.*

Lithic *relates to stone.*

A ***traditional cultural property (TCP)*** *is an area that is associated with cultural practices or beliefs of a community. It is rooted in the community's history and is important in maintaining cultural identity.*

3.11 Cultural Resources and Historic Properties

Cultural resources and historic properties located within close proximity of the project's ***Area of Potential Effect (APE)*** include prehistoric camps and villages, prehistoric burial grounds, prehistoric caves, archaeological districts, ***lithic*** scatters, prehistoric stone tool quarries, historic homesteads, historic railroad sites, historic refuse scatters, traditional fishing locations, and traditional root-gathering areas.

The following sections summarize the results of a literature review (Hartzell, Hicks, and Tromly, 2002) conducted for all of the alternatives and a pedestrian survey conducted for the Preferred Alternative (Griffin and Churchill, 2002). A traditional cultural properties (TCPs) study is being performed to augment the literature review and the cultural resource survey.

3.11.1 Cultural Setting

The Columbia, Kittitas, Wanapam, Wenatchee, and Yakama peoples lived in the vicinity of the study area at the time of the Lewis and Clark expedition of the Snake and Columbia Rivers in 1805 en route to the Pacific (Ray, 1936). These people were Echeesh-Keen (also referred to as Sahaptan) and Salish speakers, part of what would later be described as the Plateau culture. Their life was focused on an annual round anchored by specific times for gathering, hunting, fishing, and trading, but also for religious activities, visiting, courting, storytelling, dancing, and other such activities.

A period of exploration and trapping followed, with early travelers such as Wilson P. Hunt of the Astor Company, David Thompson of the Northwest Company, Alexander Ross, Ross Cox, and many others arriving in this area between 1805 and 1815. The Hudson's Bay Company opened Fort Nez Perces in the 1820's, which was later called Old Fort Walla Walla in the 1830's.

Gold mining brought many Europeans, Euroamericans, and Chinese through the study area beginning around 1850, but it was ranching that kept them there. The area's grass provided sustenance for cattle and their owners alike (Splawn, 1917). Transportation – particularly river crossings – provided the means for expansion. The Columbia River, the Caribou Trail, wagon roads, and later the railroads, all served to bring travelers and supplies to this area, providing residents with the opportunity to serve as merchants. Camels were even used for several years to bring gold mining supplies from this area to Idaho and Montana (Lewis, 1928).

Horse ranching and fruit farming increased in the latter half of the last century, but it was not until more efficient irrigation systems were organized around the turn of the century that fruit farming really became a major activity in this region.

The world's first dual-purpose nuclear reactor (the N-Reactor) was built on the Hanford Site in 1963-1969 (Rice 1983). Some of the Hanford Site structures are now old enough to be considered historic sites.

3.11.2 Cultural Resource and Historic Property Types

Cultural resources are categorized as historic and archaeological resources, resources of traditional and cultural significance, sacred sites, and cultural landscapes. Historic properties are those resources above which are all recognized and protected under federal mandates.

For Your Information

Debitage *are the flaking by-products that result from working rough stone into tools.*

Archaeological lithic scatters produced during stone tool manufacture or modification are the most common archaeological site type in the project area. Flaked tools and ***debitage*** are overwhelmingly the most common cultural material present at these sites, although ground, pecked, and battered stone tools also are found. Campsites, which include a number of material types and features and which represent longer-term use and multiple activities, make up the second most common site type. Other common archaeological site types include resource procurement and processing activities, such as quarries, butchering sites and root gathering areas.

Historic sites recorded in this area include historic homesteads, dumps, trails, railroad-related features and earthen structures. These sites include both historic structures and artifact scatters.

3.11.3 Draft EIS Literature Review

In a cooperative effort to protect known cultural resources and historic properties, specific information is not detailed in the EIS; however, results of the literature review and field survey are summarized. BPA is working directly with Native American tribes and other cultural resource preservation agencies to accurately describe, identify locations of, and minimize adverse effects to cultural resources (where possible) and historic properties that would result from the proposed project.

A literature review was conducted for all of the alternatives and was summarized in the draft EIS. This review was performed by the Confederated Tribes of the Colville Reservation under contract to the BPA and included a literature and archival search at the Washington State Office of Archaeology and Historic Preservation; a search of library and archival materials at the University of Washington; and queries of national databases such as the National Park Service's National Archaeological Database (Maps and Reports), the National Register of Historic Places (NRHP), and the National Native American Graves Protection and Repatriation Act (NAGPRA) Consultation Database.

The results of the literature review identified currently recorded sites and unsurveyed areas that have a high probability for yielding significant cultural resources and historic properties. These sites and areas were collectively referred to as "sensitive areas." Table 3.11-1, *Summary of Sensitive Areas by Alternatives*, summarizes the number of sensitive areas by alternative. This table shows only the sensitive areas that are known through literature searches, which are dependent on other surveys that may have been previously conducted in the area. The actual presence or absence of cultural resources and historic properties along the Preferred Alternative would be determined through subsequent field surveys.

Table 3.11-1
Summary of Sensitive Areas by Alternative

Alternative	Number of Sensitive Areas	Total Area
Preferred 2	36	7.2 mi^2
1*	36	7.4 mi^2
3	38	8.0 mi^2
1A*	38	7.8 mi^2
No Action Alternative	No new or additional areas	--

*B_{SOUTH} would increase the number of known sensitive areas by 2 for Alternatives 1, and 1A. The total area would increase by 0.3 mi^2 for the same alternatives.
This table was in Chapter 4 of the DEIS.

For Your Information

All unsurveyed areas that have denied BPA access would be surveyed after BPA purchases the easements for the new line. These surveys would be completed before construction is begun.

3.11.4 Survey Results for the Preferred Alternative (Alternative 2)

A pedestrian survey was conducted for the entire length of the Preferred Alternative (except for four small areas where access was denied to archaeologists by private landowners), access roads, and fiber optic route. The survey included a surface reconnaissance of the proposed transmission line ROW and fiber optic route using parallel transects spaced not more than 15 m apart and of the access roads using parallel transects spaced not more than 10 m apart. This survey was conducted by Archaeological Frontiers under contract to the Yakama Indian Nation and BPA.

3.11.4.1 Right-of-Way

Table 3.11-2, *Cultural Resources and Historic Properties Located Along the Preferred Alternative Right-of-Way*, summarizes the number of newly identified cultural resources and historic properties by type that were identified from the pedestrian survey along the right-of-way. "Newly identified" refers to cultural resources and historic properties that were not previously recorded or identified in the literature review as sensitive areas.

Table 3.11-2
Cultural Resources and Historic Properties Located Along the Preferred Alternative Right-of-Way

Type of Artifact(s)	Total Number Located by Area*		
	Sites	Resources	Isolated Finds
Newly Identified			
Prehistoric	20 (20)	6 (6)	21 (1)
Historic	7 (3)	--	2 (0)
Previously Identified			
Prehistoric	6 (6)	--	--
Historic	3 (2)	--	--

*The number of sites, resources, and isolated finds that are eligible or potentially eligible for listing to the NRHP are indicated within the parentheses.
New table for the FEIS.

For Your Information

Sites are any location having a concentration of three or more artifacts within 100 m of each other or a cultural feature; Resources are areas having two artifacts; and Isolated Finds are areas with one artifact.

All prehistoric archaeological sites have the potential to provide significant information on changes in land use practices over time and past environmental conditions of an area that may have direct bearing on past human activity. It is for this reason that all prehistoric sites and resources (26) within the Preferred Alternative are considered potentially significant and eligible to the NRHP.

All but one of the prehistoric isolated finds is considered ineligible to the NRHP. One isolated find is considered potentially significant.

Of the total historic sites, resources and isolated finds (9), three sites have the potential to yield significant information on the life ways and early land use practices of Native- and Euro-Americans that use the project area. It is for this reason that these sites are considered potentially significant and eligible to the NRHP. The remaining four historic sites and two isolated finds lack sufficient information to meet the NRHP criteria and are considered insignificant to the NRHP.

In addition to the newly identified prehistoric and historic resources, attempts were made to relocate 15 previously recorded cultural resource sites located in proximity to the Preferred Alternative's APE. Nine of the 15 earlier recorded sites were found to lie within the APE; however, only seven (five are prehistoric and two are historic) were located again during the pedestrian survey. The remaining two sites (one prehistoric and one historic) may have been mislocated on their original site forms or hidden from view by ground cover.

Each of the seven previously recorded sites that were located again is considered potentially significant to the NRHP. Of the two sites that could not be relocated, the prehistoric site is also considered potentially significant.

3.11.4.2 Access Roads and Fiber Optic Route

Twenty-six prehistoric resources and one paleontological site were newly identified along Preferred Alternative's access roads and the fiber optic route. Table 3.11-3, *Cultural Resources and Historic Properties Located Along the Preferred Alternative Access Roads and Fiber Optic Route*, summarizes the number of cultural resources that were identified from the pedestrian survey along the access roads and fiber optic route.

Table 3.11-3
Cultural Resources and Historic Properties Located Along the Preferred Alternative Access Roads and Fiber Optic Route

Type of Artifact(s)	Total Number Located by Area*		
	Sites	Resources	Isolated Finds
Newly Identified			
Prehistoric	16 (15)	3 (1)	7 (0)
Paleontological	1 (1)	--	--
Previously Identified			
Prehistoric	11 (10)	1 (1)	--

*The number of sites, resources, and isolated finds that are eligible or potentially eligible for listing to the NRHP are indicated within the parentheses.
New table for the FEIS.

Sixteen of the newly identified prehistoric resources (15 sites and 1 resource) and 11 of the earlier identified prehistoric resources (10 sites and 1 resource) are considered to be potentially significant and eligible for inclusion to the NRHP due to their potential to yield significant information pertaining to the prehistoric land use of the area. The remaining two sites, two resources, and seven isolated finds are considered insignificant to the NRHP due to the lack of potential to contribute information important to regional prehistory.

No newly or previously identified historic artifacts were located along the access roads or fiber optic route.

3.12 Public Health and Safety

Transmission facilities provide electricity for heating, lighting, and other services essential for public health and safety. These same facilities can potentially harm humans. Contact with transmission lines can injure people and damage aircraft. This section describes public health and safety concerns, such as shocks and noise, related to transmission facilities. More detailed information can be found in Appendix I, *Electrical Effects*.

3.12.1 Electric and Magnetic Fields

Transmission lines, like all electrical devices and equipment, produce ***electric and magnetic fields*** (EMF). The voltage, or force that drives the ***current***, is the source of the electric field. Electric fields are expressed in units of volts per meter (V/m) or kilovolts per meter (kV/m). The current, or movement of electrons in a wire, produces the magnetic field. The strength of magnetic field depends on the current, design of the line, and the distance from the line. Field strength decreases rapidly with distance. Electric fields can be reduced significantly by the presence of conducting objects. Thus, inside houses and automobiles, electric fields are lower than outside because of shielding.

For Your Information

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

Current *is the amount of electrical charge flowing through a conductor.*

Electric and magnetic fields are found around any electrical wiring, including household wiring and electrical appliances and equipment. Throughout a home, the electric field strength from wiring and appliances is typically less than 0.01-kV/m. However, fields of 0.1-kV/m and higher can be found very close to some electrical appliances.

Average magnetic field strength in most homes (away from electrical appliances and home wiring, etc.) is typically less than 2 ***milligauss (mG)***. Very close to appliances carrying high current, fields of tens of hundreds of milligauss can be present. Unlike electric fields, magnetic fields from outside power lines are not reduced in strength by trees and building material. Because of this, transmission lines can be a major source of magnetic field exposure throughout a home located close to the line. Typical electric and magnetic field strengths for some BPA transmission lines are given in Table 3.12-1, *Typical Electric and Magnetic Field Strengths*.

A ***milligauss*** *is one thousandth of a gauss.*

A ***gauss*** *is a unit of magnetic induction.*

kV/m = kilovolt per meter
mG = milligauss

Table 3.12-1
Typical Electric and Magnetic Field Strengths

Transmission Lines	Electric Fields (kV/m)	Magnetic Fields (mG) Maximum[1]	Magnetic Fields (mG) Average[2]
115-kV			
Maximum on ROW	1	62	30
Edge of ROW	0.5	14	7
200 feet from center	0.01	1	0.4
230-kV			
Maximum on ROW	2	118	58
Edge of ROW	1.5	40	20
200 feet from center	0.05	4	2
500-kV			
Maximum on ROW	7	183	87
Edge of ROW	3	62	30
200 feet from center	0.3	7	3

[1] Under annual peak load conditions (occurs less than 1 percent of the time)

[2] Under annual average loading conditions

Note: The information above was obtained from a BPA study to characterize nearly 400 transmission lines located in the Pacific Northwest. Based on 1992 data (Sterns¸ et al.).

There are currently no national standards in the United States for electric and magnetic fields from transmission lines. Some states have established electric and/or magnetic field standards for 60-Hz electric and magnetic fields. The state of Washington does not have limits for either electric or magnetic fields from transmission lines. The BPA has maximum allowable electric fields of 9-kV/m on the ROW and 5-kV/m at the edge of the ROW. The BPA also has maximum allowable electric field strengths of 5-kV/m, 3.5-kV/m, and 2.5-kV/m for road crossings, shopping center parking lots, and commercial/industrial parking lots, respectively.

Both electric and magnetic fields induce currents in conducting objects, including people and animals. The magnitude of the induced current in objects under lines depends on the electric- or magnetic-field strength and the size and shape of the object. The currents induced in people, even from the largest transmission lines are generally too weak to be felt. However, under certain circumstances, contact to a grounded object by a well-insulated person in a high electric field can result in a perceived nuisance shock or spark discharge. Similarly, contact of a grounded person with an ungrounded large conducting object, such as a truck or tractor, in an electric field can result in a perceived nuisance shock due to the induced currents in the object. Transmission lines are designed and built so that such shocks occur infrequently and if they do, are no higher than the nuisance level. Stationary conducting objects such as metal buildings and fences near transmission lines are grounded to prevent them from being a source of shocks.

The possibility of health effects from long-term exposure to 60-Hz electric or magnetic fields has been researched for several decades. The consensus of scientific panels reviewing this research is that the evidence does not support a causal relationship between electric or magnetic fields and any adverse health outcomes, including childhood cancer, adult cancer, reproductive outcome, or other diseases. However, investigation of a statistical association between magnetic field exposure and childhood leukemia continues. It has not yet been possible to exclude a role for magnetic fields above 4 mG given the small number of persons studied with exposures at these levels and the problems of selecting appropriate control groups. Although uncertainty about possible effects of EMF on health has been considerably reduced in the past few years, concerned individuals can take low or no cost actions to reduce long-term exposures.

The research literature published to date has shown little evidence that exposure to EMF leads to adverse effects on domestic animals, wildlife and plants. (See Appendix J, *Assessment of Research Regarding EMF and Health and Environmental Effects*.)

3.12.2 Noise

3.12.2.1 Transmission Line Noise

Audible noise can be produced by transmission line ***corona***. In a small volume near the surface of the conductors, energy and heat are dissipated. Part of this energy is in the form of small local pressure changes that result in audible noise. Corona-generated audible noise can be characterized as a hissing, crackling sound that under certain conditions is accompanied by a 120-Hz hum.

For Your Information

Corona *is an electrical discharge, at the surface of a conductor. A technical definition is included in Chapter 9, (Glossary and Acronyms).*

Corona-generated audible noise is of concern primarily for contemporary lines operating at voltages of 345-kV and higher during foul weather. The conductors of high-voltage transmission lines are designed to be corona-free under ideal conditions. However, a protrusion on the conductor surface – particularly water droplets on or dripping off the conductors – cause electric fields near the conductor surface to exceed corona onset levels, and corona occurs. Therefore, audible noise from transmission lines is generally a foul-weather (wet-conductor) phenomenon. However, during fair weather, insects and dust on the conductors can also serve as sources of corona.

3.12.2.2 Substation Noise

The Schultz Substation is surrounded by rangeland, with some agricultural land to the south and one rural residence approximately 0.25 to 0.5 mile to the southeast. The site is relatively quiet, and due to the distance from the nearest residence, does not affect the surrounding area.

The Vantage Substation is located east of the Columbia River and is surrounded by open shrub-steppe habitat land and rangeland. As with the Schultz Substation, this site is relatively quiet.

The Midway Substation is located along the northern base of Umtanum Ridge, a short distance south of the Columbia River. The areas to the west, east, and north between the substation and the river are open shrub-steppe habitat land. Like the Schultz and Vantage Substation sites, this site is relatively quiet.

The Hanford Substation is located along the southeast side of the Columbia River. Except for facilities associated with the retired N-Reactor adjacent to the substation site to the north/northeast, the area surrounding the site is open shrub-steppe habitat land. The retired N-Reactor is not operating. The only noise produced is from workers who perform surveillance and maintenance at the site.

Sound varies at the substation sites as a result of weather and other factors such as background noise and the kind of equipment operating and could be higher or lower on any given day or at any given time at these substations.

The site of the new Wautoma Substation is currently an open field. Noise at this site is primarily background noise from wind and weather, with the sound of an occasional truck or automobile on the dirt road or distant Highway 24.

3.12.3 Radio and TV Interference

For Your Information

Electromagnetic interference (EMI) *is high-frequency electrical noise that can cause radio and television interference.*

Corona on transmission line conductors can generate electromagnetic noise in the frequency bands used for radio and television signals. In rare circumstances, corona-generated ***electromagnetic interference*** (***EMI***) can also affect communication systems and sensitive receivers. Interference with electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345-kV or higher. This is especially true of interference with television signals.

Radio reception in the AM broadcast band (535 to 1,604 kilohertz (kHz)) is most often affected by corona-generated EMI. FM radio reception is rarely affected. Generally, only residences very near transmission lines can be affected by radio interference.

Corona-caused television interference occurs during foul weather and is generally of concern only for conventional receivers within about 600 feet of a line. Cable and satellite television receivers are not affected.

Spark gaps on distribution lines and on low-voltage transmission lines are a more common source of radio and television interference than is corona from high-voltage transmission lines. This gap-type interference is primarily a fair-weather phenomenon caused by loose hardware and wires.

3.12.4 Toxic and Hazardous Materials

Minimal amounts of hazardous waste result from routine maintenance procedures performed on substation equipment and transmission lines. The type and volume of waste such as oily rags, minor leaks from vehicles, etc., depend on maintenance procedures.

The areas with the most human activities, specifically the YTC, the Wahluke Slope, and the Hanford Site are most likely to have hazardous materials issues.

The military conducts live-fire training and maneuvers at the YTC. Hazardous materials that might be encountered along the proposed routes through the YTC include live and spent ammunition, unexploded ordnance, petroleum products, and other military chemicals or explosives.

The Wahluke Slope, excluding the Hanford Reach National Monument, supports an intensive agricultural area. Hazardous materials that may be encountered in this area are related to agricultural operations, and include pesticides, fertilizers, and petroleum products. Pesticides and fertilizers may be encountered in their bulk form in storage or illegal disposal sites, in the form of spills, or after they have been applied to crops.

The Hanford Site includes retired radioactive material production facilities and active research and radioactive waste management facilities. These areas are well characterized because of the locations within the Hanford Site that are being considered for this proposal; therefore, radioactive materials should not be unexpectedly encountered.

Hazardous materials could be encountered anywhere along the proposed route and could include such things as illegally dumped waste, drug lab chemicals, spilled petroleum products, pesticides, and other wastes.

The 500-kV Schultz Substation has no transformers on site. A small amount of oil is in the power circuit breaker compressors and in the series capacitor cans. Contaminated oil, or polychlorinated biphenyl (PCB), may be present in the power circuit breakers and capacitor cans. There is no oil spill containment system for this substation, but BPA does have a Spill Prevention Control and Countermeasure Plan that puts in place protocols and procedures for response in case a spill or leak occurs.

The 500-kV Hanford Substation also has no transformers on site. Similar to the Schultz Substation, a small amount of oil is in the power circuit breaker compressors and in the shunt capacitor cans. PCBs may be in the compressors, but no PCBs are present in the shunt capacitor. This substation site also has a diesel tank that runs an engine generator. There is no oil spill containment system at this substation, but like Schultz Substation, BPA has a Spill Prevention Control and Countermeasure Plan in case a spill or leak occurs.

The 230/500-kV Vantage Substation includes a number of transformers on site that may contain PCBs. There are also two oil tanks on site. Unlike the Schultz and Hanford Substations, this substation does have an oil spill containment system in place for the two 500-kV transformer banks on site. It also has a Spill Prevention Control and Countermeasure Plan.

3.12.5 Fire

Numerous wildfires have occurred on private and public land in and around the proposed routes over the past several years. They may have been caused by human actions such as vehicle ignitions from roads, unattended campfires, burning of adjacent agricultural lands and arson, or by natural causes such as lightning.

Between 1980 and 1997, six wildfires were either started on or threatened public land in the Saddle Mountain Management Area. The cause of these fires ranged from lightning strikes to equipment use and railroad operations (BLM, 1997). Fires from similar causes have also affected the Saddle Mountain Unit of the Hanford Reach National Monument.

Due to the nature and intensity of the training that occurs at the YTC, the incidence of fire is higher on YTC land than on adjacent lands. The risk of fires at the YTC is largely dependent on the intensity, duration, and season of training activities taking place. The use of tracers and pyrotechnic devices as well as live-firing activities increases the fire risk (U.S. Army, 1996). Fire management is addressed in the management plan for the YTC (U.S. Army, 1996).

The Hanford Reach National Monument was established in June 2000. A Fire Management Plan has been completed that will provide for the perpetuation of natural conditions and processes within the monument/refuge, while managing wildlife fire to protect life, property, and cultural resources. This plan will help reduce hazards associated with unplanned fire events (USDOI/USFWS, 2001).

Farmers throughout the state, including those in central Washington near the line segments, burn agricultural fields to remove the remaining plant material after harvest and prepare for planting the next crop. To meet the requirements of the Washington State Clean Air Act of 1991, a statewide agricultural burning permit program has been implemented. This program includes permit conditions on when burns may occur and what materials may be burned (WAC 173-430). BPA does not expect to conduct any outdoor burning.

Chapter 4 — Environmental Consequences

In this Chapter:

- **Specific impacts from alternatives**
- **Recommended mitigation**
- **Cumulative impacts**

This chapter discusses the potential environmental impacts of the Agency Preferred Alternative (Alternative 2), other construction alternatives (Alternatives 1, 3, and 1A), and the No Action Alternative. Each alternative is composed of line segments discussed in Chapter 2, *Alternatives*, Section 2.1, *Segments*. Existing resources along each line segment are discussed in Chapter 3, *Affected Environment*. As in Chapter 3, this chapter discusses resources associated with the natural environment first and then the human environment. Impacts are discussed by alternative with reference to segments and the fiber optic line. A few resources (e.g., Air Quality) discuss the project as a whole because, for that resource, the impacts are the same for each alternative.

Impacts from the fiber optic line between Vantage and Midway, which is common to all alternatives, are included in the discussion of the transmission line for the Preferred Alternative. Also included with transmission line impacts in the Preferred Alternative are impacts from the fiber optic line between Midway and Wautoma. Impacts from the fiber optic line construction along the Vantage-Columbia line and the loop at Wautoma Substation are discussed separately.

To analyze potential impacts for construction, operation, and maintenance activities, resource specialists have analyzed actions using a scale with four impact levels: high, moderate, low, and no impact. Because definitions of these impact levels vary with each resource, explanations are provided with each of the resource discussions.

Specialists have considered the direct and indirect impacts of the alternatives over the short and long term. Direct impacts are caused by and occur at the same time and place as construction, operation, and maintenance activities. Indirect impacts are caused by the same activities but occur later in time or are farther removed in distance. However, these impacts are still reasonably foreseeable.

Impact discussions include recommended ***mitigation*** that could reduce both the direct, indirect, and ***cumulative impacts*** of the proposed alternatives. The level of detail for the impact discussions of

For Your Information

Please review Chapter 2, Alternatives, for a full description of the alternatives.

Refer to Map 2, Alternatives, to review locations of the line segments and alternatives.

Mitigation *describes measures that could be taken to lessen the impacts predicted for each resource. These measures may include reducing or minimizing a specific impact, avoiding it completely, or rectifying or compensating for the impact.*

Cumulative impacts *are created by the incremental effect of a specific action when added to other past, present, or reasonably foreseeable future actions.*

each resource depends on that resource's character and the significance of the issue. Additional detail for some resources is included in the appendices.

Construction of the alternatives would be typical of other BPA transmission line projects (for details, see Appendix C, *Construction Procedures*). General construction steps are summarized and information on structure site activities is given in the boxes below.

Construction Steps

Typical transmission line construction steps include:

- improving or constructing access roads
- clearing ROW
- preparing structure sites
- excavating and installing structure footings
- delivering structures to the sites (steel, insulators, conductors, and other miscellaneous equipment)
- assembling and erecting structures
- stringing and tensioning conductor, ground wire, and fiber optic cable
- installing counterpoise

Structure Site Activities

All vegetation would be removed from structure sites. Sites would be graded, if needed, to provide a level work area. An average area of about 100 ft by 150 ft would be disturbed at each structure site.

Each leg of a tower has a footing. Footings for suspension towers generally occupy an area of about 6 ft by 6 ft, to a depth of 12 ft. Footings at angle points would be larger and deeper, about 15 ft by 15 ft and 16 ft deep.

4.1 Water Resources, Soils, and Geology

For Your Information

For related water quality effects, see separate discussions under Sections 4.2, Floodplains and Wetlands; 4.4, Wildlife; and 4.5, Fish Resources.

Impacts to water, soils, and geology are interrelated and discussed as a group in this section.

4.1.1 Impact Levels

A **high** impact would occur where:

- a water body that supports sensitive fish, waterfowl, and animal habitat, or human uses such as drinking water would be extensively altered so as to affect its uses or integrity.
- the possibility of oil spills from substation equipment reaching groundwater would be high, such as in shallow groundwater areas, highly permeable soils, and where no secondary spill containment or protective measures are used.
- water quality would be degraded below state or federal agency standards and site conditions would be so unfavorable that major reclamation, special designs, or special maintenance practices would be required.

- road or facility construction or clearing would be required on sites that are prone to mass movement or have very high susceptibility to erosion.
- soil properties would be so unfavorable or difficult that standard mitigation measures, including revegetation, would be ineffective.
- long-term impacts associated with accelerated erosion, sedimentation, or disruption of unstable slopes would occur.

A **moderate** impact would occur where:

- water quality degrades below state or federal standards, but can be partially mitigated to lessen impacts. Site conditions require special planning and design.
- construction and clearing takes place near a water body on erodible soils that have moderate revegetation potential.
- new roads would be constructed across a stream or where existing stream crossings are inadequate and would require rebuilding.
- impacts would continue to occur until disturbed areas are reclaimed and sediment is no longer transported to surface waters.
- soil properties and site features are such that mitigation measures would be effective in controlling erosion and sedimentation within acceptable levels.
- impacts would be primarily short-term, with an increase in normal erosion rates for a few years following soil disturbance until erosion and drainage controls become effective.
- there would be little possibility of oils or other pollutants affecting groundwater because their level is deep, soils are relatively non-porous, and facilities have some minor spill protective measures.

A **low** impact would occur where:

- impacts to water quality could be easily mitigated to state or federal standards with common mitigation measures.
- there would be little or no possibility of oil or other pollutants affecting groundwater because their level is deep, soils are relatively non-porous, and facilities have good oil spill containment protective measures.
- structures or access roads near water bodies would be in stable soils on gentle terrain, with little or no clearing.
- structures would be away from water banks and little or no sediments would reach the water.

- there would be no construction or major reconstruction of roads.
- road and facility construction and clearing would be required on soils with low to moderate erosion hazard, and the potential for successful mitigation would be good using standard erosion and runoff control practices.
- erosion levels would be held near normal during and following construction.

No impact would occur where water quality and soils would remain unchanged.

4.1.2 Impacts Common to Construction Alternatives

Impacts to soils and geology are generally based on a site's susceptibility to long-term degradation. The following factors can increase a site's susceptibility:

- being prone to erosion and mass movement.
- having soils that are susceptible to compaction.
- having steep slopes.
- undergoing extensive clearing and access road construction.
- disturbing the soil surface and subsurface and removing vegetation increases the risk of soil erosion and mass movement, and may change soil productivity.

For Your Information

Turbidity *is a reduction in the clarity of water from suspended materials such as clay, mud, organic material, or other materials.*

There are several general impacts of concern relating to hydrology and water quality:

- Runoff can increase sedimentation and water ***turbidity***.
- Road improvements and vehicular traffic at stream crossings can increase turbidity and alter stream channels.
- When agriculture soils are disturbed, nutrients leached from the soil or transported on soil particles can stimulate the growth of undesirable aquatic vegetation.
- Clearing streamside vegetation can increase a stream's exposure to sunlight, possibly raising water temperature.

Direct impacts would be caused by access road construction and improvements, maintenance activities, ROW clearing, and site preparation for structures and other facilities such as pulling and reeling sites and fiber optic installation. Canals and creek crossings, including one shoreline of the State (Naneum Creek) crossing, would use existing bridges fords and culverts, or would have new fords or culverts installed in coordination with U.S. Fish and Wildlife Service (USFWS), Corps of Engineers (COE), and appropriate state agencies. New crossings would disturb the soil surface; increase erosion, runoff, and sedimentation in nearby watercourses; impair soil productivity; and remove land from production. The amount of soil exposed by project construction has been calculated using the best available information. Table 4.1-1, *Area of Ground Disturbance*, summarizes the area of ground disturbance, and Table 4.1-2, *Access Road Distances*, summarizes the length of new access roads and improvements to existing access roads.

For Your Information

It is not anticipated that impacts to ***303(d) streams*** would alter those parameters for which they are listed, as described in Section 3.1.2.1, *Water Quality*. In addition, impacts to aquifers are not anticipated, provided that the proposed project would comply with local ordinances and laws and state and federal water quality programs that prevent degradation of the quality of aquifers and do not jeopardize their usability as a drinking water source.

Section 303(d) streams, *as defined by the Federal Clean Water Act, are water quality limited streams that fall short of state surface water quality standards and are not expected to improve within the next four years.*

Table 4.1-1
Area of Ground Disturbance

	Preferred (2) (acres)	Alternative 1 (acres)	Alternative 3 (acres)	Alternative 1A (acres)	M-C Fiber** Route (acres)
Access Roads	84.55	118.55	295.75	156.05	-
Reeling sites	6.00	4.50	5.00	5.00	4.25
Substation	17.10	-	17.10	-	-
Towers	125.00	119.90	114.70	139.60	-
Total	232.65	242.95	432.05	300.65	4.25

*Sickler-Schultz Option 2 would add 0.85 acres to the alternative chosen.
**Midway-Columbia Fiber
Table has been updated for the FEIS.

Assumptions used to determine ground disturbance are found in Appendix C, Construction Procedures.

Table 4.1-2
Access Road Distances

	Preferred (2) (miles)	Alternative 1 (miles)	Alternative 3 (miles)	Alternative 1A (miles)
New Construction	18.0	22.6	95.2	43.4
Improvements to Existing	56.3	87.6	98.3	69.8
Total Length	74.3	110.2	193.5	113.2

Table has been updated for the FEIS.

Reminder

Rill erosion *is mild water erosion caused by overland flow producing very small and numerous channels.*

Gully erosion *is rapid erosion, usually in brief time periods, that creates a narrow channel that may exceed 100 ft. in depth.*

Best Management Practices *are a practice or combination of practices that are the most effective and practical means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.*

Some of the new access roads for the proposed project would be in steeply sloped terrain, which would increase soil exposure. Following construction, implementation of optimum erosion controls and revegetation of disturbed sites (cut and fill slopes and structure sites) would reduce the amount of soil exposure by about 60-70 percent. Impacts would be greatest in local sensitive areas susceptible to ***rill*** and ***gully*** erosion, and areas of unstable soil and rock. Short-term impacts during and following construction would be most intense. The intensity of long-term impacts would be directly proportional to the success of revegetation, and erosion and runoff control efforts. With implementation of ***Best Management Practices*** (BMPs), sedimentation could be reduced to acceptable levels and would not cause degradation of water quality below the Washington Department of Ecology (WDOE) standards. Impacts to water and soils are summarized in Table 4.1-3, *Impacts to Water and Soil Resources*.

Table 4.1-3
Impacts to Water and Soil Resources

Alternative	Actions	Impacts to Soil	Impacts to Water Resources
Preferred (2)	Construction of structures and access roads, use of fords or culverts at stream crossings, removal of structures, crossing of areas with 25-50% slopes and construction of fiber optic route.	Low to moderate erosion and loss of productive soils. Some increased runoff and sedimentation.	Short-term moderate sedimentation and increased runoff, short-term turbidity. Water bodies: Caribou, Coleman, Cooke Canyon, Naneum, Cave, Parke, Schnebly, Wilson, Columbia River[1,2,5], Johnson, Middle Canyon and various drainages. New Crossings: 5 fords and 2 culverts. Existing Crossings: 17 upgraded, 1 culvert replacement and 2 ford replacements.
1	Construction of structures and access roads, use of fords or culverts at stream crossings, removal of structures, construction of fiber optic route, crossing of areas with 25-50% slopes, crossing adjacent to Saddle Mountain Lake	Low to moderate erosion and loss of productive soils. Some increased runoff and sedimentation.	Short-term moderate sedimentation and increased runoff, short-term turbidity. Water bodies: Caribou, Coleman, Cooke Canyon, Naneum, Cave, Parke, Schnebly, Wilson, Columbia River[1,2,5], Johnson, Middle Canyon, Lower Crab [1,2,3,4,] Nunnally Lake, Saddle Mountain Wasteway, various canals and various drainages
3	Construction of structures and access roads, use of fords or culverts at stream crossings, removal of structures, construction of fiber optic route, crossing of areas with 25-50% slopes or greater.	Moderate erosion, increased runoff. Loss of productive soils.	Moderate sedimentation, short-term turbidity, increased runoff. Water bodies: Caribou, Coleman, Cooke Canyon, Naneum, Cave, Parke, Schnebly, Wilson, Alkali, Cold, Hanson, Johnson, Middle Canyon, Corral, various canals and drainages
1A	Improvements to existing access roads only, use of ford or culvert at Cold Creek crossing, crossing, construction of fiber optic route, areas with 25 to 45% slopes, double-circuit in agricultural lands	Low erosion, loss of productive soils	Short-term low sedimentation Water bodies: Cold Creek (intermittent at crossing during summer months), Caribou, Coleman, Cooke Canyon, Naneum, Cave, Parke, Schnebly, Wilson, Lower Crab Ck.[1,2,3,4], Columbia River[1,2,5], various canals, Mattawa Drain[2]: Nunnally Lake, Saddle Mountain Wasteway, various canals and drainages
No Action	Ongoing maintenance	None to low, localized soil disruption	Continued vehicle and machinery use and vegetation management practices.

303(d) listings for: 1-pH, 2-Temperature, 3-PCB, 4-DDE, 5-Dissolved gas, 6-DO, 7-Fecal Coliform
Table has been updated for the FEIS.

Increased sediment in streams is expected from the construction of an alternative. The volume of peak flow and the amount of sediment entering streams would depend on site-specific conditions. Mitigation measures proposed for construction of the line would help reduce the chance of large amounts of sediment entering streams. The new line would be constructed to prevent interference with ongoing farm conservation efforts to control erosion and maintain water quality. Although minor, localized increases in erosion, runoff, and sedimentation are expected from construction and maintenance. These increases would have a low impact on the area's soil resources and water quality, and would not impair the current beneficial use of any water body.

Controlling vegetation in the proximity of surface waters (such as creeks, rivers, lakes and wetlands) has the potential to affect the water quality and could indirectly affect groundwater aquifers. To minimize impacts to waters and soils, BPA uses the procedures developed in the Transmission System Vegetation Management Program DOE/EIS-0285. This program provides maintenance crews direction for how to manage vegetation on BPA rights-of-way and facilities. It also puts steps in place for ensuring environmental compliance on site-specific vegetation control projects. The program provides specific buffer widths that vary based on herbicide toxicities (defined for each herbicide used by BPA, by concentration, characteristics, and type of application used near water bodies, agriculture irrigation, domestic/public drinking water wells, water intakes/spring developments and sole source aquifers). BPA would follow the Transmission System Vegetation Management Program as part of vegetation maintenance policy to minimize impacts to water quality and vegetation. It is anticipated that there would be low to no impact on water quality from the use of herbicides to control vegetation near water bodies.

4.1.3 No Action Alternative

The impacts currently associated with ongoing maintenance activities for the existing transmission line, substations, and ROW would continue. These impacts include localized soil disturbance and potential sedimentation due to vehicular traffic, transmission structure replacement, vegetation management activities, and access road improvements. In addition, vehicle and machinery use, and vegetation management practices could contribute minor amounts of pollutants (e.g., fuel, oil, grease, rubber particulate, woody debris) that could be transported to streams.

4.1.4 Recommended Mitigation

Standard mitigation would use measures best suited to each individual location, in order to reduce erosion and runoff and stabilize disturbed areas during and after construction. The following measures, used alone or in combination, would minimize soil disturbance and the effects of increased erosion and surface runoff created by access road improvements and transmission line construction:

- Properly space and size culverts; use crossdrains, water bars, rolling the grade, and armoring of ditches; drain inlets and outlets.
- Coordinate all culvert and ford installations with the COE and other appropriate state agencies.
- Preserve existing vegetation where possible, and stabilize disturbed portions of the site. As soon as practicable, stabilization measures would be started where construction activities have temporarily or permanently ceased.
- Seed disturbed sites at the appropriate times to minimize the invasion of non-native species using a native herbaceous seed mixture suited to the site. Work with BLM, BOR, USDOA, and USFWS to determine appropriate seed mixture, planting times, and methods.
- Use vegetative buffers and sediment barriers to prevent sediment from moving off site and into water bodies.
- Discuss with farm operators ***sub soiling*** to restore soil productivity and monetary compensation.
- Design and construct all fords and bridges to minimize bank erosion.
- Schedule maintenance operations during periods when precipitation and runoff possibilities are at a minimum, in order to reduce the risk of erosion, sedimentation, and soil compaction.
- Design substation facilities to meet regional seismic criteria.
- If needed to stabilize the roadbed, consider ***full-bench road construction*** and hauling excess sidecast material on slopes exceeding 55 percent. Prior to construction, suitable waste areas should be located where excess materials can be deposited and stabilized.
- Use the BMPs that would prevent further impairment of water quality limited drainages.
- Avoid riparian areas, drainage ways, canals, and other water bodies. When these areas cannot be avoided, apply sediment reduction practices in order to prevent degradation of riparian or stream quality.
- Restrict road construction to the minimum needed and obliterate roads in agricultural land.

For Your Information

Compaction affects soil productivity, reduces infiltration capacity, and increases runoff and erosion. Sub soiling, normal farming, cultivation and cropping, and freeze-thaw cycles restore soils to their pre-construction condition.

Sub soiling *is plowing or turning up the layer of soil beneath the topsoil.*

Full-bench road construction *is cutting into the hillside to accommodate the whole road prism.*

- Avoid or mitigate water quality and fish habitat degradation. Design and maintain roads so that drainage from the road surface does not directly enter live streams, ponds, lakes, or impoundments. Direct water off of roads into vegetated areas, or control it through other sediment-reduction practices. Restrict road construction to areas that are physically suitable, based on watershed resource characteristics. Design stream crossings to avoid adverse impacts to stream hydraulics and deterioration of stream bank and bed characteristics.
- Avoid the discharge of solid materials, including building materials, into US waters. Off-site tracking of sediment and the generation of dust shall be minimized. Vegetative buffers would be left along stream courses to minimize erosion and bank instability.
- Prepare a stormwater pollution prevention plan (as required under the National Pollution Discharge Elimination System General Permit).
- Near all water bodies, set crossing structures as far back from stream banks as possible. Avoid refueling and/or mixing hazardous materials where accidental spills could enter surface or groundwater.
- Herbicide use to control vegetation near waterways will be used in accordance with the Transmission System Vegetation Management Program (USDOE, 2000), to limit impacts to water quality.
- Design the project to comply with state and federal water quality programs, in order to prevent degradation of the quality of aquifers and not jeopardize their usability as a drinking water source.

4.1.5 Cumulative Impacts

Current and future agriculture, YTC activities, and other land development activities in the watersheds crossed might increase peak flows and introduce sediment into streams. Increased sediment in streams is expected from construction of the project in addition to agricultural and other land disturbing activities. The volume of peak flow and the amount of sediment entering streams would depend on site-specific conditions. Implementing mitigation measures proposed for construction of the line would help reduce the chance of large amounts of sediment entering streams. This project would be constructed to prevent interfering with ongoing farm conservation efforts to control erosion and maintain water quality. Although minor, localized increases in erosion, runoff, and sedimentation are expected from construction and maintenance, these increases would have a low impact on the area's soil resources and water quality and would not impair the current beneficial use of any water body.

4.2 Floodplains and Wetlands

4.2.1 Impact Levels

Impacts would be considered **high** where:

- a wetland area would be destroyed by permanently filling all or most of it or by altering wetland hydrology.
- a wetland area would be destroyed that serves as habitat for a rare plant or animal species, or that is considered a rare wetland type.
- one or more significant wetland functions would be destroyed, such as the ability to provide wildlife habitat, improve water quality, detain water during peak flows, recharge groundwater, trap sediment, serve as a recreational use, or provide an aesthetically pleasing landscape.
- wetland vegetation cover type(s) would be permanently affected through altering soils or hydrology, such as converting a ***scrub-shrub wetland*** to an open-water area.
- all or most of the native wetland vegetation would be replaced with weedy, non-native species.
- the connectivity of a wetland to other wetlands, surface waterways, or sub-surface water features would be destroyed.
- a wetland ***buffer area*** would be destroyed, resulting in impaired wetland functions, such as the ability to provide wildlife habitat.
- The amount of flood storage in a floodplain would be significantly decreased, or the course of flood waters would be greatly altered.

For Your Information

Scrub-shrub wetlands *are wetlands that are dominated by low, woody vegetation.*

A ***buffer area*** *is a strip of vegetation surrounding a stream or wetland that provides habitat for wildlife, reduces or traps sediments, and slows runoff velocity.*

Impacts would be considered **moderate** where:

- a portion of a wetland area would be filled such that the majority of the wetland would still able to function as a wetland.
- a rare or unique wetland type would be degraded.
- one or more significant wetland functions would be degraded or impaired.
- the diversity of native plant species within a wetland would be significantly decreased.
- native trees in ***riparian*** areas would be removed.
- a native wetland plant community would be degraded through the introduction of weedy, non-native species.

Reminder

Riparian *refers to vegetated areas surrounding streams, rivers, lakes, or wetlands.*

- hydrology would be altered such that a wetland would decrease in size, or the vegetation cover type would be partially altered.
- the connectivity of a wetland to other waters would be diminished.
- a wetland buffer area would be partially destroyed or degraded, resulting in impaired wetland functions.
- the amount of flood storage in a floodplain would be moderately decreased.

Impacts would be considered **low** where:

- a wetland would be temporarily filled or wetland hydrology, soils, or vegetation would be altered. This would be followed by restoring the area to its former condition or enhancing the area.
- a wetland function or value would be temporarily disrupted or partially diminished.
- the amount of flood storage in a floodplain would slightly decrease (e.g., due to erecting a structure in a floodplain).

No impact would occur where:

- direct impacts to wetlands or buffers would be avoided.
- wetland hydrology, vegetation, or soils would not be affected by nearby activities.
- the functions of a wetland area would not be affected by nearby activities.
- direct impacts to floodplains would be avoided.

4.2.2 Impacts Common to Construction Alternatives

Floodplains within the study area may be directly impacted by the placement of structures in several locations. It is not expected that constructing access roads to these structures would significantly impact floodplains, because this construction would not alter the amount of flood storage or the course that flood waters would take.

Most of the wetlands within the study area are not extensive, and would be spanned by structures placed in upland areas adjacent to wetlands. Roads and culvert crossings would be designed to minimize impacts to wetland areas.

The ongoing maintenance of transmission lines and access roads could impact wetlands in several ways. Some trees may need to be removed for safety reasons. Because trees are uncommon along riparian areas in shrub-steppe communities, they serve an important function as nesting and perching habitat for birds. For this reason,

Reminder

Noxious weeds *are particularly troublesome weeds designated by Washington State law. The list of noxious weed species is divided into three classes (A, B, and C) within each county, based on the state of invasion.*

removing trees is considered a moderate level of impact. Roads serve as a corridor for invasion by some weed species that tend to grow in wet areas. If ***noxious weeds*** were introduced into riparian or wetland areas as a result of project activities, this would be a moderate level of impact. Spraying of weeds along roads may affect wetland water quality, a low level of impact. Road maintenance and grading may increase sedimentation into wetlands, a low level of impact.

4.2.3 Preferred Alternative (Alternative 2)

The Preferred Alternative, comprised of Segments A, Option B_{SOUTH}, D, and the fiber route from Vantage to Columbia, was field surveyed for wetlands in summer 2002. A total of six wetlands were identified along Segment A. No wetlands were found along segments B_{SOUTH} and the Vantage Columbia fiber route. One wetland associated with Lower Crab Creek was identified on Segment D. The field survey determined that all other NWI identified features in Section 3.2 are not wetlands.

4.2.3.1 Segment A

The field survey identified 6 wetlands along Segment A. Wetlands associated with the Nanuem/Wilson Creek crossing would have moderate impacts from construction of one structure. One would have a low impact from an existing road to be reconstructed. One wetland would be avoided resulting in no impacts. Some trees would be removed from Cooke Creek resulting in a moderate impact (See Table 4.2-1, *Segment A Impacts to Wetlands*.)

The Sickler-Schultz Reroute also crosses an emergent wetland associated with Naneum Creek and a forested wetland associated with Wilson Creek. Under Option 1 of the Sickler-Schultz Reroute, trees would be removed from the Wilson Creek wetland resulting in a moderate impact.

One structure and a new access road would be constructed within the 100-year floodplain of Naneum/Wilson creek, slightly decreasing the amount of flood storage, which would be a low level of impact. The floodplain of Cooke Creek would be avoided resulting in no impact to the 100-year floodplain.

Table 4.2-1
Segment A Impacts to Wetlands

Feature	Classification	Township, Range, Section	Potential Impacts (Level of Impact)
Naneum Creek (Sickler-Shultz Reroute, Options 1 & 2)	Emergent wetland	T19N, R19E, Sec 20	No impacts
Wilson Creek (Sickler-Shultz Reroute Option 1)	Forested wetland	T19N, R19E, Sec 20	Four trees would be removed. (Moderate Impact)
Wilson Creek (Sickler-Shultz Reroute Option 2)	Forested wetland	T19N, R19E, Sec 20	No impacts
Naneum/Wilson Creek, associated wetland, and man made swale	Palustrine, scrub-shrub and emergent wetland, seasonally flooded	T19N, R19E, Sec 20, 21	New transmission structure partially within associated wetland, tower and road within floodplain (Moderate Impact)
Ephemeral drainage and wetland	Riverine (seep), intermittent, seasonally flooded, & Palustrine emergent wetland, seasonally flooded	T19N, R19E, Sec 35	Existing access road to be reconstructed, existing culvert to remain (Low Impact)
Cooke Creek associated wetland	Palustrine, forested wetland, seasonally flooded	T18N, R20E, Sec 6	Access road will avoid creek and associated wetland, floodplain would be avoided, transmission line spans creek and associated wetland, 25-30 cottonwood trees would be removed (Moderate Impact)
Caribou Creek associated wetland	Palustrine, scrub-shrub wetland, seasonally to permanently flooded	T18N, R20E, Sec 8	Access road will avoid creek and associated wetland (No Impact)

Table has been updated for the FEIS.

4.2.3.2 Segment B

The Preferred Alternative would follow Option B_{SOUTH} of Segment B.

Option B_{SOUTH} - The transmission line would span the floodplain of the Columbia River resulting in no impact to the 100-year floodplain on segment B. No wetlands were found during a wetland field survey. Therefore, no impact would occur to wetlands along Segment B_{SOUTH}.

Option B_{NORTH} – Option B_{NORTH} would span all wetlands and riparian areas. Two narrow wetlands associated with creeks are located along Segment B_{NORTH}. Although structures would be placed outside riparian areas, these creeks may be traversed by an access road, which would be a moderate level of impact. Structures would not be placed within the Columbia River floodplain, resulting in no impact. (See Table 4.2-2, *Option B_{NORTH} Impacts to NWI Mapped Wetlands*.

Table 4.2-2
Option B_{NORTH} Impacts to NWI Mapped Wetlands

Feature	Classification	Township, Range, Section	Potential Impacts (Level of Impact)
Unnamed creek	palustrine, emergent wetland, persistent vegetation, temporarily flooded	T16N, R22E, Sec 15	Possible Access Road Crossing (Moderate)
Unnamed creek	riverine, seasonally flooded	T16N, R22E, Sec 23	Possible Access Road Crossing (Moderate)

Table has been updated for the FEIS.

4.2.3.3 Segment D

Structures along Segment D would avoid all wetlands and riparian areas (See Table 4.2-3, *Segment D Impacts to Wetlands*.) The transmission line would span the floodplain of the Columbia River and Lower Crab Creek. A new access road with two 9-foot arch culverts would cross Dry Creek and its 100-year floodplain, which would be a high impact.

The proposed Wautoma Substation will be built above the floodplain, therefore no impacts to the floodplain from the substation would occur.

Table 4.2-3
Segment D Impacts to Wetlands

Feature	Classification	Township, Range, Section	Potential Impacts (Level of Impact)
Lower Crab Creek	Palustrine emergent wetland, persistent vegetation, seasonally to permanently flooded	T15N, R23E, Sec 2	No road crossing (No Impact)

Table has been updated for the FEIS.

Reminder

Segment A would have a moderate impact to wetlands and no impact to floodplains, Segment B would have no impact to wetlands or floodplains.

4.2.4 Alternative 1

Impacts to wetlands along Segments A and B_{SOUTH} would be the same as described under the Preferred Alternative (See Section 4.2.3.1, *Segment A* and Section 4.2.3.2 *Segment B)*. Segment E did not receive field verification for wetlands. If Alternative 1 were chosen, wetland surveys would be completed on Segment E to verify the presence of wetlands and impacts.

4.2.4.1 Segment E

No structures along Segment E would be constructed within a wetland or riparian area. There may be trees in riparian areas that would need to be removed for safety, a moderate level of impact. Floodplain impacts will be minimized by designing and placing road crossings to maintain existing channel properties and floodplain function.

In the valley agricultural areas, the proposed line would cross four irrigation ditches that have NWI designations. Structures would be situated to avoid these ditches, although they may be crossed by access roads, a moderate level of impact. (See Table 4.2-4, *Segment E Impacts to NWI Mapped Wetlands*.)

Table 4.2-4
Segment E Impacts to NWI Mapped Wetlands

Feature	Classification	Township, Range, Section	Potential Impacts (Level of Impact)
Wetland	palustrine, emergent, persistent vegetation, seasonally flooded	T16N, R23E, Sec 35	No Impact
Wetland	palustrine, emergent, persistent vegetation, seasonally flooded	T16N, R23E, Sec 35	No Impact
Wetland fed by outflow channel from Nunnally Lake	lacustrine, littoral, unconsolidated bottom, permanently flooded and diked/impounded	T16N, R23E, Sec 35	No Impact
Lower Crab Creek	palustrine, emergent wetland, with persistent vegetation, seasonally to permanently flooded	T15N, R23E, Sec 2	No Road Crossing (No Impact) Possible Tree Removal (Moderate)
Irrigation ditch	riverine, artificially flooded, seasonally flooded, excavated	T15N, R24E, Sec 25	Possible Access Road Crossing (Moderate)
Irrigation ditch	riverine, excavated	T15N, R25E, Sec 31	Possible Access Road Crossing Moderate)
Irrigation Ditch	palustrine, open water, semi-permanently flooded, excavated	T15N, R25E, Sec 11	Possible Access Road Crossing (Moderate)
Irrigation Ditch	riverine, artificially flooded, seasonally flooded, excavated	T14N-R26E-11	Possible Access Road Crossing (Moderate)
Saddle Mountain Lake	riverine, semipermanently flooded	T14N, R26E, Secs. 20 & 29	No Impact
Columbia River	palustrine, emergent, with persistent vegetation, seasonally flooded	T14N-R26E-29 & 28	No Impact

Table has been updated for the FEIS.

Reminder

Segment A would have a moderate impact to wetlands and no impacts to floodplains.

4.2.5 Alternative 3

Impacts to wetlands along Segment A would be the same as described under the Preferred Alternative. (See Section 4.2.3.1, *Segment A*.) Segment C did not receive field verification for wetlands. If Alternative 3 were chosen, wetland surveys would be completed on Segment C to verify the presence of wetlands and impacts.

4.2.5.1 Segment C

Structures along Segment C would avoid all wetlands and riparian areas. The NWI depicts 12 narrow wetlands associated with streams. Access roads may need to be constructed across most of these streams, a moderate level of impact. (See Table 4.2-5, *Segment C Impacts to NWI Mapped Wetlands*.) A new access road with two 9-foot arch culverts would cross Dry Creek and its 100-year floodplain, which would be a high impact. The proposed Wautoma Substation would be built above the floodplain, therefore no impacts to the floodplain from the substation would occur.

Table 4.2-5
Segment C Impacts to NWI Mapped Wetlands

Feature	Classification	Township, Range, Section	Potential Impacts (Level of Impact)
Johnson Creek	palustrine, emergent wetland, with persistent vegetation, seasonally flooded	T16N, R22E, Sec 20	Possible Access Road Crossing (Moderate)
Hanson Creek	palustrine, emergent wetland, with persistent vegetation, seasonally flooded	T15N, R22E, Sec 8	Possible Access Road Crossing (Moderate)
Cottonwood Creek	riverine, seasonally flooded, mapped to the east of the proposed line; palustrine, emergent wetland, with persistent vegetation, seasonally flooded, mapped to the west	T15N, R22E, Sec 21	Possible Access Road Crossing (Moderate)
Unnamed creek	riverine, seasonally flooded (includes two forks of the creek)	T15N, R22E, Sec 28	Possible Access Road Crossing (Moderate)
Creek in Alkali Canyon	palustrine, emergent wetland, with persistent vegetation, seasonally flooded	T14N, R22E, Sec 3	Possible Access Road Crossing (Moderate)
Creek in Corral Canyon	palustrine, scrub-shrub wetland, with broadleaf deciduous vegetation, temporarily flooded	T14N, R22E, Sec 15	Possible Access Road Crossing (Moderate)
Tributary to creek in Corral Canyon	palustrine, emergent wetland, with persistent vegetation, seasonally flooded	T14N, R22E, Sec 14	Possible Access Road Crossing (Moderate)
Tributary to creek in Corral Canyon	riverine, seasonally flooded	T14N, R22E, Sec 23	Possible Access Road Crossing (Moderate)
Creek in Sourdough Canyon	riverine, seasonally flooded	T14N, R22E, Sec 25	Possible Access Road Crossing (Moderate)
Cold Creek	riverine, seasonally flooded	T13N, R23E, Sec 20	Possible Access Road Crossing (Moderate)
Tributary to Cold Creek	riverine, seasonally flooded	T13N, R23E, Sec 35	Possible Access Road Crossing (Moderate)
Dry Creek	riverine, seasonally flooded	T12N, R24E, Sec 20	No impact

Table has been updated for the FEIS.

Reminder

Segment A would have a moderate impact to wetlands and no impact to floodplains, Segment B would have no impact to wetlands or floodplains.

4.2.6 Alternative 1A

Impacts to wetlands along Segments A and B_{SOUTH} would be the same as described under the Preferred Alternative (See Section 4.2.3.1, *Segment A* and Section 4.2.3.2 *Segment B)*. Segment F did not receive field verification for wetlands. If Alternative 1A were chosen, wetland surveys would be completed on Segment F to verify the presence of wetlands and impacts.

4.2.6.1 Segment F

Structures along Segment F would avoid all wetlands and riparian areas. There are nine features depicted on the NWI maps. Access roads may need to be constructed across two of these streams, a moderate level of impact. Some of the trees that line the edge of Nunnally Lake might need to be removed, a moderate level of impact. Floodplain impacts will be minimized by designing and placing road crossings to maintain existing channel properties and floodplain function.

Roads and structures would avoid two emergent wetland areas north of Lower Crab Creek. The wetlands along Lower Crab Creek would be spanned, but there may be trees in the riparian area that would be removed or topped, a moderate level of impact.

In the valley agricultural areas, an access road would cross an irrigation ditch that has a NWI designation and possibly a wetland, a moderate impact. (See Table 4.2-6, *Segment F Impacts to NWI Mapped Wetlands*.)

Reminder

Mapped wetlands are shown on Map 5, Wetlands/Plant Associations.

Table 4.2-6
Segment F Impacts to NWI Mapped Wetlands

Feature	Classification	Township, Range, Section	Potential Impacts (Level of Impact)
Nunnally Lake	lacustrine, limnetic, open water/unknown bottom, permanently flooded	T16N, R23E, Sec 25-36	No Road Crossing (No Impact) Possible Tree Removal (Moderate)
Wetland	palustrine scrub-shrub wetland/emergent wetland with persistent vegetation, seasonally flooded	T16N, R23E, Sec 36	No Impact
Wetland	palustrine, emergent wetland with persistent vegetation, seasonally flooded	T16N, R23E, Sec 36	No Impact
Wetland north of Lower Crab Creek	palustrine, emergent wetland with persistent vegetation, seasonally flooded	T16N, R23E, Sec 36	No Impact
Lower Crab Creek	riverine, lower perennial, open water, permanently flooded	T16N, R23E, Sec 36	No Road Crossing (No Impact) Possible Tree Removal (Moderate)

Feature	Classification	Township, Range, Section	Potential Impacts (Level of Impact)
Irrigation Ditch	palustrine, open water, semi-permanently flooded, excavated	T15N, R26E, Secs. 21 and 28	Possible Access Road Crossing (Moderate)
Wetland	palustrine, emergent wetland	T14N, R26E, Secs. 16 and 21	Possible Access Road Crossing (Moderate)
Saddle Mountain Lake	palustrine, emergent, with persistent vegetation, seasonally flooded	T14N, R26E, Secs. 20 and 29	No Impact
Columbia River	riverine	Secs. 29 and 28	No Impact

Table has been updated for the FEIS.

4.2.7 No Action Alternative

Current levels of disturbance to wetlands and floodplains would continue under this alternative. The impacts currently associated with ongoing maintenance activities for the existing transmission line, substations, and ROW would continue. These impacts include localized soil disturbance and potential sedimentation due to vehicular traffic, transmission structure replacement, vegetation management activities, and access road improvements. In addition, vehicle and machinery use, and vegetation management practices could contribute minor amounts of pollutants (e.g., fuel, oil, grease, rubber particulate, woody debris) that could be transported to wetlands.

4.2.8 Recommended Mitigation

Before and during construction, the following procedures and construction practices would be adopted to ensure that designated wetland and riparian areas are not impacted:

- Wetlands would be mapped, along with buffer areas to avoid direct and indirect impacts.
- Workers would receive instruction in construction practices that avoid or minimize wetland impacts.
- Workers would be informed of which areas are restricted and must not be impacted.
- Restricted wetland and riparian areas would be mapped.
- The boundaries of restricted areas, such as protected wetland and riparian areas, would be flagged by a wetland scientist prior to construction, using designated flagging to ensure that workers do not unintentionally enter restricted wetland areas.
- Wetland impacts from road crossings would be minimized through proper culvert design, timing, and methods of installation.
- Indirect impacts to wetlands and waterways from sedimentation and erosion would be minimized, by erecting silt fences or other appropriate sediment control devices around areas where soil

would be disturbed when construction is to occur near a wetland or waterbody.

- To minimize temporary impacts, avoid compacting wet soils and minimize harm to herbaceous vegetation, vehicle crossings of wetland areas would be accomplished using equipment mats that would be removed after construction.
- Herbicide use to control vegetation near waterways will be used in accordance with the Transmission System Vegetation Management Program (USDOE, 2000), to limit impacts to water quality.
- Conditions placed within the Section 404 Removal/Fill Permit would be met. (See Section 5.16, *Discharge Permits under the Clean Water Act* for permit discussion.)

Ongoing maintenance practices would be conducted with a sensitivity to the issues of wetland and riparian areas. Road grading and other disturbances to the road surface would be minimized near riparian areas. If any weeds occur along roads adjacent to wetlands and riparian areas, only herbicides approved for aquatic use would be used.

4.2.9 Cumulative Impacts

Wetlands would be impacted by any projects within the Columbia Basin that affect wetland functions and values, including the filling of wetland areas. Projects such as land development, agriculture, and pipeline development may impact wetlands in the study area. Wetland loss and floodplain impacts reduce flood storage capacity and affects water quality. As development occurs, the need for flood storage increases.

Information is available that quantifies wetland impacts in central Washington (Pers. Comm. Catherine Reed, WDOE, 2001). Between July 1, 2000 and July 1, 2001, two permits were issued in Benton, Grant, Kittitas and Yakima Counties for projects that disturbed wetlands, for a total of 0.83 acre of disturbed area. This information on the number of permitted wetland impacts may not accurately reflect wetland loss because wetland impacts can occur without regulating agencies' knowledge. Also, some people are unaware that temporarily wet areas may be ***ephemeral wetlands*** that meet wetland criteria. Many wetlands may be filled without permits.

For Your Information

Ephemeral wetlands *are wetlands that are only filled with water for a brief time during the spring.*

One of the most common types of wetland impacts in the study area are road crossings. One of the main impacts from roads crossing wetlands and waterways is the spread of weed species into previously undisturbed areas, a major problem in central Washington (Pers. Comm. Catherine Reed, WDOE, 2001).

4.3 Vegetation

4.3.1 Impact Levels

➡ Reminder

high quality plant communities *are areas of native vegetation with little or no disturbance or exotic species.*

Impacts would be considered **high** where:

- the quantity or quality of a unique or ***high quality plant community*** would be significantly reduced.
- the substrate would be altered such that recovery of a unique or high quality plant community would not be likely.
- the diversity within a high quality native plant community would be significantly decreased.
- impacts would result in the taking of a federally listed, proposed, or candidate plant species.
- noxious weeds would be introduced into a high quality native plant community.
- <u>Noxious weeds would be introduced into a rare plant population.</u>

Impacts would be considered **moderate** where:

- native plant communities would be permanently removed through removal of plant parts and/or altering the substrate.
- the diversity within a native plant community would be decreased or the community would be degraded as a result of altering physical characteristics (e.g., increasing erosion).
- <u>removing the native species component of a plant community where native species are a minor component.</u>
- Native tree species in riparian areas would be removed or topped.
- <u>the density of noxious weeds is increased in a location where they are already present.</u>
- impacts to a federally listed, proposed, or candidate plant species would not affect the viability of local populations of that species.
- impacts to rare or ***endemic*** plant species (including federal species of concern, ***BLM*** <u>special status</u> species, and state listed species) could only be partially lessened by mitigation.

Endemic *is a naturally occurring species that is limited to a particular geographic area.*

BLM*: U.S. Bureau of Land Management*

Impacts would be considered **low** where:

- native plant communities would be temporarily disturbed or altered such that natural recovery to pre-disturbance conditions would be likely.
- the life history of native plant species would be temporarily impaired through disturbance to vegetative portions, impairing the functioning of pollinator species, or decreasing reproductive potential.
- vegetation would be permanently removed from a plant community dominated by non-native species.
- a population of rare plants would be temporarily impacted, but could be completely mitigated (as demonstrated through subsequent monitoring).
- the density of noxious weeds or other undesirable non-native species would be increased in areas where they were already present.

No impact would occur where:

- direct or indirect disturbance to native plant communities would be avoided.
- the habitats of rare or endemic plant species would be completely avoided.
- there would be no increase in the cover or distribution of weedy, non-native species.

4.3.2 Impacts Common to Construction Alternatives

4.3.2.1 Construction Impacts

Plant communities would be directly and indirectly impacted as a result of various project activities, and these impacts may be temporary or permanent. Some impacts to vegetation from construction activities would be fairly consistent among all the alternatives, such as the potential spread of weed species into disturbed areas.

For Your Information

*When referring to vegetation, **aspect** is the direction a slope is facing.*

The amount of disturbance to vegetation caused by a particular activity would depend on a variety of factors, including the type of vegetation and site characteristics (e.g., soil type, slope, elevation, ***aspect***, and amount of moisture). In general, shrub-steppe plant communities are slow to recover from disturbance. Although little is known about how well they recover or how long it takes, the effects of disturbance are well documented.

Riparian areas are particularly vulnerable to disturbance. The removal of vegetation along waterways causes an increase in water temperature, increases water velocity, and decreases wildlife habitat. Disturbance of soil in or near riparian areas may lead to erosion of stream banks, which increases the deposition of sediment into waterways. In riparian areas where trees or tall growing vegetation pose a safety hazard to transmission lines, they would need to be removed (a moderate level of impact).

In relatively undisturbed areas, soil disturbance decreases the soil cover provided by ***biological crusts***. Disturbance of biological crusts decreases soil fertility and increases the likelihood that an area would be invaded by non-native species. It is difficult to determine the extent of this impact, because the location and quality of biological crusts within the study area is not known. The disturbance of biological crusts in native plant communities would be a moderate level of impact.

For Your Information

Biological crusts *are groups of living organisms that coat the soil or live just below the soil surface.*

The construction of new access roads would involve clearing the proposed road area to a width of at least 20 feet (14 feet permanent impact and 6 feet temporary impact). The construction of new access roads would create a high level of impact in areas with high quality native plant communities. A moderate level of impact would result from road construction in less pristine native plant communities. In disturbed areas or in agricultural areas, the impacts to areas adjacent to roads would be temporary, and the impact level would be low to none.

The construction or replacement of structures would require the removal of vegetation. The size of the cleared area would vary depending on site characteristics, but the area that may be cleared and leveled by grading would be approximately 150 by 100 feet. During construction, heavy machinery would enter the area around structures, which would compact soils. Structures are generally built on the slopes or ridges above riparian areas. Construction of structures can decrease slope stability, which can lead to degradation of plant communities on the slope and in the riparian area. Depending on the type of plant community present, the construction of structures would create a moderate to high level of impact in all segments.

Reminder

Please refer to Chapter 2, Alternatives, for further detail on project construction activities.

Some construction-related impacts would be temporary. Heavy machinery may enter portions of the new ROW outside the cleared area during tensioning of the conductor. Although the aboveground portion of shrubs would be broken or crushed, the roots and soils would not be disturbed, and vegetation would eventually return to pre-disturbance conditions. Depending on the type of plant community present, the temporary impacts resulting from movement of vehicles would be a low to moderate level of impact in all segments.

Fragmentation of some plant communities, especially shrub-steppe, by construction of roads and other disturbance can lead to a loss of biodiversity and reduction in overall plant community health and quality. As plant communities become smaller and more fragmented, they become more susceptible to outside influences such as invasive weed species. They also become less able to sustain themselves because many plant species have limited seed dispersal ability so recolonization of disturbed areas may take many years or not occur at all due to competition from other species.

Rare plant species may be directly or indirectly impacted by construction activities. They can be directly impacted when the plants or their habitat are destroyed or altered such that they can no longer survive. Rare plants growing outside the construction zone may be harmed if the effects of the activities degrade their habitat. This could occur through soil erosion, decrease in slope stability, or other alterations of physical conditions that make it difficult for the species to survive. One important cause of habitat degradation is invasion by non-native species from adjacent disturbed areas. The level of impact would depend on the status of the species, and whether mitigation could be implemented to lessen the impact.

Tables 4.3-1, *Permanent Impacts to Vegetation*, and 4.3-2, *Temporary Impacts to Vegetation*, list the permanent and temporary impacts to different types of vegetation within the study area for each alternative. The Forest and Shrub-Steppe categories account for the majority of the vegetation within the study area; while vegetation associated with agricultural operations is a lesser component. Forest lands are generally composed of riparian vegetation although one small area of upland forest is present along Segment A which is common to all alternatives. Vegetation in the Range category is shrub-steppe.

Table 4.3-1
Permanent Impacts to Vegetation

	Structures, Roads, Reeling Sites, & Substation Impacts (estimated acres)			
Existing Vegetation	**Preferred (2)**	**Alternative 1**	**Alternative 3**	**Alternative 1A**
Agriculture	0.85	3.90	0.00	0.55
Forest	0.10	0.10	0.10	0.10
Shrub-Steppe	44.60	39.50	175.65	79.00
Total	**45.55**	**43.50**	**175.75**	**79.65**

Sickler- Schultz Reroute Option 2 would add 0.05 ac of permanent disturbance to shrub-steppe.
New table for the FEIS.

Reminder

Assumptions used in calculating permanent and temporary impacts are in Appendix C, Construction Procedures.

Table 4.3-2
Temporary Impacts to Vegetation

	Structures, Roads, Reeling Sites, Staging Areas & Substation Impacts (estimated acres)			
Existing Vegetation	**Preferred (2)**	**Alternative 1**	**Alternative 3**	**Alternative 1A**
Agriculture	22.10	22.05	2.00	2.80
Forest	2.10	2.95	3.25	2.10
Shrub-Steppe	161.45	174.10	251.20	215.25
Total	**185.65**	**199.10**	**256.45**	**220.15**

Sickler- Schultz Reroute Option 2 would add 0.80 ac of temporary disturbance to shrub-steppe.
New table for the FEIS.

4.3.2.2 Operations and Maintenance Impacts

Access roads would need to be maintained and repaired. Maintenance vehicles traveling on access roads may contribute to the spread of weed species. Please refer to the following *Weed Invasion Impacts* (Section 4.3.2.3) for further detail. Maintenance vehicles may also need to travel off of established access roads. Because these impacts would occur in areas already impacted by construction activities, the level of impact would be low to moderate.

4.3.2.3 Weed Invasion Impacts

After disturbance, bare land would likely be invaded by non-native species. Seeds may be blown in, transported in by animals or water, or introduced inadvertently on the clothing, equipment, or vehicles of construction or maintenance workers. Because non-native species usually lack the soil-binding characteristics of native species, cover by non-native species may result in increased erosion. This type of degradation over time can decrease the soil's ability to support a healthy native plant community (YTC Management Plan). Disturbed plant communities generally show a reduction in native plant species cover, particularly bunchgrasses and forbs (Franklin, 1973).

Some of the non-native species that invade disturbed land would be noxious weed species. An increase in weed species, principally cheatgrass and diffuse knapweed, can be expected during the growing season following any ground disturbance within the study area (Pers. Comm. D. Stout and M. Sackschewsky, 2001).

Reminder

*A **forb** is an herbaceous plant that is not a grass*

Cheatgrass is a strong competitor that rapidly colonizes disturbed sites and once established, it outcompetes other grasses and ***forbs***. It has invaded much of the study area and would increase in density with any disturbance. Diffuse knapweed is already present in all project segments. The spread of this aggressive species is of great concern because it quickly occupies disturbed sites and tends to outcompete desirable native species. This species also moves from disturbed sites into adjacent undisturbed areas. This type of invasion can be a major threat to sensitive species habitat. Because of their poor soil-holding capabilities, knapweed species such as diffuse knapweed contribute to soil erosion (YTC Management Plan).

The use of access roads for ongoing maintenance increases the probability of weed invasion. Roads are known to contribute to the spread of noxious weeds by forming a corridor for weed and weed seed dispersal. Weeds are dispersed when parts of weeds or the entire plant break off and get stuck to the undercarriages of vehicles. Weeds get dragged into new areas, and if the plant has formed seed heads, the seeds are dispersed as the vehicle travels. Because access roads cross riparian areas, weed seeds may fall into riparian areas, be dispersed by water, and begin to grow in the moist soil. Wetlands and riparian areas are particularly susceptible to invasion by non-native species.

Introducing noxious weeds into a high quality native plant community is a high level of impact. The introduction of noxious weeds or undesirable non-native species into areas where they are already present, as in much of the study area, is a low level of impact.

4.3.3 Preferred Alternative (Alternative 2)

The preferred alternative includes Segments A, Segment B (Option B_{SOUTH}), Segment D and the fiber optic line. A rare plant survey was done that characterized plant communities. Table 4.3-3, *Impacts to Vegetation on Preferred Alternative*, describes the project's expected impacts to the Agriculture, Forest, and Shrub-Steppe vegetation types listed in Table 4.3-1, *Permanent Impacts to Vegetation*, and Table 4.3-2, *Temporary Impacts to Vegetation*. As described in Section 3.4.1 the shrub-steppe category was broken into four sub-categories to better characterize impacts to specific vegetation resources.

Table 4.3-3
Impacts to Vegetation on Preferred Alternative

Vegetation Type		A (acres)	BSOUTH (acres)	D (acres)	V-C* Fiber Optic Line (acres)	Total (acres)
Agricultural		0.00 –T 0.00 –P	0.00 –T 0.00 –P	20.35–T 0.85 –P	1.75 –T 0.00 --P	22.10 –T 0.85 –P
Forest		2.10 -T 0.10 -P	0.00 -T 0.00 -P	0.00 -T 0.00 -P	0.00 -T 0.00 -P	2.10 –T 0.10 –P
Shrub-Steppe	Washington Natural Heritage Program areas	0.00 -T 0.00 -P	0.00 -T 0.00 -P	2.10 -T 0.25 -P	0.25 -T 0.00 -P	2.35 –T 0.25 -P
	Moderate-High Quality Shrub Steppe	29.20 -T 9.95 -P	31.70 -T 6.35 -P	26.00 -T 5.55 -P	0.50 -T 0.00 -P	87.40 –T 21.85 -P
	Low Quality Shrub Steppe	8.10 -T 2.05 -P	0.00 -T 0.00 -P	22.75 -T 11.75 -P	1.50 -T 0.00 -P	32.35 –T 13.80 –P
	Lithosol Areas	39.35 -T 8.70 -P	0.00 -T 0.00 -P	0.00 -T 0.00 -P	0.00 -T 0.00 -P	39.35 –T 8.70 -P
	Shrub-Steppe Total	76.65 -T 20.70 -P	31.70 -T 6.35 -P	50.85 -T 17.55 -P	2.25 -T 0.00 -P	161.45–T 44.60 -P
Total Vegetation		78.75 –T 20.80–P	31.70 -T 6.35 -P	71.20 -T 18.40 -P	4.00 –T 0.00 --P	185.65–T 45.55 -P

T-Temporary, P- Permanent
*V-C: Vantage-Columbia
New table for the FEIS.

Reminder

Assumptions used in calculating permanent and temporary impacts are in Appendix C, Construction Procedures.

4.3.3.1 Segment A

Segment A consists mostly of shrub-steppe vegetation with some small areas of upland and riparian forest.

The ***WNHP*** high quality plant community Wyoming big sagebrush/bluebunch wheatgrass, occurs along 0.2 mile of Segment A.

Reminder

WNHP: *Washington Natural Heritage Program*

No access roads or towers would be placed in this area (the line would span the community) therefore there would be no impacts to the Wyoming big sagebrush/bluebunch wheatgrass WNHP community.

The moderate-high quality shrub-steppe and lithosol areas generally are in good condition with high percentages of native species and relatively low disturbance. Impacts to these areas would be moderate because diversity of the plant communities could be reduced and noxious weeds could be increased (see Section 4.3.1 for descriptions of impact levels to vegetation). With successful revegetation efforts, these impacts could be reduced to low.

The low quality shrub-steppe areas have a history of heavy disturbance and have high percentages of non-native invasive species. Impacts to these areas would generally be low, although in some areas impacts could be moderate because density of weed species could be increased and some native species could be removed where they are already a minor component.

Small amounts of riparian and upland forests would be removed for line clearance purposes, a moderate impact. No agricultural lands would be impacted. Options 1 and 2, associated with the Sickler-Schultz Reroute, would cross different areas of Wilson Creek. Both areas have similar vegetation, however, none would need to be removed since the line would span the trees with adequate electrical clearance.

Reminder

Federally listed, proposed, or candidate species *are species designated or in the process of being designated under the Endangered Species Act as endangered or threatened.*

Federal species of concern *are species that may be rare or declining, but are not formally listed under the ESA.*

Basalt lithosols *are soils with very high rock content.*

There are no known occurrences of ***federally listed, proposed, or candidate species*** along Segment A. Two species with potential habitat along Segment A are Ute ladies'-tresses and Wenatchee Mountains checker-mallow. No populations of either species were found within the proposed alignment, and because suitable wetland habitats would be avoided there would be no direct impact to these species.

Two populations of Hoover's tauschia, a ***federal species of concern***, were located adjacent to the proposed ROW in ***basalt lithosols***. In addition, populations of longsepal globemallow and Suksdorf's monkey-flower were located in the immediate vicinity (within 500') of the project area. If impacts cannot be avoided, it would be a moderate impact (if impacts could only be partially lessened by mitigation) or a low impact (if more successful mitigation is implemented). No BLM special status species were located on BLM managed land on Segment A.

4.3.3.2 Segment B

The Preferred Alternative would only use Option B_{SOUTH} of Segment B. Option B_{NORTH} would not be used.

Option B_{SOUTH} – The vegetation of Option B_{SOUTH} is almost all shrub-steppe, with several small areas of riparian vegetation. The shrub-steppe vegetation along this segment is all moderate to high quality shrub-steppe. Construction impacts to this area would be moderate. There are no high quality plant communities tracked by WNHP in Option $B_{SOUTH.}$ No agricultural lands are crossed on Segment B.

There are no known occurrences of federally listed or candidate species along Option B_{SOUTH}. The floodplain of the Columbia River is potential habitat for northern wormwood (Candidate species) and Ute ladies'-tresses (Threatened species). Surveys of the area did not locate populations of northern wormwood or Ute ladies'-tresses. Wetlands and the area immediately adjacent to the Columbia River would be avoided, thus there would be no impact to these species or their habitat.

Populations of the state Sensitive species tufted evening-primrose and desert cryptantha are located along an access road for the proposed transmission line ROW on YTC lands. If impacts to these species could not be avoided, it would constitute a moderate level of impact. Impacts could possibly be reduced to a low level with mitigation. A small occurrence of a single plant of gray cryptantha was known from the ROW area on YTC. No plants were located during searches of the area in May, 2002.

Option B_{NORTH} – The vegetation of Option B_{NORTH} is almost all shrub-steppe, with several small areas of riparian vegetation. The shrub-steppe vegetation along this segment is all moderate to high quality shrub-steppe. Construction impacts to this area would be moderate. There are no high quality plant communities tracked by WNHP in Option $B_{NORTH.}$ No agricultural lands are crossed on Segment B.

Potential habitat for northern wormwood (a candidate species) and Ute ladies'-tresses (a Threatened species) occurs in the floodplain of the Columbia River. Because structures would be placed well outside the habitat area for this species, there would be no impacts. There is no potential habitat for other federally listed, proposed, or candidate species.

Occurrences of the federal species of concern Columbia milk-vetch and the state sensitive species tufted evening-primrose are known to occur in the immediate vicinity (within 500') of the project area. If impacts could not be avoided, a moderate level of impact would occur if full mitigation could not be implemented. Impacts could be reduced to a low level if mitigation is successful.

In general impacts to Option B_{NORTH} would be very similar to those described to Option B_{SOUTH}, because the vegetation communities are similar.

4.3.3.3 Segment D

The vegetation of Segment D is roughly evenly divided between agricultural lands, low quality shrub-steppe and moderate-high quality shrub-steppe.

No impacts to native plant communities are expected in agricultural lands because only small remnants of native vegetation remain.

No impacts to riparian plant communities are expected because no access roads or towers would be built within riparian areas.

Impacts to moderate-high quality shrub-steppe would be moderate because the density of noxious weeds could be increased and the diversity of native vegetation could be reduced. With successful revegetation, this impact could be reduced to low. Impacts to low quality shrub-steppe would be low to moderate.

The WNHP high quality plant community bitterbrush/Indian ricegrass occurs along 0.8 mile of Segment D. Permanent impacts to this community caused by removing vegetation for structures or roads would be a high level of impact. Degradation of this community through a decrease in diversity, degradation of the physical environment, or an increase in non-native species would be a high level of impact.

A known occurrence of Umtanum desert buckwheat, a federal candidate species, is located near Segment D on part of Umtanum ridge. The proposed project passes near the population, although the nearest individuals of the population are over 750 feet east of the centerline of the project. The nearest individuals are approximately 35 feet from an existing access road, which will be improved for the project. Mitigation measures would be implemented to reduce the potential for impacts on the Umtanum desert buckwheat occurrence.

Wetlands are potential habitat for Ute ladies'-tresses (federally threatened species). The floodplain of the Columbia River is habitat for northern wormwood (candidate species) and Ute ladies'-tresses. Rare plant surveys of the area did not locate populations of Ute-ladies' tresses or northern wormwood. Wetlands and the area immediately adjacent to the Columbia River would be avoided, and there would be no impact to these species.

Portions of populations of three federal species of concern occur within the proposed ROW along Segment D: Columbia milk-vetch, gray cryptantha, and Hoover's desert parsley. One other federal species of concern, persistent sepal yellowcress occurs within the immediate vicinity of Segment D. In addition, portions of a population of the state sensitive species Piper's daisy and tufted evening-primrose occur within the proposed ROW. If impacts to these species cannot be avoided, it would constitute a moderate level of impact. Impacts could be potentially reduced to a low level through mitigation.

Approximately 3 miles of BLM-managed land is located within Segment D. Portions of two occurrences of the BLM special status species gray cryptantha and Hoover's desert-parsley occur within the ROW of the proposed project. In addition, an occurrence of Nuttall's sandwort is located in the immediate vicinity (within 500') of the project area. If impacts to these species cannot be avoided, it would be a moderate level of impact. Impacts could be reduced to a low level if successful mitigation is implemented. Mitigation could include placement of structures and roads to avoid populations, timing restrictions, or transplantation, if feasible.

In the area of the new Wautoma Substation, all vegetation would be permanently removed from an area 850 by 500 feet in size. Because this area is grassland dominated by non-native species with no occurrences of rare species, building the substation would be a low level of impact to vegetation.

Impacts to shrub-steppe and grassland communities along Segment D would be moderate to low.

4.3.3.4 Fiber Optic Line

Native vegetation along the Vantage Columbia fiber optic line includes shrub-steppe and small amounts of riparian vegetation. Large areas of orchards and other agricultural areas are crossed as well. There are no high quality plant communities tracked by WNHP along the fiber optic line. Impacts to shrub-steppe plant communities would be low to none because existing access roads would be use to install the fiber optic cable and most of them are already heavily disturbed. The riparian areas crossed by the project are generally composed of a mix of introduced and native species, because they were formed recently as a result of the Columbia Basin irrigation project and do not have high value. Impacts to these areas would be low to none since no construction would occur within them.

Since the fiber optic line will be located on an existing transmission line and existing access roads will be used for installation, no formal rare plant surveys were needed. A field reconnaissance of the fiber optic line documented several rare plant species, including the state sensitive species Geyer's milk-vetch, gray cryptantha, and beaked spike-rush. No impacts to these species would occur.

There are no known occurrences of federally listed or candidate species along the fiber optic line. The wetlands in the vicinity of the Vantage Substation and in the Quincy Lake Wildlife Area have potential habitat for Ute ladies'-tresses (Threatened species). Reconnaissance of these areas did not locate populations of Ute ladies'-tresses. Disturbance of wetlands in these areas would be avoided, thus there would be no impact to this species or its habitat.

The fiber optic loop near the proposed Wautoma Substation would be attached to existing towers and would have only temporary disturbances to agricultural and shrub-steppe lands from three reeling sites. No permanent impacts to shrub-steppe or sensitive species would occur.

Reminder

Impacts to vegetation from Segment A include:

- *No impact to T&E species*
- *Moderate to low impact to shrub-steppe and grassland communities*
- *High impact to Wyoming big sagebrush/bluebunch wheatgrass plant community*

4.3.4 Alternative 1

Impacts to vegetation along Segments A and B and the fiber optic line would be the same as described for the Preferred Alternative. (See Section 4.3.3.1, *Segment A*.)

4.3.4.1 Segment E

Vegetation within Segment E that would be impacted is mostly shrub-steppe and agricultural lands, with some riparian areas. Impacts to shrub-steppe communities would be moderate because the density of noxious weeds could be increased and the diversity of native vegetation could be reduced. With successful revegetation, these impacts could be reduced to low.

The WNHP tracked high quality plant community bitterbrush/Indian ricegrass shrubland is found along a 2.8-mile stretch of Segment E. Permanent impacts caused by removing vegetation for structures or roads would result in a high impact. Degradation of the community through a decrease in diversity, degradation of the physical environment, or an increase in non-native species would have a moderate impact.

There are no documented occurrences of federally listed species along Segment E, however, wetlands along Lower Crab Creek and in the valley are potential habitat for Ute ladies'-tresses and the Columbia River floodplain is habitat for northern wormwood and Ute ladies'-tresses. Because wetlands and the area immediately adjacent to the Columbia River would be avoided, there would be no impact to these species.

There are 4.9 miles of BLM managed land within Segment E, across the Saddle Mountains. No BLM special status species have been identified in the proposed alignment of Segment E. BLM special status species with the potential to occur in this area include gray cryptantha, Wanapum crazyweed, Geyer's milk-vetch, bristle-flowered collomia, blue cup, Nuttall's sandwort, Piper's daisy, Canadian St. John's wort, tufted evening-primrose, and the lichen species *Texosporium sancti-jacobi*. If impacts to BLM special status species could not be avoided, it would be a moderate level of impact. Impacts could be partially lessened by mitigation.

Occurrences of two federal species of concern: Hoover's desert-parsley and gray cryptantha and the state sensitive species Suksdorf's monkey-flower are known to occur in the immediate vicinity (within 500') of the project area. If impacts to these species could not be avoided, this would constitute a moderate level of impact. Impacts could be reduced to a low level with mitigation.

4.3.5 Alternative 3

Impacts to Segment A and the fiber optic line would be the same as described for the Preferred Alternative. (See Section 4.3.3.1, *Segment A*.)

4.3.5.1 Segment C

Native vegetation along Segment C that would be impacted is almost entirely shrub-steppe, with some limited riparian vegetation. Impacts to shrub-steppe and grassland plant communities would be moderate to low. Impact to riparian areas would be moderate. There are no high quality plant communities tracked by WNHP in Segment C.

There are no known occurrences of federally listed or candidate species along Segment C. Some structures might be located on basalt cliffs within Segment C, which could provide habitat for basalt daisy (federal candidate species). If basalt daisy is present and habitat areas could not be avoided, this would be a moderate to high level of impact, depending on whether mitigation can be implemented.

Columbia milk-vetch, a federal species of concern occurs in the immediate vicinity (within 500 feet) of the Segment C route. This species could be impacted by construction activities. If this species could not be avoided, it would constitute a moderate level of impact if full mitigation could not be implemented, or a low level if fully mitigated.

A small amount of BLM managed land (less than 0.25 mile) is located within Segment C. There are several known occurrences of BLM special status species within the general area of the proposed ROW. Impacts to BLM special status species would be a moderate level of impact if the impacts could only be partially lessened by mitigation or a low level if successful mitigation is implemented.

Impacts at the new Wautoma Substation would be the same as discussed in the Preferred Alternative (Section 4.3.3.3).

➡ Reminder

Impacts to vegetation along Segments A and B include:

- *No impact to T&E species*
- *Moderate to low impact to shrub-steppe and grassland communities*
- *High impact to Wyoming big sagebrush/bluebunch wheatgrass plant community*

4.3.6 Alternative 1A

Impacts to vegetation along Segment A and the fiber optic line would be the same as described for the Preferred Alternative. (See Section 4.3.3.1, *Segment A*), and impacts to Segment B (Option B_{NORTH}) would be the same as described for Alternative 1. (See Section 4.3.4.1, *Segment B*.)

4.3.6.1 Segment F

Vegetation within Segment F that would be impacted is almost all shrub-steppe with some agricultural land. Impacts to shrub-steppe communities would be moderate because of the risk of introducing non-native vegetation and reducing the diversity of the native vegetation.

As in Segment D, a bitterbrush/Indian ricegrass shrubland, a high quality plant community tracked by WNHP, occurs along 0.8 mile of Segment F. Impacts would be high to moderate, as discussed in Segment D.

There are no known occurrences of federally listed or candidate species along Segment F. Similar to Segments D and E, wetlands along Lower Crab Creek and in the valley are potential habitat for Ute ladies'-tresses, and the Columbia River floodplain is habitat for northern wormwood and Ute ladies'-tresses. Because wetlands and the area immediately adjacent to the Columbia River would be avoided, there would be no impact to these species.

The federal species of concern Hoover's desert parsley and the state threatened species dwarf evening-primrose, occur in the vicinity of the proposed line. The lichen species *Texosporium sancti-jacobi* (federal species of concern) could also occur in this area. If impacts to these species could not be avoided, it would constitute a moderate level of impact. Impacts could be reduced to a low level with mitigation.

There are 12.8 miles of BLM managed land within Segment F, along the south slope of the Saddle Mountains. Known occurrences of the BLM special status species, Hoover's desert-parsley and dwarf evening primrose are in the immediate vicinity (within 500 feet) of Segment F and could be impacted by project activities. Other BLM special status species with the potential to occur in this area include gray cryptantha, Wanapum crazyweed, Geyer's milk-vetch, bristle-flowered collomia, blue cup, Nuttall's sandwort, Piper's daisy, Canadian St. John's wort, tufted evening-primrose, and the lichen species *Texosporium sancti-jacobi*. If impacts to BLM special status species could not be avoided, it would be a moderate level of impact. Impacts could be partially lessened by mitigation.

4.3.7 No Action Alternative

The impacts currently associated with ongoing maintenance activities for the existing transmission line, substations, and ROW would continue. These impacts include localized soil disturbance due to vehicular traffic, transmission structure replacement, vegetation management activities, and access road improvements. No new impacts to vegetation are expected as a result of this alternative.

4.3.8 Recommended Mitigation

4.3.8.1 Site-Specific Surveys

To determine whether rare species occur along the Preferred Alternative (A, B_{SOUTH} and D), a rare plant survey was undertaken. Rare plant surveys were initiated in August 2001 and occurred between April and July in 2002. A professional botanist skilled at identifying plants in the Columbia Basin was retained to conduct rare plant surveys during the correct time of year to identify the species with the potential to occur in each area. The survey was sufficiently detailed to ensure that if rare species were present, they were likely to be found. When rare plant species were found, the boundaries of the occurrence were accurately mapped on aerial photographs and located by **GPS** so they could be accurately depicted on project maps. For a complete discussion of the rare plant survey and methodology. (See Appendix F, *Rare Plant Survey for the Preferred Alternative*.)

Reminder

GPS*: Global Positioning Systems*

4.3.8.2 Native Plant Communities

Impacts to native plant communities would be minimized during construction by implementing the following practices:

- Construction activities would be restricted to the area needed to work effectively including streams and designated access roads. Construction crews would be instructed to restrict vehicles to designated areas.
- Designated areas would be used to store equipment and supplies. The contractor would follow state and federal regulations to protect plant communities.
- In areas identified by the project botanist where populations of state or federal listed sensitive species occur, topsoil would be stockpiled when the footings of structures are put in place or an area for placement of a structure is graded. After construction, the topsoil would be replaced on the surface of the soil and the surface would be restored to the former grade, where possible.
- After construction, disturbed areas not needed for ongoing access or maintenance would be reseeded.
- Construction specifications would designate which species are appropriate for reseeding in certain areas. Inquiries have been made to determine which commercially available native seed has been used with some success, and recommended strategies would be followed.
- Continue to coordinate with state and federal agencies on providing cumulative mitigation for permanent impacts to shrub-steppe habitat.

4.3.8.3 Rare Species

Rare plant species habitat would be avoided if possible and unavoidable impacts would be minimized as much as possible. Structures and roads would be placed to avoid impacting rare species occurrences if possible. Impacts to rare species would be minimized during construction and subsequent maintenance, by implementing the following practices:

- Boundaries of rare species populations that may be impacted would be flagged in the field with an appropriate buffer, to ensure they are not impacted during construction.
- If impacts are temporary, it may be sufficient to restrict the time of year that various activities take place. Many plants in the study area flower and fruit very early in the spring, then remain dormant under the ground for much of the year. The underground parts may not be disturbed during dormancy by certain types of minimal activities, such as driving through an area.
- Information on rare plant species occurrences would be given to BPA maintenance personnel to be considered during the planning

and implementation of future maintenance activities. The location of rare plant occurrences would be placed on BPA maps and documents so that maintenance personnel are aware of their location. A written description of restrictions, precautions, or special procedures within rare plant habitat would be attached to maps and documents for that area.

- On state and federal land where rare plants are known to occur, the procedures used to control weeds would be restricted to those that minimize harm to rare plant species. The decision on the best actions to take to control weeds would be made on a case-by-case basis with consultation with the respective state or federal land manager.

To minimize the potential for impacts to the Umtanum desert buckwheat, the following measures would be implemented:

- Construction fencing would be installed along the access road closest to the population to discourage travel through the population.
- At least three permanent signs between the access road and the population of Umtanum Desert buckwheat would be placed which say "Sensitive Ecological Area. Please Do Not Enter."
- Approximately 1500 feet of three-strand fencing would be installed and maintained along the access road near Midway Substation to prevent unauthorized access to the Hanford Monument.
- A tubular style gate would be installed on the access road intersection near Midway Substation. This gate would be locked at all times with a security chain.
- A tubular style gate would be installed on the access road at the southern border of Hanford Monument lands. This gate would be locked at all times with a security chain.
- Construction activities on the Hanford Monument land south of the Columbia River would take place primarily in winter or early spring when fire danger is lowest. Construction at other times would follow fire control measures. (See Section 4.11.5, *Fire*).
- Construction would slow down during extremely wet conditions when vehicle or equipment travel would create ruts greater than four inches deep.
- Additional plant surveys will be conducted in spring 2003 on all identified disturbance areas including road ROW, reeling stations, tower assembly areas, tower footing locations and staging areas within the Hanford Monument

- Weed management on access roads and other mitigation measures mentioned above on Hanford Monument would be coordinated with Monument staff to minimize effects to Umtanum Wild Buckwheat and other rare plant species.
- A vehicle wash station will be placed at the entrance to Umtanum Ridge to remove weed seeds from vehicles and equipment.

4.3.8.4 Minimize the Introduction and Spread of Weeds

Throughout the project, efforts would be made to minimize the introduction or spread of weeds, by implementing the following activities and practices. These activities and practices would be included in a Weed Management Plan for this project:

- To determine the extent of the weed problems along the Preferred Alternative, a pre-construction weed survey was undertaken to document current conditions.
- Some weed control and eradication activities may occur prior to construction in selected areas if construction would exacerbate an existing weed problem.
- After construction, the seeding of disturbed areas with Hanford- or Columbia Basin-derived native seed mix would help decrease weed invasion by providing competition for space.
- A post construction weed survey would be done so that pre- and post-construction weed distributions can be compared. If weed problems exist or are increasing over pre-construction conditions, BPA would cooperate with county weed boards or federal land management agencies to eradicate or control any species that invade disturbed areas.
- To control weeds, BPA would use the procedures outlined in the BPA's *Transmission System Vegetation Management Program Record of Decision* (August 2000) to address weed problems in subsequent maintenance activities.
- Off-road travel would be minimized such as that necessary for turning equipment and vehicles around or parking and staging equipment. In these areas, construction crews would be instructed to crush vegetation in place to accomplish vehicle turnaround, rather than clearing it with equipment. This would help avoid soil compaction, reduce the area requiring revegetation, and reduce the potential for noxious weed spread.
- Mitigation measures would be required to ensure equipment used on the project does not introduce or spread invasive species seeds on- or off-site.

Reminder

This document is available for review on the Web at: *http://www.efw.bpa.gov/cgi-bin/PSA/NEPA/SUMMARIES/VegetationManagement_EIS0285*.

- Because weeds can be spread by vehicles, BPA would restrict access to the newly constructed access roads where possible, by using gates.
- Vehicles will be inspected for noxious weeds prior to entering the Columbia National Wildlife Refuge and, if any are found, will be removed prior to entry.

4.3.9 Cumulative Impacts

The loss of shrub-steppe may result from a myriad of projects within the Columbia Basin that involve clearing land and converting it to other uses. The loss of shrub-steppe in Washington State attributable to agriculture has been estimated at 60 percent (Dobler, 1992, Columbia Basin Ecosystem Management Project, EOE-RL, 1996). Due to the high value of some agricultural lands in the study area, the loss of shrub-steppe has accelerated. Within the study area, the ***DNR*** continues to offer leases to state-owned lands for agricultural uses. In Washington, the continued loss of shrub-steppe in the next 50 years is projected to be high (Andelman and Stock, 1994).

Reminder

Cumulative Impacts *are created by the incremental effect of a specific action when added to other past, present, or reasonably foreseeable future actions.*

DNR*: Washington State Department of Natural Resources*

Impacts to rare plant species on federal lands may occur due to land use such as grazing or training exercises, but it likely that federal agencies will prioritize the protection of rare species habitats. Much of the rare plant species habitat managed by federal agencies within the study area is relatively inaccessible. Environmental documents produced by these agencies address the needs of rare plant species and staff members are assigned to deal with rare plant issues.

Rare plant species in private areas receive little to no protection under federal and state rare and endangered species legislation and regulations. Rare species may be impacted by a variety of land uses typical of private lands, including farming, ranching and development.

The project could contribute to the spread of weeds in the study area because of ground disturbance. The invasion by weeds is considered one of the biggest threats to biodiversity in the study area (TNC, 1999). Continued invasion by weed species could accelerate as development occurs and as new weed species invade the area.

County planning staff were contacted to determine if any land use developments were currently planned or underway near the preferred alternative that would disturb significant areas of shrub-steppe and could contribute cumulatively to shrub-steppe habitat loss. Aside from individual residential and other small private development, the counties identified no projects near the proposed project.

4.4 Wildlife

4.4.1 Impact Levels

Reminder

*A **take** is to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct.*

*To **harm** is to injure directly or cause significant habitat modification or degradation that results in death or injury to a species.*

High impacts would occur when an action creates a significant adverse change in wildlife habitat, populations, or individuals. High impacts may result from actions that:

- cause the ***take*** of a federally listed or proposed threatened or endangered wildlife species.
- cause a significant reduction in the population, habitat or viability of a federal or state listed wildlife species of concern or sensitive wildlife species, which would result in trends towards endangerment or the need for federal listing.
- cause a significant long-term (more than two years) reduction in the quantity or quality of habitat critical to the survival of local populations of common wildlife species.
- ***harm*** or kill a significant number of individuals of a common wildlife species.

Moderate impacts would occur when an action creates a moderate adverse change in wildlife habitat, populations or individuals. Moderate impacts may result from actions that:

- create an effect on federally listed or proposed threatened or endangered wildlife species that could be partially mitigated.
- cause a reduction in the population, habitat or viability of a federal or state listed wildlife species of concern or sensitive wildlife species, without resulting in trends towards endangerment or the need for federal listing.
- harm or kill a small number of individuals of a common wildlife species.

Low impacts would occur when an action creates a minor adverse change in wildlife habitat, populations or individuals. Low impacts may result from actions that:

- create an effect on federally listed or proposed threatened or endangered wildlife species that could be largely or completely mitigated (i.e., seasonal restrictions on construction activities) or are temporary and benign (i.e., temporary disturbance by construction noise).
- cause a minor short-term (less than two years) reduction in the quantity or quality of the habitat of a federal or state listed wildlife species of concern or sensitive wildlife species, without resulting

in trends towards endangerment and/or the need for federal listing.

- cause a significant short-term (less than two years) reduction in the quantity or quality of habitat critical to the survival of local populations of common wildlife species.

Minimal impacts would occur when an action creates a temporary or minor adverse change in wildlife habitat or individuals. Minimal impacts may result from actions that:

- cause a temporary (less than two weeks) disturbance or displacement of a federal or state listed wildlife species of concern or sensitive wildlife species.
- cause a short-term (less than one year) disturbance or displacement of a common wildlife species.

No impacts would occur when an action has no effect or fewer impacts than the minimal impact level on wildlife habitat, populations or individuals.

4.4.2 Impacts Common to Construction Alternatives

The construction, operation, and maintenance of the proposed transmission line would impact wildlife populations residing in or near the proposed study area. The extent of impact would depend on the species, habitat requirements, and availability of suitable habitat in and around the construction and ROW area. Construction impacts can be generally categorized as short-term disturbances related to construction and its associated noise, dust, and human intrusion. Impacts from operation and maintenance of the project are categorized as long-term impacts, and can include impacts from physical habitat changes, harm to individual animals from the existence of the structures, or ongoing disturbance from periodic maintenance activities.

4.4.2.1 Impacts to Riparian, Open Water, and Wetland Species

Species associated with riparian areas, open water, and wetlands that could be adversely affected by the proposed project can be broken into four broad categories, including: 1) waterfowl, 2) perching and cavity-nesting birds such as bald eagles, osprey, herons and woodpeckers, 3) bats, 4) mammals such as mice, raccoons, weasels, coyote, deer and elk, and 5) herpetofauna (reptiles and amphibians). These species could be found along the streams and associated wetlands of all segments, and in and along the Columbia River and on Saddle Mountain Lake. Impacts to these five categories of species associated with these areas are described below.

1) Waterfowl and other birds closely associated with water (including ducks, geese, cormorants, terns, gulls and pelicans) could be affected by the proposed project where it crosses the Columbia River, Crab Creek, and Saddle Mountain Lake. Some of these species may also be present in some of the smaller streams and wetlands of the project area. Short-term impacts to these species would be limited to disturbance from noise and human presence during construction (a low impact, or high impact if nesting waterfowl were present) and some limited nesting and cover habitat removal (moderate impact) from riparian vegetation clearing. Long-term impacts to waterfowl from the operation of the transmission line system would be moderate, due to the presence of the transmission line, which creates an additional obstacle across their preferred habitat that these species may collide with, leading to injury or death. (See Section 4.4.2.3.)

2) Perching and cavity-nesting birds use large trees that are generally only found within the study area along riparian corridors. Ospreys and bald eagles are highly dependent on larger trees for roosting, perching, and nesting. Herons may use these trees for roosting and perching and prefer large trees for nesting. Cavity-nesting birds such as woodpeckers, owls, and smaller birds like chickadees use these trees for nesting and foraging. Short-term impacts include general construction disturbance from noise and human presence (low-moderate impact to these species) and clearing of riparian vegetation that could directly disturb or remove habitat for these species, a high impact. Long-term impacts could include the permanent reduction in large tree habitat (high impact) and an increased risk of collision with transmission line towers, conductors, or overhead ground wires (moderate impact).

3) Bat species are present along the route in all areas but may concentrate along water courses and the shrub-steppe interface with riparian areas because these areas generally contain more insects, a primary prey item for bats. Few studies have been done about the impact to bats from transmission line or construction practices. Project construction could impact bats through the clearing of larger riparian vegetation that bats use as roosting areas; however, general construction-related disturbance would have no effect on bats. Tree felling could directly injure or kill bats that are roosting (moderate-high impact). Long-term impacts to bats would be from a reduction in suitable roosting habitat if large riparian trees are removed and the increased hazard of bats colliding with structures, conductors, or overhead ground wires. Little information is available on the effect that these structures and their associated EMF has on bat echolocation and avoidance. Absent relevant information, it should be assumed that risks to bats from transmission line presence will be similar to those for waterfowl and other bird species (moderate).

4) Small mammals such as mice, voles, gophers, raccoon, skunk, and others may often live their entire lives in and around riparian and stream areas. Larger mammals such as coyotes, mule deer, and elk may use streams only at certain times of the day or year for forage, cover, or water. All of these species are mobile and not entirely dependent on riparian vegetation for survival. Short-term impacts from construction noise and disturbance would have a low impact to these species, because they could quickly move away from the area. Long-term impacts from removal of riparian vegetation would be low because only a portion of these species' habitat would be removed and they could relocate into adjoining suitable habitat.

5) Reptiles and amphibians (herpetofauna) that inhabit open water, wetland, or riparian habitats could include such species as spotted frogs, leopard frogs, Woodhouse's toads, salamanders, rattlesnakes, and other snake species. Short-term impacts to these species could include general disturbance from construction noise and human presence (low impact) or mechanical crushing from construction equipment (high impact). Because construction would not occur in most open water and wetland areas, these species are not expected to be more than minimally impacted. Removal of riparian vegetation could remove some habitat components for theses species, but will not completely remove it in the cleared areas.

Although the riparian, wetland, and open water habitats along the different line segments are used by a large number of species and are considered unique habitat types in the region, the overall impacts to various species associated with these areas would generally be moderate to low. Towers would be placed outside of these sensitive areas and existing access road crossings would be used in most cases. Some clearing of riparian vegetation would take place for line clearance purposes, but would be limited to taller trees that lie within the ROW. Also, mitigation measures would be implemented (See Section 4.4.10) that would help reduce the potential for adverse impacts to species associated with open water, wetland, and riparian areas.

4.4.2.2 Construction Impacts to Shrub-Steppe Species

By far the greatest impacts to wildlife species from the proposed alternatives would be construction in shrub-steppe habitat. The majority of the project is within this habitat type. Species associated with shrub-steppe habitat that could be adversely affected by the proposed project can be broken into five broad categories, including: 1) migratory birds and raptors such as hawks and eagles, 2) sagebrush-dependent birds, such as sage grouse, sage sparrow, and sage thrasher, 3) medium and large mammals, 4) small burrowing species such as rabbits and ground squirrels (also includes burrowing owls), and 5) herpetofauna (reptiles and amphibians). These species could be found along all of the project alternatives.

1) Raptors and migratory birds that could be adversely affected by the proposed project include eagles, hawks, falcons, songbirds, bluebirds, and other species. Short-term construction impacts would be limited to general disturbance from construction equipment and human presence, as these species are mobile. Long-term impacts could occur from the increased risk of collision with transmission line towers, conductors and overhead ground wires, a moderate impact. (See Section 4.4.2.3.) Some raptor species may benefit from the project because new perching sites would be established and clearing of sagebrush could make small mammal prey species more easily available.

2) Bird species dependent on sagebrush for major parts of their lifecycle include sage grouse, sage sparrow, sage thrasher, loggerhead shrike, and long-billed curlew. These species above all others could be severely affected by both short- and long-term impacts. Short-term impacts from construction noise and disturbance could be enough to drive these species from their habitual breeding and nesting areas, causing a reduction in numbers of offspring (high impact). Individual nests could be destroyed by construction equipment, also a high impact. Long-term impacts could occur from habitat fragmentation and invasion of non-native weed species (high impact). Many of these species such as sage sparrows, sage thrashers and sage grouse need large unbroken expanses of sagebrush to successfully rear offspring. Disruption of existing unbroken tracts of sagebrush can reduce available habitat, create avenues for predator species, and allow the spread of invasive species that reduce forage species and may be more susceptible to fire. Even if revegetation is successful, it would be years before the sagebrush grows back enough to mimic pre-construction conditions, so the impacts from habitat fragmentation will continue for some time after construction is complete. In areas of degraded shrub-steppe vegetation (e.g., vegetation infested with weed species), clearing would constitute a moderate or low impact to these species, because the habitat is already degraded. Clearing in areas previously cleared or severely disturbed (such as agricultural lands) would result in minimal impacts to these species. The presence of the project may increase the risk of collision for these species (moderate impact), although most of the alignments follow existing transmission lines so the risk would not be as high in these areas as in areas where a new line placed where none previously existed nearby.

3) Medium and large mammals present in shrub-steppe habitat in the project area could include, deer, elk, coyote, bighorn sheep, badger, and others. Because these species are highly mobile, short-term impacts would be limited to disturbance from noise, dust, and human intrusion (low impacts), or mechanical crushing of species that burrow such as badgers (moderate impact). Long-term impacts resulting from a reduction in browse species from conversion of native sagebrush, grasses, and forbs to invasive weed species could affect ungulates if revegetation efforts are unsuccessful. However, these impacts would generally be low, because there are large areas of suitable forage surrounding the proposed project area. Ongoing maintenance activities would slightly increase the amount of disturbance to theses species (low impact).

4) Small burrowing mammals and birds such as Washington ground squirrels, voles, kangaroo rats, pygmy rabbits, burrowing owls, and others have the highest potential for disturbance from construction because they live in burrows that could be subjected to mechanical disturbance and they are less mobile than bird or large mammal species. These species are generally limited to areas of deep soils, and consequently would not be found in all project locations. Short-term impacts would generally be high for populations that are within the construction areas. Impacts could result from mechanical disturbance or crushing of burrows; removal of sagebrush, an important source of cover and browse for these species; and general disturbance from construction equipment and human presence. Long-term impacts resulting from a reduction in browse and cover species from conversion of native sagebrush, grasses, and forbs to invasive weed species could affect these species. These impacts would generally be high, as high-quality native shrub-steppe is scarce and many of these species are rare. Some species such as ground squirrels and mice may suffer higher mortality rates because they will have less cover available to protect them from raptors or owls (moderate-high impacts). Soil compaction from heavy equipment and road construction could also impact burrowing species by reducing the amount of soft soils they could use for burrowing (moderate impact). Operation of the project and ongoing maintenance activities will not affect these species except for minor temporary disturbance from vehicles, because all activity will take place on access roads.

5) Herpetofauna present in the shrub-steppe areas include rattlesnakes, gopher snakes, nightsnakes, whipsnakes, sagebrush lizards, Western fence lizards, and others. These species are present in many habitats and are not as dependent on undisturbed shrub-steppe as some bird and mammal species. However, they are less mobile and their home ranges are small, so even localized

disturbances could have high impacts. Short-term construction-related disturbance could impact herpetofauna species from crushing or mechanical injury (moderate-high impact). Construction-related noise and human intrusion generally would not impact these species past the immediate construction area. Long-term impacts would be related to the removal of cover species such as sagebrush and the fragmentation of habitat associated with roads and cleared areas. Removal of cover creates opportunities for predators such as raptors, owls, and coyotes to more easily find these prey species. Large cleared areas such as roads could create barriers to these species' movements by eliminating sources of cover. This could limit dispersal and access to critical habitat elements for some species (moderate-high impacts).

4.4.2.3 Operation and Avian Collision Impacts

Operation of the proposed project would have the greatest impact on bird species, due to the collision threat posed by structures, transmission lines, and ground wires. Most other wildlife species would not be as significantly impacted, as the presence of the transmission lines, structures, and access roads generally does not present barriers to migration, create excessive noise, or otherwise cause major behavior changes. Some species with small home ranges or limited dispersal ability might experience a greater negative impact. The risk of electrocution to perching and migratory birds has been minimized over the years by designing towers, insulators, and conductors to account for the behavior of different bird species (especially raptors) as they perch or attempt to nest on different parts of the towers and conductors. These design changes have led to a significantly reduced risk of bird mortality from electrocution. These designs have been incorporated into all of the towers, insulators, and conductors specified for the proposed project.

Some bird species, usually waterfowl, are prone to collisions with powerlines, especially the grounding wires located at the top of the structures (Meyer, 1978, James and Haak, 1979, Beaulaurier, 1981, Beaulaurier et al., 1982, Faanes, 1987). Four main factors influence avian transmission line collisions: the current level of risk, power line configuration, amount of bird use in a particular area, and the tendency of certain bird species to collide with wires. Collisions usually occur near water or migration corridors and more often during inclement weather. Raptor species are less likely to collide with power lines, perhaps due to their excellent eyesight and tendency to not fly at dusk or in low visibility weather conditions (Olendorff and Lehman, 1986). Smaller migratory birds are at risk, but generally not as prone to collision because of their small size, their ability to quickly maneuver away from obstacles, and the fact that they often migrate high enough above the ground to avoid transmission lines. Permanent-resident birds that fly in tight flocks, particularly those in wetland areas, may be at higher risk than other species.

4.4.3 Preferred Alternative (Alternative 2)

The Preferred Alternative would include Segment A, Segment B (Option B_{SOUTH}), Segment D and the fiber optic line.

4.4.3.1 Segment A

Along Segment A, approximately 70.25 acres of shrub-steppe would need to be temporarily cleared for construction access and approximately 20.35 acres would need to be permanently removed for structure sites and access roads. Approximately 0.20 acres of forest vegetation, including some riparian vegetation, would need to be temporarily cleared for access roads and tower locations.

Riparian vegetation removal would constitute a high impact to wildlife, since riparian areas are scarce and provide important habitat to species such as bald eagles and Lewis' woodpeckers. Options 1 and 2, associated with the Sickler-Schultz Reroute, would cross different areas of Wilson Creek. Both areas have similar vegetation and wildlife habitat. There would be no impacts to wildlife from riparian vegetation removal since both crossings would span the vegetation with adequate electrical clearance.

Nesting habitat for sagebrush obligate species such as the sage sparrow and sage thrasher would be removed (high impact), as would known nesting habitat for long-billed curlew (moderate impact). Sharp-tailed grouse have been documented in the past near the west end of Segment A and, if they still exist, would be moderately impacted by vegetation removal. Sage grouse are known to exist in the southern end of this segment, although no occurrences have been documented closer than 1 mile from the proposed ROW. Disturbance to sage grouse from vegetation removal and construction noise may result from this project (high impact).

The increase in risk to raptors, waterfowl, and passerine bird species from collision with transmission lines and structures would be low, since no major migration corridors or bodies of water are located along this segment and the alignment parallels existing transmission lines for the entire length. If the project were constructed during the winter, the potential for disturbing roosting bald eagles (threatened species) would be high near the Wilson and Naneum Creek crossings (high impact).

Wintering deer and elk might be temporarily disturbed by the construction noise and activity (minimal impact). The increase in potential habitat for perching raptors may cause an increase in predation risk for shrub-steppe dependent animals, a moderate impact.

4.4.3.2 Segment B

The Preferred Alternative would follow Option B_{SOUTH} of Segment B. Option B_{NORTH} would not be used for this alternative.

Along Segment B (Option B_{SOUTH}), approximately 31.7 acres of shrub-steppe would need to be temporarily cleared for construction access and approximately 6.35 acres would need to be permanently removed for structure sites and access roads. No riparian vegetation would need to be cleared.

If the new line was constructed during the winter, the potential for disturbing roosting bald eagles (threatened species) would be moderate near the Columbia River crossing (moderate impact). In the upland areas, wintering deer and elk might be disturbed by construction activity (minimal impact). Sage grouse are known to exist near the western end of this segment and might be impacted (high impact). Nightsnakes have been observed near the proposed ROW and might be impacted (low impact). Near the Columbia River, waterfowl, pelicans, and other birds using the area as a migration corridor might be at increased risk of collision with the transmission line spanning the river (moderate impact).

Impacts to Option B_{NORTH} would be essentially the same as those described for Option B_{SOUTH} above, should that option be used.

4.4.3.3 Segment D

Segment D has the most varied terrain, and thus the most diverse group of habitats of all the proposed segments. Approximately 49.45 acres of shrub-steppe habitat would need to be temporarily cleared for construction access and approximately 17.35 acres would be permanently removed for structure sites and access roads. Segment D crosses Lower Crab Creek and the Columbia River, which are both migration corridors for birds and areas of high waterfowl concentrations. The risk of avian collisions would be increased in these areas, although the proposed line would be located adjacent to an existing line (moderate impact). The Saddle Mountains have documented occurrences of nesting prairie falcons and golden eagles that could be disturbed by construction activities (low impact). Other species in the Saddle Mountains include the striped whipsnake, chukar, passerine bird species, and a variety of small mammals.

Impacts to these species would be moderate, due to the removal of shrub-steppe and dwarf shrub-steppe plant communities.

Segment D crosses the Wahluke Slope over mostly agricultural lands, with no native shrub-steppe habitat present. Construction and operation of the project in this section of the proposed segment would have no impact on species that depend on shrub-steppe habitat and would have minimal to no impact on other wildlife species.

The southern third of Segment D crosses the Columbia River and climbs over Umtanum Ridge. On the steep north face of Umtanum Ridge, nesting prairie falcons and other raptor species have been documented. Swainson's hawks, loggerhead shrikes, and burrowing owls have all been documented nesting near or on the proposed ROW south of Umtanum Ridge. Clearing in this area would cause high impacts to burrowing owls and moderate impacts to other shrub-steppe-dependent species, because existing shrub-steppe vegetation is considerably disturbed. In addition, the southern end of the proposed line crosses the Cold Creek wildlife migration corridor, which is one of the most important bird migration corridors in Washington and an important corridor for wildlife migrating between the YTC and the Hanford Site. Disturbance to this area has the potential to disrupt the migration patterns of these species and increase the hazard of avian collisions with transmission lines and structures, although because the new transmission line would parallel existing transmission lines, impacts would be less than if a new line were installed separate from existing lines (moderate impact).

4.4.3.4 Fiber Optic Line

The proposed fiber optic line would follow an existing transmission line and would not require that new structures be built. There would be several pulling and reeling areas along the alignment where vehicles and equipment would need to be temporarily parked and some ground disturbance would be required. However, these areas would be limited to agricultural areas or roads where existing disturbance has occurred. Therefore, no native shrub-steppe or other vegetation would be removed as part of the fiber optic line installation. Disturbance would be limited to temporary noise and human presence from work at tower sites and vehicular travel along access roads. No impacts to wildlife species existing in shrub-steppe would be expected.

Where the fiber optic alignment crosses canyons or wetland and lake areas, bird strikes are a concern. Five areas along the fiber optic line have been identified as being at risk for bird strikes: Crab Creek, Sand Hollow Canyon, the lakes and wetland complex north of I-90, the Quincy Lakes Wildlife Refuge, Lynch Coulee and Moses Coulee. Spiral bird strike diverters would be placed along the fiber optic line in these locations to make the fiber optic line more visible to passing birds and reduce the chance of collision. Since the fiber optic line would be placed on an existing structure that birds are currently accustomed to, the potential impacts are only moderate to low, as opposed to high for an entirely new structure. The application of bird strike diverters in appropriate areas reduces the potential impact to birds from moderate to low.

The fiber optic loop near the proposed Wautoma Substation would be attached to existing towers and would have only temporary disturbances to agricultural and shrub-steppe lands from three reeling sites. No permanent impacts to shrub-steppe or wildlife species would occur from vegetation disturbance, however, the risk of bird strikes would increase. With the addition of bird strike diverters in the area over Yakima Ridge, the risks to birds would be low.

Reminder

Impacts to wildlife would be moderate to high along Segments A and B.

4.4.4 Alternative 1

Alternative 1 would include Segment A, Segment B (Option B_{SOUTH}), Segment E, and the fiber optic line between the Vantage and Columbia Substations.

Impacts to wildlife and wildlife habitat along Segments A, B, and the fiber optic line between Vantage and Columbia Substations would be the same as described for the Preferred Alternative. (See Section 4.4.3.1, *Segment A* and Section 4.4.3.2, *Segment B*).

4.4.4.1 Segment E

Along Segment E, approximately 63.50 acres of shrub-steppe would need to be temporarily cleared for construction access and approximately 12.45 acres would need to be permanently removed for structure sites and access roads. Approximately 0.85 acres of forest vegetation, including some riparian vegetation, would need to be temporarily cleared for access roads and tower locations.

Segment E crosses Lower Crab Creek and the Columbia River, which are both migration corridors for birds and areas of high waterfowl concentrations. The risk of avian collisions would be increased in these areas, although the proposed line would be located adjacent to an existing line (moderate impact). The Saddle Mountains have documented occurrences of nesting prairie falcons and golden eagles that could be disturbed by construction activities (low impact). Other species in the Saddle Mountains include the striped whipsnake, chukar, passerine bird species, and a variety of small mammals.

Impacts to these species would be moderate, due to the removal of shrub-steppe and dwarf shrub-steppe plant communities. The upper edge of the Wahluke Slope, just below the Saddle Mountain crest where the line heads southeast, has not been converted to agriculture and remains shrub-steppe. Construction in this area would cause a high impact to shrub-steppe-dependent species in this area such as sage thrashers and sage sparrows. The line crosses the remainder of the Wahluke Slope over mostly agricultural lands that have little native shrub-steppe habitat present. Construction and operation of a new line in this section of the proposed segment would have no impact on species that depend on shrub-steppe habitat, and minimal to no impact on other wildlife species. The project may have a low positive impact for raptor species due to an increase in nesting, perching, and roosting habitat.

The shrub-steppe habitat in the Hanford Site is relatively undisturbed, although some areas of invasive species are present due to past grazing practices. A herd of mule deer, uncommon in the central shrub-steppe region, is present in this area and may be temporarily disturbed by construction activity (low impact). Shrub-steppe-dependent species such as the sage sparrow would be disturbed by construction and habitat removal during clearing (high impact). Burrowing owls have been documented near the proposed line and may be impacted by clearing and construction (moderate impact). Raptors (including Swainson’s hawks) are present. A new line might have a low positive impact for raptors, because the towers are the tallest structures within many miles and make excellent perching habitat. However, the additional habitat available for perching raptors could increase the predation risk for small shrub-steppe dependent species such as sage sparrows, sage thrashers, mice, and voles, a moderate impact.

A large wetland complex called Saddle Mountain Wasteway, just west of Segment E, is home to great numbers of waterfowl, great blue herons, and other wetland species. The new line would cross a channel and the associated wetland complex leading east from the lake. Woodhouse’s toads have been documented in large numbers within this area and might be impacted (low impact). The proposed line would avoid the riparian area (minimal impact to riparian species), but increase the collision hazard for waterfowl and other bird species (moderate impact). The crossing over the Columbia River into the Hanford Substation would also increase the collision hazard for waterfowl and other bird species using the migration corridor (moderate impact).

4.4.5 Alternative 3

➡ Reminder

Impacts to wildlife would be moderate along Segment A.

Alternative 3 would include Segment A, C, and the fiber optic line.

Impacts to wildlife and wildlife habitat along Segment A and the fiber optic line would be the same as described for the Preferred Alternative. (See Section 4.4.3.1, *Segment A)*.

4.4.5.1 Segment C

Along Segment C, approximately 171.05 acres of shrub-steppe would need to be temporarily cleared for construction access and approximately 154.95 acres would need to be permanently removed for structure sites and access roads. Approximately 1.15 acres of forest vegetation, including some riparian vegetation, would need to be temporarily cleared for access roads and tower locations.

Sage grouse, burrowing owls, wintering bald eagles, and loggerhead shrike are all known to be present near the proposed ROW, and could be impacted by construction of the new line (high impact). The southern end of the segment crosses Cold Creek, which one of the most important bird migration corridors in Washington. The southern portion is also an important area for deer, elk, coyote, jackrabbit, and other species migrating between the YTC and the Hanford Site. Disturbance to this area could disrupt the migration patterns of these species, and increase the hazard of avian collisions with transmission lines and structures (moderate impact).

4.4.6 Alternative 1A

➡ Reminder

Impacts to wildlife would be moderate along Segment A and moderate to high along Segment B.

Alternative 1A would include Segment A, Segment B (Option B_{SOUTH}), Segment F, and the fiber optic line between Vantage and Columbia Substations.

Impacts to wildlife and wildlife habitat along Segment A and Segment B (Option B_{SOUTH}) would be the same as described for the Preferred Alternative. (See Section 4.4.3.1, *Segment A* and Section 4.4.3.2, *Segment B_{SOUTH}*).

4.4.6.1 Segment F

Along Segment F, approximately 104.65 acres of shrub-steppe would need to be temporarily cleared for construction access and approximately 51.95 acres would need to be permanently removed for structure sites and access roads. No riparian vegetation would need to be temporarily cleared for access roads and tower locations.

Impact levels in the area between the Vantage Substation and the crest of the Saddle Mountains would be similar to those described for

Segments D and E. Below the crest of the Saddle Mountains, the area is relatively undisturbed, with the exception of historical grazing and some motorized recreation activities. A historical sage grouse sighting was made near the study area, and a possible historical (pre-1978) Washington ground squirrel colony was located in the general vicinity of the proposed ROW. The top of the Saddle Mountains is a historic sage grouse corridor. If either of these species are still present, construction and clearing of the project would cause a high impact to them.

From the Saddle Mountains, Segment F cuts south across the Wahluke Slope. This section of the Wahluke Slope is not used for agriculture and is relatively undisturbed shrub-steppe habitat. Swainson's hawks are known to nest along this section and might be positively impacted by construction and operation of the project because new perch sites would be created by the towers. Other shrub-steppe-dependent species such as sage sparrows and sage thrashers would be impacted by removal of shrub-steppe vegetation during structure placement and road clearing (high impact).

After crossing Highway 24, Segment F enters the Hanford Site. The impacts to wildlife in this area would be similar to those impacts associated with Segment E.

4.4.7 No Action Alternative

The No Action Alternative would not change any existing conditions, and therefore would have no impact on any wildlife species. The impacts currently associated with ongoing maintenance activities for the existing transmission line, substations, and ROW would continue. These impacts include localized disturbance to wildlife and habitat due to vehicular traffic, transmission structure replacement, vegetation management activities, and access road improvements. No new impacts to wildlife and wildlife habitat are expected as a result of this alternative.

4.4.8 Threatened and Endangered Species

This section describes the impacts that the proposed project would have on the seven wildlife species that are either federally listed or proposed for listing: the grizzly bear, the gray wolf, the Canada lynx, the pygmy rabbit, the bald eagle, the northern spotted owl, and the marbled murrelet. A Biological Assessment has been prepared separately, and determination of the effects for each of these species is presented in that document. The effects determinations are presented in Table 4.4-1, *Threatened and Endangered Wildlife Species Effect Determination*. USFWS concurred with the findings on November 4, 2002.

Table 4.4-1
Threatened and Endangered Wildlife Species Effect Determinations

Listed Species	Effect Determination (Species)	Effect Determination (Critical Habitat)	Comments
Grizzly Bear *(Ursus arctos horribilis)* Threatened	No effect	Would not result in destruction or adverse modification of critical habitat	No documented populations within or near project area.
Gray Wolf *(Canis lupus)* Endangered	No effect	Critical habitat not designated	No documented populations or suitable habitat within or near project area.
Canada Lynx *(Lynx canadensis)* Threatened	No effect	Would not result in destruction or adverse modification of critical habitat	No documented populations or suitable habitat within or near project area.
Bald Eagle *(Haliaeetus leucocephalus)* Threatened	May affect, not likely to adversely affect	Critical habitat not designated	No documented nest sites near project area; wintering sites exist along Wilson/Naneum Creek and other crossings. Construction timing restrictions to be used.
Northern Spotted Owl *(Strix occidentalis caurina)* Threatened	No effect	Would not result in destruction or adverse modification of critical habitat	No documented populations or suitable habitat within or near project area.
Marbled Murrelet *(Brachyramphus marmoratus marmoratus)* Threatened	No effect	Would not result in destruction or adverse modification of critical habitat	No documented populations or suitable habitat within or near project area.

New Table for the FEIS.

Table 4.4-2
Proposed Listed Wildlife Species Effect Determinations

Proposed Species	Effect Determination (Species)	Effect Determination (Critical Habitat)	Comments
Wildlife Species			
Pygmy Rabbit *(Brachylagus idahoensis)* Proposed Endangered	No effect	Critical habitat not designated	No documented populations within or near project area, limited suitable habitat exists within project area.

New Table for the FEIS.

The grizzly bear, gray wolf, Canada lynx, northern spotted owl and marbled murrelet are not known to currently exist in the project area, so the proposed project will not impact these species.

4.4.8.1 Bald Eagle

Bald eagles are not known to nest within the study area. Wintering bald eagles are present in the area north of Ellensburg near Wilson and Naneum Creeks, in the YTC near Hanson and Alkali Canyon Creeks, and near the Columbia River crossings at Vantage, Midway and the Hanford Site. Construction near known bald eagle roost sites might disturb wintering bald eagles (high impact). In areas away from roost sites, the disturbance of bald eagles from construction will result in a minimal impact. Some eagle habitat would be removed. With mitigation (construction timing restrictions), the proposed project would have a moderate impact on bald eagles.

4.4.8.2 Pygmy Rabbit

There have been no confirmed sightings of pygmy rabbits within the project area. The nearest recorded sighting was made in 1979 in the Rattlesnake Slope area of the Hanford Reservation, south of the proposed Wautoma substation (WDFW, 1995). The nearest existing population (and the only currently known population in Washington) is well northeast of the proposed project in Douglas County (WDFW, 1995, 66 FR 59734-59749). Surveys of the YTC in the mid 1990s did not find populations of pygmy rabbits (ENSR, 1995). Construction through known pygmy rabbit populations or disturbance to ones nearby would be a high impact because they are extremely rare and sagebrush, a primary habitat component, would be removed.

4.4.9 Special Status Species

Table 4.4-3, *Impacts to Special Status Species*, lists state and federal special status species that may be present within each segment of the proposed study area and indicates the possible impact the project may have on them. The following sections describe potential impacts to two federal candidate species, the sage grouse and the Washington ground squirrel.

Table 4.4-3
Impacts to Special Status Species

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type	Potential Impact	Mitigated Impact
Species Not Present in Project Area						
Birds						
Northern Spotted Owl	FT	SE	NONE	N	N	N
Marbled murrelet	FT	ST	NONE	N	N	N
Ash-throated flycatcher	FSC	SM	NONE	N	N	N
Mammals						
Gray wolf	FE	SE	NONE	N	N	N
Canada lynx	FT	ST	NONE	N	N	N
Grizzly bear	FT	SE	NONE	N	N	N
Pacific fisher	FSC	SE	NONE	N	N	N
Wolverine	FSC	SC	NONE	N	N	N
Western gray squirrel	FSC	ST	NONE	N	N	N
Potholes meadow vole	FSC		NONE	N	N	N
Herpetofauna						
Cascades frog	FSC		NONE	N	N	N
Larch Mountain salamander	FSC	SS	NONE	N	N	N
Red-legged frog	FSC		NONE	N	N	N
Tailed frog	FSC	SM	NONE	N	N	N
Insects						
Mardon skipper	FC	SE	NONE	N	N	N
Riparian, Open Water and Wetland Species						
Waterfowl (Collision Risk from Infrastructure))						
Aleutian Canada goose	DM	ST	B, D, E, F	M	M	M
Harlequin duck	FSC		B, D, E, F	P	M	M
Common loon		SS	B, D, E, F	M	M	M
Black tern	FSC	SM	B, D, E, F	M	M	M
Caspian tern		SM	B, D, E, F	M	M	M
Forster's tern		SM	B, D, E, F	M	M	M
American white pelican		SE	B, D, E, F	M	M	M
Perching and Cavity-nesting Birds (Habitat Removal from Clearing)						
Bald eagle	FT	ST	ALL SEGMENTS	W	H	M
Osprey		SM	B, D, E, F	B	L	L
Great blue heron		SM	B, D, E, F	B	M	M
Black-crowned night heron		SM	B, D, E, F	B	M	M
Lewis' woodpecker		SC	A, C, D, E, F	B	M	M
Olive sided flycatcher	FSC		ALL SEGMENTS	P	M	M
Little willow flycatcher	FSC		ALL SEGMENTS	P	M	M
Bats (Collision Risk from Infrastructure, Habitat Removal from Clearing)						
Pacific western big-eared bat	FSC	SC	ALL SEGMENTS	P	M	M
Long-eared myotis	FSC	SM	ALL SEGMENTS	P	M	M
Long-legged myotis	FSC	SM	ALL SEGMENTS	P	M	M
Fringed myotis	FSC	SM	ALL SEGMENTS	P	M	M
Western small-footed myotis	FSC	SM	ALL SEGMENTS	P	M	M
Yuma myotis	FSC		ALL SEGMENTS	P	M	M
Pallid bat		SM	ALL SEGMENTS	P	M	M
Herpetofauna (Habitat Removal from Construction and Clearing)						
Northern leopard frog	FSC	SE	D, E, F	P	Mn	Mn
Spotted frog	FC	SE	ALL SEGMENTS	P	Mn	Mn
Woodhouse's toad		SM	E, F	B	Mn	Mn
Shrub-Steppe Species						
Raptors and Migratory Birds (Collision Risk from Infrastructure)						
Northern goshawk	FSC	SC	ALL SEGMENTS	M	M	M
Golden eagle		SC	B, C, D, E, F	B	M	M
Ferruginous hawk	FSC	ST	ALL SEGMENTS	B	M	M
Swainson's hawk		SM	ALL SEGMENTS	B	M	M
Prairie falcon		SM	ALL SEGMENTS	B	M	M
Peregrine falcon	FSC	SE	C, D, E, F	B	M	M
Turkey vulture		SM	B, D, E, F	B	M	M
Western bluebird	FSC	SM	ALL SEGMENTS	B	M	M

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type	Potentia l Impact	Mitigated Impact
Sagebrush-Dependent Birds (General Disturbance, Habitat Fragmentation and Removal from Construction)						
Sage sparrow		SC	ALL SEGMENTS	B	H	H
Sage thrasher		SC	ALL SEGMENTS	B	H	H
Long-billed curlew	FSC	SM	A, C, E, F	B	H	H
Western sage grouse	FSC	ST	A, C, F	B	H	H
Loggerhead shrike	FSC	SC	ALL SEGMENTS	B	H	H
Grasshopper sparrow	FSC	SM	C	B	H	H
Sharp-tailed grouse	FSC	ST	NONE	H	H	H
Mammals (General Disturbance)						
California bighorn sheep	FSC		B, D, E, F	P	L	L
White-tailed jackrabbit		SC	ALL SEGMENTS	B	M	M
Small Burrowing Species (General Disturbance, Habitat Fragmentation and Removal from Construction)						
Burrowing owl	FSC	SC	C, D, E, F	B	H	M
Washington ground squirrel	FC	SC	D, E, F	H	H	M-N
Pygmy rabbit	FSC	SE	D, E, F	H	H	M-N
Ord's kangaroo rat		SM	B, D, E, F	P	H	M
Northern grasshopper mouse		SM	ALL SEGMENTS	P	H	M
Sagebrush vole		SM	ALL SEGMENTS	P	H	M
Merriam's shrew		SC	ALL SEGMENTS	B	H	M
Herpetofauna (Habitat Fragmentation and Removal from Construction)						
Sagebrush lizard	FSC		ALL SEGMENTS	B	H	M
Nightsnake		SM	B, D, E, F	P	H	M
Striped whipsnake		SC	ALL SEGMENTS	B	H	M
Insects (Habitat Removal from Construction)						
Persius' duskywing		SM	E	P	Mn	Mn

Federal Status
FE = Endangered
FT = Threatened
FC = Candidate
D = Delisted
FSC = Species of Concern
H = Historically Present, Not Currently Present

State Status
SE = Endangered
ST = Threatened
SS = Sensitive
SC = Candidate
SM = Monitor

Documented Occurrence Type
P = Present (general presence)
B = Breeding
M = Migrant
W = Winter Resident
N = Not Present

Table has been updated for the FEIS.

4.4.9.1 Washington Ground Squirrel

The Washington ground squirrel is a federal candidate for listing and a state species of concern. Much of the study area is located west of the Columbia River, outside of the Washington ground squirrels' known historical range. One historical occurrence (pre-1978) was noted near Segment F in the Saddle Mountains (Betts, 1990). The nearest known existing population is approximately 5 miles east of Segment F north of the Saddle Mountain crest (Nature Conservancy, 2001). Suitable Washington ground squirrel habitat may exist within the study area east of the Columbia River, especially near Lower Crab Creek (Hill, 2001) and the Wahluke Slope (Nature Conservancy 2001). Surveys of suitable habitat did not find any populations of Washington ground squirrels. Construction of a new line and access roads on the preferred alternative would have low or no impact on any Washington ground squirrel colonies that might exist near the study area because no colonies have been observed. On other alternatives, if construction were to occur in or near populations of

Washington ground squirrel, impacts would be high. If no populations are present, impacts would be low to none.

4.4.9.2 Sage Grouse

The sage grouse is a candidate for federal listing. WDFW lists the sage grouse as threatened. In Washington, sage grouse have historically ranged from the Columbia River, north to Oroville, west to the foothills of the Cascades, and east to the Spokane River. Within the study area, they are known to exist within each of the six drainages in the YTC that are crossed by sections of Segments A, B, and C. Sage grouse are known to nest in the Alkali Canyon and Corral Canyon drainages. A historical ***lek*** in the Johnson Creek drainage has not been used since 1987. Most of the core sage grouse habitat in the YTC is west of the proposed route. The Cold Creek drainage provides important breeding, nesting, and year-round use areas. Construction of Segments A and B would cause a low-moderate impact to sage grouse. Construction of Segment C would cause a high impact to sage grouse because part of this segment passes through occupied core sage grouse habitat that would be altered by construction activities. Construction of Segments D, E, and F would cause a low to moderate impact to sage grouse because it would disturb habitat that could act as dispersal areas for birds from the YTC should the population increase and expand. Birds flying through these areas could also collide with the transmission lines. The addition of transmission towers could increase the amount of Golden eagle or other raptor perching areas, leading to increased risk of predation on sage grouse on all segments.

Reminder

*A **lek** is an open area where sage grouse gather in the spring to perform courtship dances.*

4.4.10 Recommended Mitigation

To reduce the impacts to wildlife associated with the construction, operation, and maintenance of the proposed project, a number of project-wide mitigation measures would be implemented.

4.4.10.1 Big Game Disturbance

- Construction on Segments A, E, or F would be coordinated with WDFW during extreme winter weather or unusually heavy snow accumulations, when big game species are less mobile and more vulnerable to disturbance to ensure that construction activities would not significantly interfere with big game wintering.
- New or existing roads may be gated and signed to prevent human encroachment into big game wintering areas or significant migration corridors.

4.4.10.2 Avian Collision Mitigation

- Where possible, new structures would be lined up with existing structures to minimize vertical separation between sets of transmission lines.
- Appropriate line markers would be installed in high-risk areas, such as crossings of the Columbia River, Lower Crab Creek, the Cold Creek migration corridor, high ridge crossings such as the Saddle Mountains, Umtanum Ridge and Yakima Ridge and on Hanford Reach National Monument lands. Spiral markers will be used on the overhead ground wires and/or fiber optic line in high risk areas, because these are the parts of the transmission line structure most often struck by birds (conductors are generally big enough to be seen). Spiral markers strung along these wires make them more visible to passing birds and easier to avoid.

4.4.10.3 Raptor Disturbance Mitigation

- Project construction would be timed to avoid critical nesting periods in known raptor nest locations, as determined by USFWS and WDFW.
- Project construction would be timed to avoid disturbing wintering bald eagles in areas of suitable winter habitat. Known eagle wintering locations include Wilson and Naneum Creeks. Construction in these areas would be avoided from November 1 through April 1.

4.4.10.4 Shrub-Steppe Habitat Loss Mitigation

- To minimize the impacts to shrub-steppe, a Priority Habitat, the construction activities would be confined to designated construction work areas.
- Vegetation for temporary vehicle travel or equipment storage would not be cleared outside of designated construction areas; crushing is preferable to removal.
- When possible, use of access roads would be avoided in steep terrain during unusually wet or muddy conditions.
- Noxious weed spread would be prevented by inspecting for and removing noxious weeds from vehicles prior to entry into the project area, revegetating disturbed areas using native seed mix at appropriate planting times as indicated by USFWS, BLM, BOR, and YTC, and selectively applying herbicide as needed.
- Fire fighting equipment would be carried in all vehicles and seasonal fire restrictions on construction would be observed. Vehicles would be parked in areas free from dry grass or other vegetation.

4.4.10.5 Wildlife Disturbance Mitigation

- New or existing roads may be gated and signed at appropriate locations to prevent human encroachment into areas containing significant wildlife populations or relatively undisturbed wildlife habitat.
- Construction, operation and maintenance activities would be timed to avoid entry into sensitive wildlife habitats during critical breeding or nesting periods (as determined by USFWS and WDFW).
- Vegetation removal would be limited to only the amount required to safely construct new access roads. Riparian vegetation would be removed only where absolutely necessary for line clearance purposes. Large trees may be left where they are felled so as not to remove sources of large woody debris. Small trees and shrubs would be left along stream channels to provide continued stream shading.

Potential impacts to sage grouse would be mitigated by implementing the following measures:

- Existing access roads would be used where possible. Spur roads would lead to new tower locations, rather than an entirely new road along the new ROW.
- Off-road travel would be minimized such as that necessary for turning equipment and vehicles around or parking and staging equipment. In these areas, construction crews would be instructed to crush vegetation in place to accomplish vehicle turnaround, rather than clearing it with equipment. This would help avoid soil compaction, reduce the area requiring revegetation, and reduce the potential for noxious weed spread.
- Disturbed areas would be revegetated using native seed mixes appropriate to the area (seed mixes would be developed specifically for locations in the YTC, the Saddle Mountains, and Umtanum Ridge).
- Line markers would be placed on each span in the YTC to alert low-flying aircraft to the presence of transmission lines. These markers would also allow sage grouse to better see the overhead ground wire and avoid impacting them. Line markers would also be placed on the overhead ground wire on Hanford Reach National Monument lands, which in the project area, may serve as a potential dispersal corridor for sage grouse and other birds and mammals moving between the monument and the YTC.

- Other specific mitigation measures for removal of shrub-steppe vegetation are being developed in coordination with staff of the Hanford Reach National Monument.

4.4.11 Cumulative Impacts

The proposed project could potentially impact the existing environmental conditions of current concern in eastern Washington, especially from the loss/fragmentation of native shrub-steppe plant and dependent wildlife communities.

The shrub-steppe habitat type has been significantly reduced from historical levels in Washington, and much of the remaining habitat is heavily disturbed by grazing, fire, or other land uses. It is generally recognized that preserving large, unbroken tracts of high quality shrub-steppe vegetation is important for maintaining populations of shrub-steppe dependent species such as sage grouse, sage sparrow, Washington ground squirrel and others (Johnson and O'Neil, 2001). WDFW has declared the shrub-steppe habitat type as a Priority Habitat.

Construction of structures and access roads through shrub-steppe vegetation would increase the existing levels of habitat fragmentation and reduce the amount of shrub-steppe vegetation available for wildlife habitat. Over time, native shrub-steppe vegetation may recolonize the disturbed areas. However, construction of the proposed project would increase the potential for the linear spread of noxious weeds into previously undisturbed areas. The presence of noxious weeds makes the recolonization of disturbed areas with native vegetation extremely difficult, and generally leads to a long-term reduction in quality wildlife habitat.

4.5 Fish Resources

4.5.1 Impact Levels

➡ Reminder

*A **take** is to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct.*

*To **harm** is to injure directly, or cause significant habitat modification or degradation that results in death or injury to a species.*

High impacts to fish would occur when an action creates a significant adverse change in fish habitat, populations or individuals. High impacts might result from actions that:

- cause the ***take*** of a federally listed or proposed threatened, endangered fish species.
- cause a significant long-term (more than two years) adverse effect on the populations, habitat and/or viability of a federal or state listed fish species of concern or sensitive species, which would result in trends towards endangerment and/or the need for federal listing.
- ***harm*** or kill a significant number of individuals of a common fish species at the local (stream reach or small watershed) level.

Moderate impacts to fish would occur when an action creates a moderate adverse change in fish habitat, populations or individuals. Moderate impacts might result from actions that:

- without causing a take, cause a temporary (less than two months) reduction in the quantity or quality of localized (stream reach or small watershed) aquatic resources or habitats at a time when federally listed threatened, endangered, or proposed fish species are **not likely** to be present (i.e., during non-spawning or rearing times).
- cause a short-term (up to two years) localized (stream reach or small watershed) reduction in population, habitat and/or viability of a federal or state listed fish species of concern or sensitive species, without causing a trend towards endangerment and the need for federal listing.
- harm or kill a small number of individuals of a common fish species at the local (stream reach or small watershed) level.

Low impacts to fish would occur when an action creates a minor or temporary adverse change in habitat, populations, or individuals. Low impacts might result from actions that:

- cause a temporary (less than two months) localized (stream reach or small watershed) reduction in the quantity or quality of aquatic resources or habitats of state listed fish species of concern or sensitive species, without causing a trend towards endangerment and the need for federal listing.

- cause a short-term (up to two years) disturbance or displacement of common fish species at the local (stream reach or small watershed) level.

No impacts to fish would occur when an action has no effect or fewer impacts than the low impact level on fish habitat, populations or individuals.

4.5.2 Impacts Common to Construction Alternatives

The construction, operation and maintenance of the proposed transmission line will impact fish populations that reside in or near the study area. The extent of impact would depend on the fish species, its distribution, its habitat requirements, and the availability of suitable habitat in and around the construction and study area. (See Table 4.5-1, *Water Crossings and Fish Presence*.)

Table 4.5-1
Water Crossings and Fish Presence

Line Segment	Preferred (2)	Alternativ e 1	Alternativ e 3	Alternativ e 1A	V-C Fiber
Intermittent Drainages[1]	44	41	68	38	2
Canals and Drains[2]	9	4	0	1	8
Lakes	1	2	1	2	6
Perennial Streams	11	11	20	11	2
Fish Bearing Streams[3]	10	11	17	11	2

1 Intermittent drainages were determined from USGS 7.5 minute quad maps. These drainages may be seasonally intermittent or only contain water during storm events. It is assumed that these drainages do not contain fish.

2 Canals and drains were determined from USGS 7.5 minute quad maps. Although fish may be periodically observed, it is assumed that canals and drains do not contain fish.

3 Perennial streams that are known to contain fish. Where the ROW crosses the intermittent headwaters of a perennial stream that is known to contain fish, it is assumed that fish are present and could be affected by the project.

Table has been updated for the FEIS.

4.5.2.1 Construction Impacts

Short-term construction disturbances, depending on the time of year and the location, could impact various fish species by causing sedimentation, habitat and/or individual fish disturbance, or the release of hazardous materials into a waterway. The following would be potential short-term impacts:

- Damage to fish or fish habitat could occur from construction sediments entering streams.
- Soil from roads, cleared areas, excavations, stockpiles or other construction sources could enter streams and cause an increase in ***sediment load*** and/or ***sediment deposition*** in spawning gravels.
- Concrete washing or dumping could allow concrete waste to enter streams and cause an increase in sediment load.

For Your Information

Sediment load *is the amount of sediment moved by stream.*

Sediment deposition *is sediment deposited on a streambank or streambed.*

- Other construction materials (metal parts, insulators, wire ends, bolts, etc.) could enter streams and cause changes in flow or other unknown effects.
- Mechanical disturbance of fish habitat could occur from equipment operating in, crossing, or passing streams.
- Streambank compaction or sloughing could reduce the streambank's ability to support vegetation, or cause sediment input or increased runoff.
- Heavy equipment moving across a stream (or repeated travel by light equipment) could cause substrate disturbance, including sediment release or substrate compaction.
- Riparian vegetation destruction or removal (this would be incidental only; planned vegetation removal for new ROW and roads is a long-term impact) could cause a loss of fish habitat (cover), loss of stream shading, removal of large woody debris sources, and reduction could occur in ***buffer*** capacity.

For Your Information

*A **buffer** is the ability of streamside riparian vegetation to protect the stream against sediment or other pollutant input.*

- Disturbance of individual fish from equipment operating in or near streams.
- Vibration or shock from equipment operating in or near streams could drive fish to less suitable habitat or to areas where predation is more likely. In marginal conditions such as extreme low flows and high water temperatures, stress from repeated disturbance could cause death.
- Mechanical injury or death could occur from equipment crossing or operating in streams, especially to fish that live in or on the bottom of the stream (such as sculpins).
- Injury or death of fish or their prey could result from hazardous materials spills.
- Petroleum fuel products, hydraulic oil, and other hazardous materials typically associated with construction activities could enter the stream, causing fish kills, aquatic invertebrate kills, and death or injury to a number of other species that fish depend on for food. Spills may also create pollution "barriers" to fish migration between stream reaches.

Depending on the location and the fish species present, short-term impacts could range from low to high. Short-term disturbances such as those listed above would constitute a high or medium impact on most species. However, since most of the project construction will occur away from streams and include mitigation (such as construction timing restrictions and spill prevention and erosion measures), short-term construction-related disturbances should result in low or no impacts to all fish species.

4.5.2.2 Operation and Maintenance Impacts

Long-term impacts resulting from ongoing operation and maintenance would result mostly from habitat alteration due to clearing of riparian vegetation, changes in runoff and infiltration patterns (from upland vegetation clearing), sedimentation from cleared areas, and maintenance access across streams.

Since the new transmission line would span narrow riparian areas or be located upslope of stream channels, little or no riparian vegetation would be removed. Where access roads are required to cross streams, riparian vegetation may be removed. Since riparian areas are extremely important in providing stream shading and cover for fish, and are a source of large woody debris in streams, any clearing of stream-side riparian vegetation would likely cause moderate to high impacts to fish species, should they be present.

The area cleared for structure construction and access roads in upland areas could change runoff and infiltration patterns to the extent that flow regimes in creeks would be altered, especially in smaller drainages. A decrease in groundcover from vegetation removal can cause an increase in sheet flow during storm events, with correspondingly less infiltration. This can cause higher flood flows in creeks and reduce the amount of infiltrated water that can support base flows. Higher flood flows cause more erosion and deposition of fine materials, which may affect fish habitats or cause physical damage to fish through gill abrasion. Lower base flows, in areas where base flows are already low, may cause streams to dry up in some places or result in warmer water temperatures, which can cause harm or be lethal to fish.

Clearing for roads and structure sites increases the risk of sediment input due to the erosion of soil that is normally stabilized by vegetative cover. Sedimentation of streams can cause a degradation of spawning areas, by filling the ***interstitial spaces*** in spawning gravels. This reduces the flow of oxygenated water necessary for egg and ***alevin*** survival.

For Your Information

*The **interstitial spaces** refer to the spaces or openings in substrates that provide cover and habitat for bottom-dwelling plants and animals.*

*An **alevin** is a recently hatched juvenile fish still residing in the gravel of a stream.*

Creating new vehicle access across streams can cause bank compaction, repeated sediment disturbance, disturbance or physical damage to fish (if present), a conduit for sediment input, and the possible release of automotive wastes such as fuel or hydraulic oil into a stream. Stream crossings of intermittent <u>and ephemeral</u> drainages would be accomplished by constructing fords where possible. Ford construction would involve removing a portion of the streambed below grade, then backfilling it with crushed rock or other suitable rocky material to the original streambed level. Ford approaches would be stabilized with crushed rock to reduce erosion and provide an all weather surface. Drainages that are too incised or steep to ford may be fitted with culverts or bridges to provide water and debris passage.

Perennial streams would be crossed using existing crossings, where possible. In areas where adequate crossings or alternative routes do not currently exist, bridges or culverts would be used to maintain fish passage and stream flows, while providing vehicle access. Approaches to crossings would be stabilized with crushed rock to reduce erosion and provide an all weather surface. Access roads would experience intense use during construction, but long-term use should not increase much over current threshold levels once construction is complete.

Operation of the proposed project would be limited to energizing the conductors. Normal operation of the project would have no impact on fish species. (See Appendix J Addendum for more information about potential effects of EMF on various species.)

Maintenance of the project might include periodic vehicle and foot inspections, helicopter surveys, tower and line repair, ROW clearing, and other disturbances. Depending on the time of year and location, maintenance activities could impact fish species or habitat. Periodic ROW clearing will be mostly limited to riparian areas, where the impact might be high. Maintenance impacts will be similar to those impacts related to short-term construction (Section 4.5.2.1, *Construction Impacts*).

4.5.3 Preferred Alternative (Alternative 2)

The Preferred Alternative would include Segment A, Segment B (Option B_{SOUTH}), Segment D, and the fiber optic line.

4.5.3.1 Segment A

Reminder

Fish bearing waterbodies are shown on Map 6, Fisheries.

Segment A would cross 28 intermittent drainages and 9 perennial streams, six of which are known to be fish bearing. Wilson Creek, Naneum Creek, Schnebly Creek, Coleman Creek, Cooke Creek, Caribou Creek, and Parke Creek are all known to contain fish, although Schnebly and Parke Creeks are intermittent near the project area and probably do not contain fish where the project would cross them. Cave Canyon Creek does not contain fish.

Both Wilson Creek and Naneum Creek are in steep canyons. Structures would be placed high up and well away from both streams. Access would be through existing county and access roads. Since no new construction would occur near the streams, no impacts to fish are expected. The increase in traffic along the existing roads would be insignificant. Options 1 and 2, associated with the Sickler-Schultz Reroute, would cross different areas of Wilson Creek. However, both areas have similar vegetation and fish habitat and towers would be placed away from the creek and no vegetation would be removed.

Schnebly Creek would have an existing double culvert that would need to be replaced. This would involve work below the ordinary high water mark; however, work could be done when the creek is dry and few if any impacts to fish would be expected. Coleman Creek has an existing access from county and access roads, and the structures would be constructed high up and away from the creek edges. No impacts to fish are expected.

Cooke Creek, near its proposed crossing, has several channels and lies in a wide floodplain that is mostly pasture. Structures would be located on either side of the creek and the existing bridge across Cooke Creek would be used for access. Removal of riparian vegetation would be required for overhead clearance. This could create a moderate impact to rainbow trout, cutthroat trout, and brook trout. With mitigation (See Section 4.5.10, *Recommended Mitigation*), this impact would be reduced to low.

Caribou Creek and Parke Creek both have access from either side of the creek, eliminating the need for new crossings. Structures would be located well away from the creek. No impacts to fish are expected.

Middle Canyon Creek would be crossed in its headwaters, where conditions are unsuitable for fish survival.

4.5.3.2 Segment B

The Preferred Alternative would only use Option B_{SOUTH} of Segment B. Option B_{NORTH} would not be used. Segment B (Option B_{SOUTH}) would cross six intermittent drainages, one fish-bearing perennial stream (Johnson Creek), and the Columbia River, which is also fish bearing.

Johnson Creek would be crossed on an existing improved concrete ford in an area where the stream is intermittent. Therefore, there would be no direct impacts to fish (injury, disturbance from equipment, etc.). However, in the unlikely event of a hazardous materials spill from equipment traveling across the fords, contaminants could move downstream to where fish are present. Thus, indirect impacts to fish could be high depending on the nature and quantity of the spill and the time of year it occurs. With mitigation such as construction during ***in-water work windows,*** spill control and erosion controls (See Section 4.5.10, *Recommended Mitigation*), impacts to fish in these streams should be low.

For Your Information

In-water work windows *are times of year, determined by WDFW, when instream work is least likely to harm listed species.*

The Columbia River would be crossed by a long span, with structures set well away from the banks. Since the structures and access roads would be far away from the edge of the river, sediment or other materials would not be able to reach the water. Therefore, there would be no impacts to any fish species in the Columbia River along Segment B.

Should Option B_{NORTH} of Segment B be used, it would cross five intermittent drainages, one fish-bearing perennial stream (Johnson Creek), and the Columbia River, which is also fish bearing. Impacts to fish species would be the same as those discussed above for Option B_{SOUTH}.

4.5.3.3 Segment D

Segment D crosses 11 intermittent drainages, nine canals or drains, one perennial stream, and the Columbia River. Lower Crab Creek, and the Columbia River both contain fish.

The Lower Crab Creek crossing would have structures placed over 200 feet from the stream bank. Access would be from either side, so no new crossings of Lower Crab Creek are proposed. Since no new construction will occur near Lower Crab Creek, impacts to fish (chinook salmon, steelhead, rainbow trout, brown trout and warm water fish) are expected to be low.

The proposed crossing of the Columbia River would parallel the existing transmission lines. The structures would be set over 200 feet from the edge of the river, and access would be from existing roads on either side of the river. Since no new access roads near the river would be built and there is sufficient distance from the structures to the river, no sediments spills or other materials would be able to easily enter the river. Impacts are expected to be low.

4.5.3.4 Fiber Optic Line

The proposed fiber optic component of the project would use existing access roads and would not involve any new tower construction. Several small areas would be used by equipment for cable pulling and reeling sites; however, these areas would not be located close to any streams or other waters. None of the existing towers are located close to fish-bearing streams (all are crossed by long spans). Therefore, installation of the fiber optic line would have no effect on any fish species.

4.5.4 Alternative 1

Alternative 1 would include Segment A, Segment B (Option B_{SOUTH}), Segment E, and the fiber optic line between the Vantage and Columbia Substations.

Impacts to fish resources along Segments A, B and the fiber optic line between Vantage and Columbia Substations would be the same as described for the Preferred Alternative. (See Section 4.5.3.1, *Segment A* and Section 4.5.3.2 *Segment B*.)

➡ Reminder

Impacts to fish would be low along Segments A and B.

4.5.4.1 Segment E

Segment E crosses eight intermittent streams, four canals or drains, two lakes, one perennial stream, and the Columbia River. Both lakes, the stream, and the Columbia River contain fish. Segment E would parallel Segment D from the Vantage Substation to the top of the Saddle Mountains, then head southeast into the Hanford Site.

No Wake Lake is a private constructed lake used for water skiing. It contains warm water species of fish. Structures may be placed close to the water, but access would be from either side. The land surrounding the lake is relatively flat, which would limit the erosion potential from structure and access road construction, and limit the potential for spills to enter the lake. No impacts to fish are expected at this location.

Since Segment E would cross Lower Crab Creek near the locations where Segment D would cross, impacts would be similar for this area to those described for Segment D. Towers would be placed over 200 feet from the banks and no access road crossing would be installed.

Saddle Mountain Lake would be crossed at its eastern end, near where the overflow channel (Saddle Mountain Wasteway) exits. An existing access road crosses the wasteway and could be used for access. Structures would be placed over 200 feet from either side of the edge of the lake. Riparian vegetation is relatively low, although some trees may need to be removed for overhead access. The lake supports warm water fish only. Since no new access roads would be built, structures would be located away from the lake. No sensitive fish species are present, so impacts would be low.

The Columbia River crossing into the Hanford Site would be accessed from either side of the river. Structures would be placed well back from the edge of the river. There is very little riparian vegetation in this area and none of it would need to be cleared. Impacts to fish species in the Columbia River at this location would be low.

4.5.5 Alternative 3

Reminder

Impacts to fish would be low along Segment A.

Alternative 3 would include Segment A, Segment C, and the fiber optic line.

Impacts to fish resources along Segment A and the fiber optic line would be the same as described for the Preferred Alternative. (See Section 4.5.3.1, *Segment A*.)

4.5.5.1 Segment C

Segment C construction would cross 40 intermittent drainages and six perennial steams, five of which are fish bearing. Middle Canyon Creek, Johnson Creek, Hanson Creek, Alkali Canyon Creek, and Corral Canyon are all known to contain fish. No fish are present in Cold Creek.

Middle Canyon Creek and Johnson Creek would be crossed with fords in their headwater sections. Impacts to fish in these two creeks would be similar to those described for Segment B.

Hanson Creek and Alkali Canyon Creek both contain rainbow trout and brook trout throughout their lower and middle reaches. Both of these creeks and Corral Canyon Creek support chinook salmon in their very lowest reaches near the Columbia River. These creeks are in steep canyons, so the structures would be placed on either side of the canyons well above the creek. No impacts are expected from structure construction and placement. However, all three of these streams would need to have bridges or culverts placed in them to allow vehicular access. Impacts to fish, especially chinook salmon, from construction of these access roads and structures could be high, depending on when the construction occurs, if sediments or spills enter the creek, and if fish are present. With mitigation such as in-water work during work windows, erosion and spill control measures, and construction of structures that allow fish passage (See Section 4.5.10, *Recommended Mitigation*), impacts to rainbow trout, brook trout, and chinook salmon would be low.

4.5.6 Alternative 1A

Reminder

Impacts to fish would be low along Segments A and B.

Alternative 1A would include Segment A, Segment B (Option B_{SOUTH}), Segment F, and the fiber optic line.

Impacts to fish resources along Segments A, B, and the fiber optic line between Vantage and Columbia Substations would be the same as described for the Preferred Alternative. (See Section 4.5.3.1, *Segment A and* Section 4.5.3.2, *Segment B).*

4.5.6.1 Segment F

Segment F would cross 30 intermittent drainages, one canal, one lake, one perennial stream, and the Columbia River. Nunnally Lake, Lower Crab Creek, and the Columbia River all contain fish.

Nunnally Lake is a closed depression north of Lower Crab Creek that has been filled with water and contains rainbow trout and various warmwater fish species. It is managed as a recreational fishery. Access roads would be routed around the lake, and structures would be located on either side, over 200 feet from the edge of the lake. Since no new access roads would be constructed near the lake, structures would be placed far away from the edge, and no riparian vegetation would be removed, the impact to fish in Nunnally Lake would be low.

Segment F would cross Lower Crab Creek approximately one mile upstream of where Segment D and E cross. No access road would be construction across the creek and the towers would be placed over 200 feet away from the stream. Impacts to fish are expected to be low.

Segment F would use the same crossing of the Columbia River as described in Segment E, so impacts to fish would be similar to those described in that section.

4.5.7 No Action Alternative

The impacts currently associated with ongoing maintenance activities for the existing transmission line, substations, and ROW would continue. These impacts include localized soil disturbance and potential sedimentation of streams due to vehicular traffic, transmission structure replacement, vegetation management activities, and access road improvements. In addition, vehicle and machinery use, and vegetation management practices could contribute minor amounts of pollutants (e.g., fuel, oil, grease, rubber particulate, woody debris) that could be transported to streams. No new impacts to fish resources are expected under the No Action Alternative.

4.5.8 Threatened and Endangered Species

Table 4.5-3, *Impacts to Fish Species*, contains listed fish species present within the study area. A discussion of the impacts to federally listed threatened, endangered, or candidate species follows. A Biological Assessment has been prepared separately, which presents effects determinations for each of these species. Table 4.5-2, *Threatened and Endangered Fish Species Effect Determinations*, summarizes determinations for listed fish species. USFWS concurred with the findings in the BA on November 4, 2002. There were no effects to fish species listed by NMFS so they did not review the BA.

Table 4.5-2
Threatened and Endangered Fish Species Effect Determinations

Listed Species	Effect Determination (Species)	Effect Determination (Critical Habitat)	Comments
Fish Species			
Middle Columbia River Steelhead Trout *(Oncorhynchus mykiss)* Threatened	Would not result in destruction or adverse modification of critical habitat	No effect	In-water work in (formerly) designated critical habitat. Nearest current populations >12 miles downstream. Work to be done when stream is dry.
Upper Columbia River Steelhead Trout *(Oncorhynchus mykiss)* Endangered	Would not result in destruction or adverse modification of critical habitat	No effect	No in-water work in (formerly) designated critical habitat.
Upper Columbia River Spring Run Chinook Salmon *(Oncorhynchus tshawytscha)* Endangered	Would not result in destruction or adverse modification of critical habitat	No effect	No in- water work in (formerly) designated critical habitat.
Bull Trout *(Salvelinus confluentus)* Threatened	Critical habitat not designated	No effect	No in-water work in historical or current bull trout streams.

New table for the FEIS.

For Your Information

ESU *- Evolutionarily Significant Unit*

4.5.8.1 Chinook Salmon (Upper Columbia River Spring Run ESU)

Upper Columbia River chinook salmon (a federally listed endangered species) are present in the study area only in the Columbia River, where the Preferred Alternative and Alternatives 1, 3, and 1A (specifically, Segments B_{NORTH}, B_{SOUTH}, D, E, and F) cross it. The construction and operation of Segments A, and C would have no impact on Upper Columbia River chinook salmon, as they are not present in the Yakima River basin and the streams that these segments cross.

Construction of any of the three Columbia River crossings associated with the Preferred Alternative and Alternatives 1, 3, and 1A would also have no impact on Upper Columbia River chinook salmon. This is because structures would be built far enough away from the river bank and riparian areas to eliminate the potential for sediments, spills or other materials to enter the river. New structures at river crossings would parallel existing structures, which range from 200 to 1,000 feet from the edge of the river. Access to the structures would be limited to the landside of the structures and would not enter the riparian zone. Riparian vegetation removal would not be required at any of the Columbia River crossings.

4.5.8.2 Steelhead Trout (Upper and Middle Columbia River ESUs)

Middle Columbia River ESU steelhead (a federally listed threatened species) are present in the Yakima River basin, but are not known to exist in the streams along Segment A. However, these streams were formally federally designated critical habitat until Spring of 2002. Upper Columbia River ESU steelhead (a federally listed endangered species) are present in the lower reaches of two streams crossed by Segments B_{NORTH}, B_{SOUTH}, C, D, E, and F. They also exist in the Columbia River where Segments B_{NORTH}, B_{SOUTH}, D, E, and F cross it.

The streams along Segment A in the Yakima River basin might have minor impacts to water quality should construction cause sediments or other materials to enter these stream, causing a moderate impact to Middle Columbia River steelhead. However, with mitigation (See Section 4.5.10, *Recommended Mitigation*), no impacts to Middle Columbia River Steelhead would be expected.

The Columbia River crossings (described in the chinook salmon section above) would have no impact on Upper Columbia River steelhead. Crossings of Johnson Creek on Segments B_{NORTH}, B_{SOUTH}, C, and G would not directly impact Upper Columbia River steelhead, since this creek does not support steelhead where these proposed segments cross it. However, the lower reach of Johnson Creek does support steelhead, and indirect impacts could occur from sediments, spills, or other materials entering the creek, or removal of upland and riparian vegetation that might change flow regimes and increase stream temperatures. The area of Lower Crab Creek where Segments D, E, and F cross it may support steelhead; however, the construction of structures and access roads would not occur within 200 feet of Lower Crab Creek, and no riparian vegetation would be removed. Thus, with mitigation (See Section 4.5.10, *Recommended Mitigation*), no impacts to Upper Columbia River steelhead would be expected.

For Your Information

DPS *- Distinct Population Segment*

4.5.8.3 Bull Trout Columbia River DPS

Bull trout (a federally listed threatened species) are not known to currently exist within any of the streams, lakes crossed by the project, except the Columbia River (O'Conner, 2002). Coleman Creek, near Ellensburg, is known to have historically contained bull trout, but none have been observed since 1970 and it is unknown whether any are still present. No historical records of bull trout are documented in any of the other proposed stream crossings. Existing bridges would be used to cross Coleman Creek and the Columbia River, and structures would be placed well away from the edges of both waterways. Since construction would occur far from Coleman Creek and the Columbia River, and no sediments, spills, or other materials would be likely to enter these waterways, the project would have no impact on bull trout. (See Table 4.5-3, *Impacts to Fish Species*.)

Table 4.5-3
Impacts to Fish Species

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type	Potential Impact	Mitigated Impact
Chinook Salmon (Upper Columbia River Spring Run ESU)	FE	SC	B_{NORTH}, B_{SOUTH}, D, E, F, Fiber optic	P	Low	None
Steelhead Trout (Middle Columbia River ESU)	FT	SC	A	P	Low	None
Steelhead Trout (Upper Columbia River ESU)	FE	SC	B_{NORTH}, B_{SOUTH}, C, D, E, F, Fiber optic	P	Low	None
Bull Trout	FT	SC	A, B_{NORTH}, B_{SOUTH}, D, E, F	P	Low	None

FE = Endangered SC = Candidate P = Present (general presence)
FT = Threatened H = Historically Present, Not Currently Present

Table has been updated for the FEIS.

4.5.9 Special Status Species

Table 4.5-4, *Impacts to Special Status Fish Species*, lists state and federal special status species that may be present within each segment of the study area and indicates the possible impact the project may have on them.

Table 4.5-4
Impacts to Special Status Fish Species

Species Name	Federal Status	State Status	Possible Presence by Line Segment	Documented Occurrence Type	Potential Impact	Mitigated Impact
Coastal Cutthroat Trout	FP		NONE	N	None	None
Westslope Cutthroat Trout	FSC		A	P	Low	Low
Interior Redband Trout (Rainbow)	FSC		ALL SEGMENTS	P	Low	Low
Margined Sculpin	FSC		NONE	N	None	None
Pacific Lamprey	FSC		B_{NORTH}, B_{SOUTH}, D, E, F, Fiber optic	P	Low	None
River Lamprey	FSC		A	P	Low	None

Federal Status
FE = Endangered
FT = Threatened
FC = Candidate
FSC = Species of Concern
FP = Proposed Listed

State Status
SE = Endangered
ST = Threatened
SS = Sensitive
SC = Candidate
SM = Monitor

Presence
P = Present (general presence)
B = Breeding
M = Migrant
W = Winter Resident
N = Not Present
H = Historically Present, Not Currently Present

Table has been updated for the FEIS.

4.5.10 Recommended Mitigation

The following mitigation measures would be implemented in order to reduce or eliminate impacts to fish species from the construction, operation, and maintenance of the proposed project.

To minimize short- and long-term impacts to fish from structure construction:

- In-water work on Schnebly Creek would be conducted during the time when any fish species that might be present within or below the project area are least likely to be impacted (July 15 – August 31). The culvert replacement at Schnebly Creek would be done when the stream is dry, or if water is present, would utilize a pump-around diversion method during construction to minimize sediment releases downstream. This would involve the placement of temporary sand bag dams upstream and downstream of the work area and a series of pumps to move water from above the upstream dam to below the downstream dam. When the culvert is replaced and properly armored, the dams would be removed and water would be allowed to flow through the new culvert. Prior to final dewatering, any resident fish would be captured in nets and placed upstream of the upper dam. The culverts on Schnebly Creek would be constructed to meet WDFW fish passage guidelines and culvert construction would adhere to in-water work guidelines specified in the Hydraulic Project Approval (HPA) for each crossing.

- Existing access road crossings of streams and riparian areas would be used where possible.

- If blasting, pile driving, or other action producing high-intensity vibrations or shock waves is required within 300 feet of a fish-bearing stream, it would only be conductted during the WDFW-approved work window for protection of eggs and alevins.

- Large rocks or other materials that have been blasted or otherwise introduced into a stream or wetland as a result of tower or road construction would be manually removed so as not to alter stream flow or wetland hydrology (if doing so would not result in disturbance to the channel, bank, or riparian area).

- Trees in riparian areas that must be felled for line clearance or access road purposes would be left within the riparian area or stream as downed woody debris for fish and wildlife habitat (where appropriate) with land owner approval.

- Small trees such as willows and shrubs would be left in place to provide stream shading.

- The contractor would prepare and follow a Spill Prevention Plan to ensure that any spills of hazardous or other materials are properly contained and cleaned up as soon as they happen to prevent materials from entering streams, wetlands, or riparian areas.

- All construction equipment and each active job site would be outfitted with spill containment kits.

- Equipment storage, refueling, and maintenance would not occur within 500 feet of any stream, wetland, or riparian area.

- Construction equipment would be maintained in good working order and would be inspected each day for leaks. If a leak is found, the equipment would be immediately moved to an upland location and repaired.

- Equipment and vehicles used for transport or mixing of concrete would not be rinsed within 500 feet of streams, wetlands, or riparian areas.

- Towers and roads would be located and constructed as far from streams and riparian areas as possible.

- Runoff from construction sites would be minimized by using standard erosion control Best Management Practices (BMPs).

- Drainage systems on access roads would be designed to control runoff and prevent erosion and sedimentation problems.

- Ground disturbance near streams or riparian areas would be minimized by limiting equipment travel and disturbance using "construction envelopes" (areas where equipment is not allowed are marked off with stakes and ribbon).

- If equipment or materials need to be stored temporarily near a construction area, they would be placed on the existing ground surface without removing vegetation. Crushing vegetation is preferable to removing it.

- Revegetation of disturbed sites with native vegetation appropriate to the site would occur as soon as possible after construction is complete. Vegetation would be planted only during appropriate local planting seasons as indicated by USFWS and WDFW.

4.5.11 Cumulative Impacts

The proposed action may contribute to localized, short-term, and long-term disturbance to fish resources, as a result of increased sediment input and possible hazardous materials spills. Erosion and sedimentation of streams within the study area has increased over the past 100 years due to land use practices such as grazing, agriculture, road building, land clearing, military operations, and other disturbances. This has contributed to a reduction in the quality and availability of fish habitat in many streams. Increased access and human activity around streams during this time period has also increased the frequency of hazardous material spills entering streams. While spill events are relatively rare and generally confined to a single stream or stream reach, their effects can be devastating to fish resources.

Riparian vegetation has been significantly reduced from historical levels in Washington, and much of the remaining habitat is heavily disturbed by grazing, fire, and other land uses. Some riparian habitat would be lost as a result of the proposed project, adding cumulatively to the degradation of fish habitat.

4.6 Land Use

For Your Information

The construction, operation, and maintenance of transmission lines and substation facilities can create temporary and permanent impacts on land use. The land uses that are located within transmission line ROWs are limited to those that do not interfere with the line's safe operation and maintenance. For example, no buildings (or other structures) may be built on the ROW, and no flammable materials may be stored there.

4.6.1 Impact Levels

Impacts would be considered **high** where an action would:

- convert active and productive farmlands to a non-farm land uses.
- create areas of non-inhabitable land where residential uses already exist or are permitted.
  - prevent the use of the land according to existing or approved land management plans.

Impacts would be considered **moderate** where an action would:

- adversely affect existing farmlands by limiting farm production or the types of farm uses.
- adversely affect residential properties by eliminating or limiting the potential for residential development to occur around or underneath the transmission lines and/or structures.
- adversely affect commercial or industrial properties by introducing additional or new inconveniences to business operations.
- alter the use of the land according to existing or approved land management plans.

Impacts would be considered **low** where an action would:

- create short-term disturbances such as minor crop damage during construction or restrict improvements to previously affected areas (e.g., existing structure locations).
- create short-term disturbances, but still allow the continued use of the land according to existing or approved land management plans.

No impact would occur when land uses would be able to continue as currently exists.

4.6.2 Impacts Common To Construction Alternatives

Heavy machinery used for construction would temporarily damage crops, compact soils, and disrupt land use activities on approximately 0.3 acre around each structure. Since this disturbance would be temporary and pre-construction conditions would be re-established, the impact level to land uses from construction would be low.

To construct and maintain the proposed transmission line, some existing access roads would need to be improved and new access roads would need to be constructed. The road improvements would occur across lands that support a number of different land uses. Improvements to existing roads would not impact existing land uses. New roads would have a low impact because those within agricultural fields would be temporary, others would be constructed around agricultural fields and residential uses, landowners would be able to use the roads across rangeland and the movement of livestock would not be hindered, and they would not disrupt activities on public land such as the YTC and the Saddle Mountain Unit of the Hanford Reach National Monument.

Table 4.6-1, *Permanent Impacts to Existing Land Uses* and Table 4.6-2, *Temporary Impacts to Existing Land Uses,* provides estimated number of acres that would be used in association with the placement of structures and construction or improvement of access roads, reeling sites, staging areas, and substation by land uses for each alternative. In addition to these impact quantities, there would be some impacts to land uses associated with the presence of overhead conductors.

Table 4.6-1
Permanent Impacts to Existing Land Uses

	Structures, Roads, Reeling Sites, & Substation Impacts (estimated acres)			
Existing Land Use	**Preferred (2)**	**Alternative 1**	**Alternative 3**	**Alternative 1A**
Commercial, Industrial, or Transportation	0.05	0.05	0.05	0.05
Residential	0.35	0.05	0.05	0.05
Forest	0.10	0.10	0.10	0.10
Range	44.40	39.50	175.65	79.00
Agricultural	0.85	3.90	0	0.55
Total	**45.75**	**43.60**	**175.85**	**79.75**

Table has been updated for the FEIS.

Table 4.6-2
Temporary Impacts to Existing Land Uses

	Structures, Roads, Reeling Sites, Staging Areas & Substation Impacts (estimated acres)			
Existing Land Use	**Preferred (2)**	**Alternative 1**	**Alternative 3**	**Alternative 1A**
Commercial, Industrial, or Transportation	2.40	1.25	1.25	1.25
Residential	2.30	1.55	1.55	1.55
Forest	2.10	2.95	3.25	2.10
Range	161.45	174.10	251.20	215.25
Agricultural	22.10	22.05	2.00	2.80
Total	**190.35**	**201.90**	**259.25**	**222.95**

New table for the FEIS.

The area that would become new ROW would have limitations on the types of crops that may be located under the transmission lines. Non-structure supported agricultural crops must be kept at a height of less than 10 feet. As a result, the impact to agricultural lands with these types of crops would be moderate. A special agreement between BPA and the landowner may be reached that allows the growing of ornamental or orchard trees as well as structure supported crops under the transmission lines. If this agreement were in place the impact level would become low.

Rangeland is the highest percentage land use for all alternatives. The existing use of these lands for such things as grazing would be able to continue around the structures and substation facilities, underneath the transmission lines, and over any necessary access roads. Therefore, even though rangeland is the land use with the greatest amount of acres crossed per alternative, the impact level to rangeland would be low.

BOR-administered lands are crossed by Alternatives 1, 1A, and the Preferred Alternative. The BOR manages water resources and maintains and develops water distribution systems, such as irrigation canals, that move water to farmlands. Impacts to BOR land would be low as long as the structures were located in areas that did not disrupt the existing irrigation distribution system or in locations that would not hinder the development of future systems.

All construction alternatives begin at the existing Schultz Substation. There would be no impact from the addition of a new bay and equipment since no new land outside the existing substation boundary is needed.

On all alternatives, approximately 32 miles of fiber optic cable would be installed from the Vantage Substation north to the Columbia Substation, and from the Vantage Substation south to the Midway Substation, roughly 19 miles. The fiber optic lines would cross both private and public lands along existing transmission lines. Construction of the fiber optic lines would use existing access roads and would not require new structures to be placed. During construction, pulling and reeling areas along the alignment would be needed. These sites could be located within agricultural fields, on rangeland or along public roads, creating a temporary disturbance to the specific land use at each pulling and reeling site. However, since the disturbance associated with the fiber optic line would be temporary, the landowners would be compensated for the use of their land, and no new structures or access roads would be required, land use impacts would be low.

4.6.2.1 Aircraft Safety

The Federal Aviation Administration (FAA) is responsible for oversight of air safety in the United States and issues Federal Aviation Regulations (FAR) regarding marking and lighting of potential obstructions to air navigation. The regulations call for marking and/or lighting any temporary or permanent object that is taller than 200 feet (61 m) above ground level or that exceeds the obstruction standard contained in FAR Part 77, Subpart C. Certain obstructions may not require marking and/or lighting if a FAA aeronautical study indicates they do not impair aviation safety.

FAA regulations also require notification of construction or alteration in buffer zones around airports, including military airports. An airport with runways less than 3,200 feet requires a buffer of 10,000 feet; for runways greater than 3,200 feet, a 20,000-foot buffer is required. Within these buffers the FAA has set standards for the height of objects and notification to the FAA of construction or alteration is required.

Options to meet the FAA safety standards are routing the transmission line outside the buffer zone, using low-profile towers, placing the line underground in the affected area, or marking and/or lighting the towers and/or conductors.

General BPA policy is to follow FAA recommendations with respect to airway marking and lighting near all airports.

Overhead transmission lines represent a hazard to low-flying aircraft such as those used in the military training exercises conducted at the YTC. Segments A and B would parallel existing transmission lines as they cross the YTC. Segment C would cross the YTC in areas where no transmission lines currently exist.

On the YTC overhead transmission towers and conductors would pose a hazard and affect the ability to operate the low flying aircraft (helicopters, F-18s, and A-10s). These aircraft are used for training and ground support during training exercises conducted on the YTC. The towers and conductors would also affect the parachute drops used to bring in supplies during maneuvers.

To reduce the profile of the proposed line where it crosses the YTC, the proposed towers and conductors in the YTC will be at a lower height above ground than elsewhere along the route. This is accomplished by orienting the conductor bundles in a flat configuration at the same height above the ground. Two overhead ground wires are located above the conductor bundles. This design results in a lower profile for the transmission line than does the standard delta (triangular) configuration with overhead ground wires used elsewhere.

In the YTC standard airway marker balls would be installed on the overhead ground wires to enhance visibility of the conductors. At present the technology for lighted marker balls is not reliable.

4.6.3 Preferred Alternative (Alternative 2)

The Preferred Alternative would include Segment A, Segment B (Option B_{SOUTH}), Segment D, and the fiber optic line.

4.6.3.1 Segment A

Reminder

In Segment A, the new and existing transmission lines would have a separation of up to 1,375 feet.

A small portion of Segment A, roughly 0.5 mile (2 percent), would cross agricultural lands. The agricultural land along this segment is predominantly dryland farming with hay or wheat as the prime crop. Due to the very limited amount of agricultural lands along this segment, it is anticipated that there would be no temporary impacts to agricultural lands – the transmission line structures could span the agricultural lands and no access roads or reeling sites would be located on agricultural lands.

Along the north side of the existing transmission line there is an area of lots that contain log cabin residences that would be crossed by the proposed segment. The impact to these residential uses and properties would be high. Locating the segment across the planned subdivision area would alter the development by reducing the number of residential units. The impact to residential land uses would be high.

A commercial quarry operation near the Vantage Highway would be crossed by Segment A. Structure locations may be designed to have a moderate impact on the quarry by placing them outside the area of use. Impacts to quarry operations would also be moderate as long as facility operations were able to continue within and across the transmission line right-of-way.

Both options of the Sickler-Schultz Reroute, at the north end of Segment A, would cross rangelands. As previously described, impacts to rangeland would be low.

A small portion of Segment A, including a limited amount of Options 1 and 2 of the Sickler-Schultz Reroute, approximately 2.7 miles (9 percent) would traverse lands administered by the DNR. The land in the area of this segment is considered transition lands by DNR and is used as rangeland for livestock. As with all rangeland crossed by the various segments, the impact to this land use would be low since the use activities would be able to continue relatively uninterrupted.

An even smaller portion of Segment A, roughly 0.9 miles (3.2 percent), would traverse lands administered by the BLM. This land is also used as rangeland and, again, the impact to this land use would be low since the use activities would be able to continue relatively uninterrupted.

The southern end of this segment crosses the northern border of the YTC and continues through the Middle Canyon Complex of the YTC for roughly 5.8 miles before it ends just inside the northern border of the Johnson Creek Complex. The U.S. military conducts armor and mechanized infantry movements, tanks and other vehicle movements, and force-on-force maneuver exercises in these two complexes. The existing Schultz-Vantage line that Segment A would parallel was in place prior to this land area becoming part of the YTC. As a result, the military has tailored the type of maneuvers that occur in these two complexes so that the presence of these transmission lines only slightly restricts the maneuverability of the military units. However, a new transmission line parallel to but 1,200 feet away from the existing lines would create additional long-term impacts to the military training mission and would have an impact on land use and land use planning on the installation. Therefore, the impact to the YTC in this area would be moderate.

Reminder

*A **complex** is a specific watershed area within the YTC. The YTC is divided into ten complexes.*

4.6.3.2 Segment B

The Preferred Alternative would follow Option B_{SOUTH} of Segment B. Option B_{NORTH} would not be used for this alternative.

Option B_{SOUTH} – Option B_{SOUTH} would traverse roughly 7.3 miles (77.5 percent) of the Johnson Creek Complex of the YTC with the remaining portion traversing rangeland and open water.

The impact to rangeland would be low. There would be no impact to open water crossed because the transmission line would span water bodies.

The existing transmission lines that Segment B would parallel immediately adjacent to through the Johnson Creek Complex were in place prior to this land area becoming part of the YTC. The U.S. military has tailored its use of this area to accommodate these existing transmission line facilities. Since the new transmission line would be adjacent to an existing line, the impacts to the YTC along B_{SOUTH} would be low.

Option B_{NORTH} – The majority of B_{NORTH}, roughly 7.0 miles (77 percent), traverses the Johnson Creek Complex of the YTC with the remaining portion traversing rangeland and open water.

The impact to rangeland would be low. There would be no impact to open water crossed because the transmission line would span water bodies.

As with Segment A, the existing transmission lines that Segment B would parallel through the Johnson Creek Complex, at a distance of 1,200 feet, were in place prior to this land area becoming part of the YTC. The U.S. military has tailored its use of this area to accommodate these existing transmission line facilities. Still, the new lines would create additional long-term impacts to the military training mission and would have an impact on land use and land use planning on the installation. Therefore, the impact to the YTC in this area would be moderate.

4.6.3.3 Segment D

Reminder

The first number in BPA structure numbers is the transmission line mile and the second number is the structure in that mile.

Segment D would parallel or replace the existing Midway-Vantage 230-kV line and parallel the Midway-Big Eddy 230-kV line from the Vantage Substation to the new Wautoma Substation (about 26.7 miles). The portion of the segment that would replace a single-circuit 230-kV line with a double-circuit 230/500-kV line would traverse an agricultural area located in Grant County, south of the Saddle Mountain ridge and north of the Columbia River. The double-circuit portion from structure 11/1 to 2/4, a total of 8.0 miles, would minimize the impact to the agricultural fields. The existing crops are expected to continue to be grown underneath the transmission lines.

The remaining agricultural lands crossed by Segment D are located in Benton County south of Umtanum Ridge and north of Cold Creek. Through this area, which consists mainly of vineyards and orchards irrigated using canals rather than circle irrigation, Segment D would parallel the existing Midway-Big Eddy line. Impacts to agricultural land would be minimized by locating new structures on the edges of fields, vineyards, or existing roads. The impact to agricultural lands south of Umtanum Ridge would be high because of the loss of farm land.

The total miles of agricultural land crossed by Segment D would be approximately 8.8 miles. Double-circuiting and the placement of structures at the edge of fields or roads in the remaining agricultural areas would result in a moderate impact to agricultural uses. However, 0.85 acres of permanent impacts to agricultural lands are still anticipated along this segment. Therefore, even though the total quality of agricultural land being affected is relatively limited, the impact to this land would be high due to the land being converted from its agricultural use.

The Preferred Alternative would terminate at the new Wautoma Substation. BPA would acquire approximately 47 acres of rangeland for this facility. Of the 47 acres, roughly 10 acres would be used for the substation, the remaining 37 acres would continue as rangeland.

Residential uses along the double-circuit section would not be impacted. Residential uses would continue in their present location. North of the double-circuit section and Lower Crab Creek, southeast of Beverly, Washington, are two residences along the west side and within 200 feet of the existing transmission line. The northern most residence would need to be removed to construct the new transmission line. The impact to residential land uses would be high.

Less than one mile of Segment D would cross through a section of the Columbia National Wildlife Refuge located on the north side of the Saddle Mountains and along the south side of Lower Crab Creek. Paralleling an existing transmission line through this area would result in a moderate impact due to some loss and degradation of wildlife habitat, increased fragmentation, and increased human disturbance to wildlife.

Segment D would cross approximately 2.9 miles of the western end of the Saddle Mountain Management Area. This land is located north of the agricultural areas in Grant County. BLM manages this land for multiple land uses, such as mineral resources, rangelands, recreation, and wildlife habitat. The area crossed by this segment is used predominantly as rangeland with some off-road vehicle recreational use. As with all rangeland crossed by the various segments, the impact to this land use would be low since the uses would be able to continue relatively uninterrupted. The impact to off-road vehicle use would also be low as vehicles would be able to move under and around the transmission line. One of the six management objectives of the Saddle Mountain Management Area is to keep public lands open for purposes such as rights-of-way. The overall impact to land uses on BLM lands would be low.

Segment D would cross a small portion of DNR-administered land, approximately two miles (7.5 percent). Roughly 1 mile of this land is used for agricultural purposes and would be in the area of the double-circuiting. The impact to this agricultural land would be low. The remaining portion of DNR land is predominantly rangeland. The overall impact to DNR lands would be low.

Reminder

The land use designation Preservation on the Hanford Reservation is intended to provide protection for sensitive areas or species of concern from impacts associated with intensive land-disturbing activities.

USDOE *is the U. S. Department of Energy.*

Segment D would also cross a small portion of the Saddle Mountain Unit of the Hanford Reach National Monument before crossing the Columbia River into Benton County and continuing south through the west side of the Monument. This area has a land designation of Preservation according to the USDOE Comprehensive Land Use Plan and EIS. The policies of the Final Hanford Comprehensive Land Use Plan and EIS state that existing utility corridor rights-of-way are the preferred routes for expanded capacity. However, Segment D would expand an existing ROW by 150 feet and require new transmission towers to accommodate the new line. Even though the total quantity of Preservation lands being affected is relatively limited, the impact to this land would still be high because a loss and degradation of wildlife habitat, increased habitat fragmentation, and increased human disturbance to wildlife would occur. As a result, the impact to the Preservation area of the Saddle Mountain Unit of the Hanford Reach National Monument would be high. (See Table 4.6-3, *Preferred Alternative – Land Use Impacts*.)

4.6.3.4 Fiber Optic Line

For the Preferred Alternative, an additional fiber optic line would be constructed from the Midway Substation to the new Wautoma Substation and back. As with the fiber optic line from the Vantage to Midway and Vantage to Columbia Substation, impacts from the Midway to Wautoma fiber optic line would be low since the impacts would be temporary, landowners would be compensated for use of their land, and no new structures or access roads would be required.

Table 4.6-3
Preferred Alternative – Land Use Impacts

Land Use	Impact Level	Main Issue
Agricultural	High	Conversion of farmlands to non-farmland use
Residential	High	Log cabin vacation residences and planned 200-acre subdivision, and removal of one residential trailer.
Range	Low	Current use able to continue
Quarry	Moderate	May affect quarry operations
BLM	Low	Rangeland and recreational uses
DNR	Low	Rangeland and Agricultural land crossed by double-circuit construction method and rangeland
YTC	Moderate/Low	Military maneuvers already structured around the presence of existing transmission lines
USFWS	Moderate	Disturbance to wildlife and wildlife habitat
Hanford Reach National Monument	High	Impacts area of refuge for wildlife by expanding an existing utility corridor through an area designated for Preservation
Overall Impact from Preferred Alternative MODERATE		

Table has been updated for the FEIS.

4.6.4 Alternative 1

Alternative 1 would include Segment A, Segment B (Option B_{SOUTH}), Segment E, and the fiber optic line between the Vantage and Columbia Substations.

Impacts to land use along Segments A, B, and the fiber optic line would be the same as described for the Preferred Alternative. (See Section 4.6.3.1, *Segment A* and Section 4.6.3.2, *Segment B*).

Reminder

Segments A and B would have the following land use impacts:
Residential: High
Quarry: Moderate
BLM: Low
DNR: Low
YTC: Moderate/Low

4.6.4.1 Segment E

Segment E crosses approximately 4.8 miles (19 percent) of agricultural land. Segment E would parallel an existing transmission line through agricultural areas. Impacts to agriculture could be reduced by constructing new access roads along the edges of agricultural fields and by locating structures at the edges of fields or between crop circles. Even with these measures, it would not completely eliminate the conversion of agricultural land to a non-agricultural use. Therefore, the impact to agricultural lands would be high.

In Segment E, the new and existing transmission lines would have a separation of approximately 1,200 ft.

Roughly one mile of Segment E would cross through a section of the Columbia National Wildlife Refuge located on the north side of the Saddle Mountains and along the south side of Lower Crab Creek. Paralleling an existing transmission line through this area would result in a moderate impact due to some loss and degradation of wildlife habitat, increased fragmentation, and increased human disturbance to wildlife.

Segment E would also cross a small portion of DNR administered land that is used predominantly for agricultural purposes. This land, approximately 0.6 mile, would experience the same impacts as the rest of the agricultural land. Therefore, impacts to DNR lands would be high.

There would be two residential structures located between the existing transmission line and Segment E. There would also be two separate residential compounds located between the two transmission lines. In one compound the structures would be over 200 feet from Segment E; the other compound would have structures within 200 feet of the transmission line. Locating the structures as far away from the compound as possible would allow the land use to continue. The impact to residential land uses would be low.

Segment E would parallel the existing Vantage-Hanford line through approximately 4.9 miles of BLM-administered land. This land is located north of the agricultural areas in Grant County and is the western end of the Saddle Mountain Management Area. BLM manages this land for multiple land uses, such as mineral resources, rangelands, recreation, and wildlife habitat. The area crossed by this segment is used predominantly as rangeland and wildlife habitat with some off-road vehicle recreational use. As with all rangeland crossed by the various segments, the impact to this land use would be low since the uses would be able to continue relatively uninterrupted. The impact to off-road vehicle use would also be low as the vehicles would be able to continue operating under and around the transmission facility. One of the six management objectives of the Saddle Mountain Management Area is to keep the public lands open for purposes such as rights-of-way. The impact to land uses on BLM lands along Segment E would be low.

For Your Information

The land use designation Preservation on the Hanford Site is intended to provide protection for sensitive areas or species of concern from impacts associated with intensive land-disturbing activities.

Segment E would cross the Saddle Mountain Unit of the Hanford Reach National Monument before crossing the Columbia River and terminating at the existing Hanford Substation, which is approximately one-quarter mile from the Columbia River, on the Hanford Site. The area crossed by Segment E has a land use designation of Preservation according to the USDOE Comprehensive Land Use Plan and EIS. The policies of the Final Hanford Comprehensive Land Use Plan and EIS state that existing utility corridor rights-of-way are the preferred routes for expanded capacity. Segment E would be a new utility corridor 1,200 feet north of an existing transmission line. The new corridor would result in a loss and degradation of wildlife habitat, increased habitat fragmentation, and increased human disturbance to wildlife. As a result, locating Segment E through this area would have a high impact on the effort to preserve the ecological, archaeological, cultural, and natural resources of the area as well as the effort to use this area as a refuge for wildlife.

Alternative 1 would terminate at the existing Hanford Substation. There would be no impact from substation work since no new land outside the existing substation boundary would be needed.

The evaluation of impacts to various land uses shows Alternative 1 would have a high impact on agricultural and residential land uses. Alternative 1 would have a high impact to DNR and USDOE land, which is managed by the USFWS. The DNR land covered is predominantly agricultural. Alternative 1 would convert some agricultural land to a non-agricultural use. Alternative 1 would create a new corridor through an area designated as Preservation by USDOE. (See Table 4.6-4, *Alternative 1 – Land Use Impacts*.)

Table 4.6-4
Alternative 1 – Land Use Impacts

Land Use	Impact Level	Main Issue
Agricultural	High	Conversion of farmlands to non-farmland use. Double-circuiting not an option.
Residential	High	Log cabin vacation residences and planned 200-acre subdivision. Towers could be located to minimize impact.
Range	Low	Current use able to continue
Quarry	Moderate	May affect quarry operations.
BLM	Low	Rangeland, recreational uses, and wildlife habitat.
DNR	High	Predominantly agricultural land.
YTC	Moderate/Low	Military maneuvers already structured around the presence of existing transmission lines.
USFWS	Moderate	Disturbance to wildlife and wildlife habitat
Hanford Reach National Monument	High	Impacts area of refuge for wildlife by constructing a new utility corridor through an area designated for Preservation.
Overall Impact from Alternative 1: HIGH		

Table has been updated for the FEIS.

4.6.5 Alternative 3

Alternative 3 would include Segment A, Segment C, and the fiber optic line.

Impacts to land use along Segment A and the fiber optic line would be the same as described for the Preferred Alternative. (See Section 4.6.3.1, *Segment A*).

For a discussion of land use impacts associated with Segment A, please see Section 4.6.3.1, *Segment A*.

Reminder

Segment A would have the following land use impacts:
Residential: High
Quarry: Moderate
BLM: Low
DNR: Low
YTC: Moderate/ Low

Reminder

Training maneuvers that occur in the complexes crossed on the YTC include force-on-force maneuver exercises; light infantry maneuvers and small unit operations; live fire artillery, gunnery, and mortar training; and live fire training for infantry units, tanks, and helicopters.

For this document, agriculture is defined as row crops, pasture, fallow fields, orchards, crops and grains. Land that we refer to as rangeland is grassland and shrubland that may be used for grazing or the movement of livestock.

4.6.5.1 Segment C

About 24.3 miles (80.8 percent) of Segment C is located on the YTC. Beginning where Segment A ends, this segment heads south through the Johnson Creek, Hanson, Alkali Canyon, Corral Canyon, and Cold Creek Training Complexes before exiting from the southeast corner of the YTC. Due to the steep slopes in the Alkali Canyon and Corral Canyon, supplies and support materials for maneuvers are delivered to exercises in the area via parachute drops.

When the military needs to run power to its training areas where live gunnery, artillery, and mortar fire training occurs, which is a stated use in three of the five complexes crossed by this segment, the military has a standing practice of burying their utility lines through those areas. Aboveground transmission lines would eliminate the ability to conduct live mortar fire exercises.

Overhead transmission lines would also affect the ability to operate low-flying aircraft (helicopters, F-18s, and A-10s) that are used as ground support and the parachute drops used to bring in supplies. The presence of a transmission line would force ground maneuvers to work around the structures, which would break up the continuity of the maneuvers and reduce their effectiveness.

Unlike Segments A, B_{NORTH}, and B_{SOUTH}, Segment C would be a new transmission line in an area where training maneuvers are not currently set up to work around such facilities. It would eliminate the ability to have live gunnery, artillery, and mortar training and have a high affect on aviation and ground maneuvers. As a result, Segment C would have a high impact on the land uses in the YTC.

The portion of Segment C not located on the YTC crosses private rangeland and a small portion of rangeland administered by DNR (less than 0.5 mile) and BLM (about 0.2 mile). As with all rangeland crossed by the various segments, the impact to this land use would be low since the uses would be able to continue relatively uninterrupted.

Since the majority of Segment C would be located within the YTC, and would have such a high level of impact on military operations and maneuvers, the overall impact on land use for this segment would be high. (See Table 4.6-5, *Alternative 3 – Land Use Impacts*.)

Alternative 3 would terminate at the new Wautoma Substation. BPA would acquire approximately 47 acres of rangeland. Of the 47 acres, roughly 10 acres would be used for the substation, the remaining 37 acres would continue as rangeland.

4.6.5.2 Fiber Optic Line

Like the Preferred Alternative, Alternative 3 would include the construction of additional fiber optic lines from the Midway Substation to the new Wautoma Substation and back. Impacts from the fiber optic line would be low since the impacts would be temporary, landowners would be compensated for use of their land, and no new structures or access roads would be required.

Table 4.6-5
Alternative 3 – Land Use Impacts

Land Use	Impact Level	Main Issue
Residential	High	Log cabin vacation residences and planned 200-acre subdivision
Range	Low	Current use able to continue
Quarry	Moderate	May affect quarry operations
BLM	Low	Rangeland
DNR	Low	Rangeland
YTC	High	Live gunnery, artillery, and mortar fire training, aviation maneuvers, and ground maneuvers
Overall Impact from Alternative 3: HIGH		

Table has been updated for the FEIS.

4.6.6 Alternative 1A

Alternative 1 would include Segment A, Segment B (Option B_{SOUTH}), Segment F, and the fiber optic line between the Vantage and Columbia Substations.

Impacts to land use along Segments A and B (Option B_{SOUTH}) would be the same as described for the Preferred Alternative. (See Section 4.6.3.1, *Segment A* and Section 4.6.3.2, *Segment B*).

Reminder

Segments A and B would have the following land use impacts:
Residential: High
Quarry: Moderate
BLM: Low
DNR: Low
YTC: Moderate/Low

4.6.6.1 Segment F

Transmission structures and access road improvements along Segment F would permanently impact less than one acre of agricultural land. By locating the structures and new access roads at the edge of fields, these impacts could be reduced. Still, some agricultural lands would be converted from an agricultural use to a non-agricultural use; therefore, the impact to agricultural lands would be high.

There would be a small portion of DNR-administered land crossed by Segment F, approximately 2.5 miles (7.8 percent). This land is predominantly rangeland. As it is on all line segments, the impact to rangeland would be low.

A large portion of Segment F, roughly 12.8 miles (39.2 percent), of the total segment, would run east-west through the Saddle Mountain

Management Area administered by BLM. This segment would traverse nearly the entire length of this management area within new ROW. BLM manages this land for multiple land uses, such as mineral resources, rangelands, recreation, and wildlife habitat. The types of land use activities occurring in the area would be able to continue relatively uninterrupted under and around the new line. One of the six management objectives of the Saddle Mountain Management Area is to keep public lands open for purposes such as rights-of-way. As a result, the impact to land use activities on BLM lands would be low.

Reminder

The land use designation Preservation on the Hanford Reservation is intended to provide protection for sensitive areas or species of concern from impacts associated with intensive land-disturbing activities. The policies of the Final Hanford Comprehensive Land Use Plan and EIS state that existing utility corridor rights-of-way are the preferred routes for expanded capacity.

Segment F would cross the Wahluke Unit and the Saddle Mountain Unit of the Hanford Reach National Monument before crossing the Columbia River and terminating at the existing Hanford Substation, which is approximately one-quarter mile south of the Columbia River. The area crossed by Segment F has a land use designation of Preservation according to the USDOE Comprehensive Land Use Plan and EIS. The policies of the Final Hanford Comprehensive Land Use Plan and EIS state that existing utility corridor rights-of-way are the preferred routes for expanded capacity. Segment F would require new ROW 1,200 feet east of the existing Grand Coulee-Hanford line. The new corridor would result in a loss and degradation of wildlife habitat, increased habitat fragmentation, and increased human disturbance to wildlife. As a result, Segment F would have a high impact on the effort to preserve the ecological, archaeological, cultural, and natural resources of the area as well as the effort to use this area as a refuge for wildlife.

The impact to agricultural lands and the Wahluke Unit and the Saddle Mountain Unit of the Hanford Reach National Monument would be high. However, due to the limited amount of agricultural lands that will experience a high impact (just 1 percent of the total lands in Segment F), and because the Hanford Reach National Monument lands are just over one-third of the total lands crossed by the segment, the overall impact to land uses from Segment F would be moderate to high. (See Table 4.6-6, *Alternative 1A – Land Use Impacts*.)

Alternative 1A would terminate at the existing Hanford Substation. There would be no impact from substation work since no new land outside the existing substation boundary would be needed.

Table 4.6-6
Alternative 1A – Land Use Impacts

Land Use	Impact Level	Main Issue
Agricultural	High	Conversion of agricultural land to non-agricultural land use
Residential	High	Log cabin vacation residences and planned 200-acre subdivision
Range	Low	Current use able to continue
Quarry	Moderate	May affect quarry operations
BLM	Low	Rangeland, recreational uses, and wildlife habitat
DNR	Low	Rangeland
YTC	Moderate/Low	Military maneuvers already structured around the presence of existing transmission lines
Hanford Reach National Monument	High	Impacts area of refuge for wildlife by constructing a new utility corridor through an area designated for Preservation
Overall Impact from Alternative 1A: MODERATE		

Table has been updated for the FEIS.

4.6.7 No Action Alternative

The impacts currently associated with the ongoing operations and maintenance activities for the existing transmission line, substations, and ROW would continue. However, under this alternative, no new impacts to land uses would be expected.

4.6.8 Recommended Mitigation

- Work closely with the various land managers and landowners to minimize conflicts and inconvenience from construction and maintenance activities.
- Locate the new line as far away from residential and commercial land uses as possible.
- Locate structures outside of agricultural fields and on the edges of existing roads where possible or next to existing structures.
- Construct new permanent access roads around agricultural fields and in locations that may benefit the landowner.
- Schedule activities to avoid or minimize crop damage.
- Keep gates and fences closed and in good repair to contain livestock.
- Compensate farmers for crop damage, help them control weeds and restore compacted soils.
- Enter into special agreements with landowners to allow the growing of ornamental or orchard trees as well as other structure-supported crops under the transmission lines.
- Strive to meet substantive requirements of Benton, Grant, Kittitas, Yakima and Douglas County development regulations.

4.6.9 Cumulative Impacts

The expansion of utilities and other non-agricultural land uses would lead to further removal of valuable agricultural lands and rangelands from production, resulting in an incremental increase in lands lost to previous development and to future development that were not necessarily intended to be used for utilities.

This region of Washington, especially Kittitas County due to its proximity to the Seattle urban area, is experiencing an increase in new rural residential structures being constructed by people seeking the benefits of rural living and as vacation homes or resort destinations. As the rural areas are developed for purposes other than agricultural, more people will be living in proximity to the transmission lines. Expanding utility infrastructure in these areas will continue to cause conflicts with various land uses.

Expanding the transmission system in this region may also contribute to the gradual urbanization of the rural landscape. As more power becomes available, areas may begin to experience an increase in development. This new development would impact agricultural and range lands by decreasing the quantity of this land available for production.

The miles of improved and new access roads, necessary in order to gain access to transmission lines during maintenance and repair activities, would provide increased access opportunities to areas previously inaccessible by motorized vehicles. These new roads could lead to increased recreational activities such as hunting, wildlife viewing, and off-road vehicle operating in areas unaccustomed to such activities. This increased activity would impact the existing use of the land for preservation or natural habitat purposes.

Aside from increased access opportunities into certain preservation areas, establishing a new ROW through an area such as the Saddle Mountain Unit of the Hanford Reach National Monument may make it easier to construct future lines through the same corridor. As the number of transmission lines through the area increases, the ability to successfully preserve the ecological, archaeological, cultural, and natural resources of the area may decrease.

4.7 Socioeconomics

4.7.1 Impact Levels

A **positive** impact would occur when an alternative produces one or more of the following effects: provides employment, increases tax revenues, increases property values, or creates other similar effects on the social and economic vitality of affected communities.

A **negative** impact would occur when an alternative produces one or more of the following effects: reduces employment, reduces a tax base, takes land out of production without compensation, exceeds current capacities for housing and public services, or creates other similar effects on the social and economic vitality of affected communities.

No impact would occur if employment levels, tax revenues, property values, land production, demand for housing and public services, or other similar effects remain unchanged or if impacts would be of short duration.

4.7.2 Population

Constructing a new transmission line would not encourage population growth in the area, but rather would be a response to growth that is already occurring in central Washington and the Pacific Northwest. The local population has not and would not increase because of the availability of electric power. However, population growth would likely slow and could decline if transmission system capacity is not increased. (See also Section 4.7.12, *No Action Alternative*.)

From an assessment of ***demographic*** data and aerial photography, it has been determined that places where minority and low-income populations may reside, work, or otherwise spend large parts of their days are not highly or disproportionately concentrated within the study area. None of the alternatives would have a detrimental effect on minorities or economically disadvantaged groups in the area. (See also Section 5.8, *Executive Order on Environmental Justice*.)

No impact to the population would occur as a result of the proposed project.

4.7.3 Economy and Industry

Because transmission line construction requires specialized labor, construction crews would likely be brought in from outside the local area. Specialized workers may come from outside the region such as

For Your Information

*In addition to positive and negative impacts, **short-term socioeconomic impacts** include those created by an influx of construction workers into a local area and the additional tax monies generated.*

***Long-term socioeconomic impacts** include the value of any agricultural crops taken out of production, interference with agricultural practices, reductions in the taxable land base, and the perceived effects on property values from new transmission and substation facilities.*

Demographic *information relates to the dynamic balance of a population, especially with regard to density and the capacity for expansion or decline.*

Reminder

The only portion of the project that crosses lands within Douglas County is the fiber optic line for roughly 5 miles. No socioeconomic issues would arise and no impacts would occur since the fiber optic line would be installed on existing structures and construction equipment would use existing roads.

Spokane or Seattle, Washington; Portland, Oregon; Boise, Idaho; or from other parts of the United States or the world. The primary construction contractor may hire local contractors to fill less specialized roles such as roadwork and ROW clearing.

Construction would likely occur over one year, with one or two primary contractors. About 100 people would be needed to construct a project of this scale on this timeline. This would be a positive impact on employment in general, but not necessarily a local impact if workers do not come from the study area.

Constructing a new transmission line would not impact the distribution of jobs within industry sectors, personal and household incomes, or industry earnings.

4.7.4 Housing and Public Services

Socioeconomic impacts to temporary housing facilities are relatively minor for transmission line construction projects in most areas. Most construction workers would likely provide their own housing (e.g., campers and trailers) or seek temporary commercial lodging. Recreational vehicle (RV) parks are available throughout the area. These facilities are typically available by the day, week, month, or season. Because of the relatively small number of construction crews who would build the project, there should be few negative impacts to the temporary housing supply in the area.

Two residences would be relocated as a result of the Preferred Alternative. One residence is along Segment A and one residence is along Segment D. Both displacements would be conducted in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act (See also Section 5.9, *Displacements and Real Property Acquisition*.).

Impacts to public services such as police, fire, and medical response, would be of short duration during the construction phase. Impacts to the two residences would be negative.

4.7.5 Retail Sales and Use Tax

The major cost of any transmission line project is labor and materials. A combined state and local sales and use tax would be levied on materials purchased for the project by the contractor. Although BPA, as a federal agency, is exempt from Washington state taxes, they agree to pay a fee to the counties based on the materials purchased for the project. This fee is generally 7.8 percent, or approximately $2,400,000. This would be a positive impact to local and state revenues.

The sales and use tax would also be assessed on incidental purchases by the contractor, crews, and subcontractors. Because crews would be in the area only temporarily, incidental purchases would be limited to provisions such as food (tax exempt), lodging, fuels, tools, clothing, and other minor purchases. These purchases would be in small amounts and any sales or use tax collected would be a positive but minor impact.

4.7.6 Business and Occupation Tax and Public Utility Tax

For Business and Occupation (B&O) tax purposes, contractors performing work for BPA are classified as government contractors and are subject to the B&O tax. The gross contract price is subject to this tax. Therefore, the Preferred Alternative would generate about $145,000 in B&O tax. Other alternatives would result in similar amounts of tax. This would be a positive impact to state revenues.

Final distribution of a utility is subject to the public utility tax. BPA is exempt from this tax; thus no impact to the state or local revenues would result.

4.7.7 Property Tax

BPA, as a federal agency, is exempt from paying local property taxes. None of the alternatives would impact local property tax revenues, except in the case of acquiring real property to build a new substation.

The Preferred Alternative and Alternative 3 would terminate at a new substation site. Any land purchased by BPA to construct a new substation would reduce the taxable land base. The extent of this reduction is approximately <u>47</u> acres for the substation and would be for the duration of the facility, which is about 50 years. The <u>loss of</u> tax revenues for this acreage reduction would have a small negative impact on <u>Benton County</u> and to an even lesser extent on the state school fund.

Alternatives 1 and 1A would terminate at the existing Hanford Substation, which would be expanded to make room for an additional bay. Enough land is already available and owned by BPA to expand this substation. No additional land would be needed at Schultz, Vantage, or Midway Substations. Therefore, no impact to local or state property tax revenues would occur.

4.7.8 Property Value

Any new transmission line or access road easements would be appraised, and landowners would be offered the fair market value for these land rights. Some short-term adverse impacts on property value and salability along the new ROW may occur on individual properties. However, these impacts are highly variable, individualized, and unpredictable. The new line is not expected to cause overall long-term adverse effects on property values. See Appendix E, *Property Impacts*, for more information on impacts to property values.

4.7.9 Land Taken Out of Production

Activities such as farming, that do not interfere with the transmission line or endanger people, are usually not restricted.

In cases where productive lands cannot be avoided, some land may be taken out of production. This includes the placement of structures in productive lands, reduction in irrigated land use (i.e., reconfigured irrigation circles), and locating the new Wautoma Substation in productive land. Constructing new towers in productive lands and changes to existing irrigation circles would have a negative impact on individual landowners. Locating the new Wautoma Substation in productive lands would take up to 47 acres of land out of production; a negative impact to taxable land base. Landowners would be compensated for any lands taken out of production.

4.7.10 Fiber Optic Line

Socioeconomic impacts resulting from the Vantage-Columbia fiber optic line would be minimal. No impacts to population, economy, housing and public services, and property value would be anticipated. Additional tax revenue may be generated through contractors' taxable expenditures and B&O tax on the contract value.

Reminder

Excise *taxes are internal taxes imposed on the production, sale, or consumption of a commodity or the use of a service.*

4.7.11 Other Taxes

Other state taxes that would be assessed include ***excise*** taxes on fuel, cigarettes, tobacco products, liquor, timber, and rental cars. Local excise taxes that would be applicable to the project include hotel/motel taxes and municipal taxes and licenses. The contractor, crews, and subcontractors would likely bear the expense of these taxes. Revenues generated from these miscellaneous taxes would have a positive impact on state and local revenues, but are expected to be small due to the limited crew size involved in this type of construction.

Sales of privately owned property to BPA for a new substation or for right-of-way would not be subject to real estate tax. This is based on WAC 458-61-420(1)(c), which states that excise tax does not apply to "Transfers to the United States, the state of Washington, or any political subdivision thereof, or a municipal corporation, either under threat of eminent domain or as a result of the actual exercise of eminent domain." Local real estate revenues generated by the project would have a small negative impact on local counties because the property acquired by BPA would not be available for transfers that would generate real estate tax.

4.7.12 No Action Alternative

The No Action Alternative would not directly or indirectly impact the local population, economy, or tax base. However, this alternative would have other socioeconomic impacts to the local area and greater region, as a result of the lack of adequate transmission line infrastructure to support expected growth in the Pacific Northwest. The lack of transmission capacity could cause seasonal localized power deficiencies. The development of clean power generation in areas that can support it may be offset by combustion generation closer to load centers.

The No Action Alternative would potentially have negative socioeconomic effects in the greater Pacific Northwest region.

4.7.13 Eminent Domain

BPA has the power of eminent domain, or the power to condemn landrights needed to support its projects. If, after good faith negotiations, BPA and a landowner are not able to agree on terms of a purchase, BPA would ask the U.S. Department of Justice to begin condemnation proceedings in U.S. District Court on behalf of BPA (See Appendix K, *Condemnation*, for a broader description of the condemnation process.). A landowner may request that the condemnation process be used if they are not willing to negotiate.

4.7.14 Recommended Mitigation

- BPA would compensate private landowners for the fair market value of any landrights needed.
- BPA would work with landowners and land managers to site the new line to minimize impacts and land taken out of production.
- BPA or the landowner could elect to utilize the condemnation process if they are not able to agree on terms of purchase.

- BPA would comply with the Uniform Relocation Assistance and Real Properties Acquisition Policies Act.

4.7.15 Cumulative Impacts

It is unclear whether the introduction of more transmission capacity would be a catalyst to population growth. Other infrastructure (such as water or sewer), local economies, and employment opportunities would play an important role in whether an area can absorb population increases. The alternatives could contribute, along with other factors, to increased growth in the region.

4.8 Visual Resources

Potential impacts to visual and aesthetic resources consist of a combination of changes in the visual environment and their effect on viewers who are sensitive to these changes. Transmission line projects are generally not perceived as providing visual enhancement to the landscape. However, they can be built in ways that minimize visual impacts so that their benefits (i.e., improved service reliability, increased transmission capacity, and new jobs) can be realized.

Reminder

Visually sensitive locations have been identified based on their visual quality, uniqueness, cultural significance, or viewer characteristics (Sevi, 1986).

The following analysis discusses areas that are considered typical to this project, for which visual simulations have been created. Three locations within the project area were determined to be Visually Sensitive Locations. Visual simulations were also created for these sensitive locations and the viewpoint for each is shown on Map 10, *Visual Analysis*.

4.8.1 Impact Levels

Although the visual resource impacts of transmission line projects are not locally regulated within the study area, the construction of a new transmission line will change the physical appearance of the landscape and affect viewer groups. To assess the visual impacts of this project, the following criteria were used.

Impacts would be considered **high** where:

- the transmission line(s) would become a view's dominant feature or focal point.
- a large number of highly sensitive viewers would see the line(s) in predominantly the ***foreground*** and ***middleground***.

__Foreground__ is within 0.25 to 0.5 mile of the viewer.

__Middleground__ is from the foreground to about 5 miles from the viewer.

Impacts would be considered **moderate** where:

- the transmission line(s) would be clearly visible but not the dominant feature of the view.
- a large number of sensitive viewers would see the line(s) mostly in the middleground.

Impacts would be considered **low** where:

- the transmission line(s) would be somewhat visible but not evident in the view.
- few sensitive viewers would see the transmission line(s) because they would be either screened or predominantly seen in the middleground and ***background***.

__Background__ is more than 5 miles from the viewer

No impact would occur where:

- the transmission line would be isolated, screened, not noticed in the view, or seen from a great distance.
- views would be of short duration.
- no visually sensitive resources would be affected.

4.8.2 Impacts Common to Construction Alternatives

Transmission line facilities would be seen from a variety of potential viewpoints along all of the proposed routes, including private residences, highways, and recreation areas. The construction, operation, and maintenance of the proposed transmission line and substation facilities would have short- and long-term effects on visual resources. Structures, conductors, insulators, spacers, aeronautical safety markings, vegetation clearing, access roads, ground preparation for structures, and pulling sites for the conductor would all create visual effects. A transmission line's visual presence would last from construction throughout the life of the line.

4.8.3 Preferred Alternative (Alternative 2)

The Preferred Alternative is made up of sagebrush and agricultural landscapes. View 1 (Photo 4.8-1) simulates crossing the Vantage Highway in Segment A. See Map 10, *Visual Analysis*, for location. The sagebrush terrain is characteristic of most of Segments A and B. In this location, the addition of a new line would be clearly visible and would briefly extend the motorist's visual experience of the transmission corridor, but it is expected that sensitive viewers will not find this objectionable because the additional line would not become the dominant feature of this relatively common view.

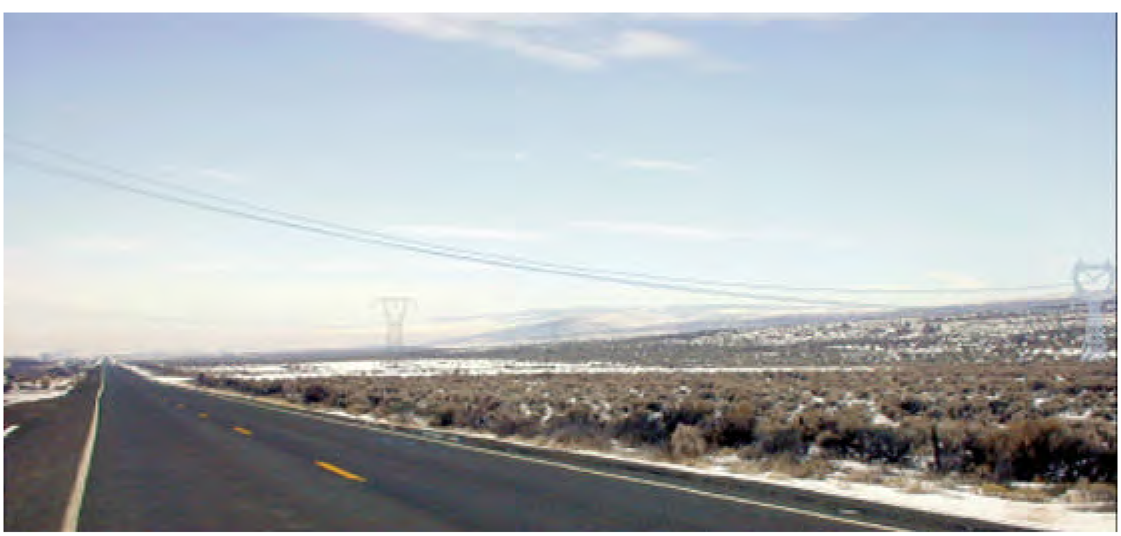

Photo 4.8-1. Visual simulation of Segment A crossing Vantage Highway (General View 1 — See Photo 3.9-5 for original photo)

The area near Colockum Pass (Segment A) is a Visually Sensitive Area due to the number of residences with foreground views of the transmission line project. (See photo below and location of Viewpoint A on Map 10, *Visual Analysis*.) In the Colockum Pass area, Segment A would pass close to a number of residences whose owners have expressed concerns about the visual impact of the project. Residential viewers would notice the additional structures and conductors during and after construction. However, the proposed structures would not dominate or become the focal feature because they would be located parallel to an existing transmission line that already impacts the views. Visual impacts to this Visually Sensitive Area would be moderate.

Photo 4.8-2. Visual simulation looking northeast and east along Gage Road towards Colockum Road (Visually Sensitive Viewpoint A — See Photo 3.9-1 for original photo)

Option 1 of the Sickler-Schultz Reroute would result in a moderate to high impact for one residence where the line would be in the foreground view. The impact on this residence would not change the overall impact for the Preferred Alternative. Option 2 was developed to lessen the impact to that one residence. The new line would still be within the foreground view at its closest location, but it would be screened and not be a dominate feature in the view. Option 2 would be a low to moderate impact to one residence.

View 2 (Photo 4.8-3) simulates crossing the Columbia River, south of the Wanapum Dam in Segment B. It illustrates how the addition of a new line would replicate the visual experience of the existing line and transmission ROW. It is expected that sensitive viewers will not find this objectionable, since the additional line would not become the dominant feature in this view.

Photo 4.8-3. Visual simulation of Segment B looking west across the Columbia River near the Vantage Substation (General View 2 — See Photo 3.9-7 for original photo)

The north face of the Saddle Mountains (Segment D) near the Columbia River and Lower Crab Creek is a Visually Sensitive Area due to its unique and striking landform, relationship to adjacent water bodies, and the number of viewers on Route 243. See Photo 4.8-4 below and location of Viewpoint B on Map 10, *Visual Analysis*.

In this area, the new transmission line would be clearly visible (primarily in the middleground) to most viewers including residents, tourists, and recreationalists traveling through the area. Three of the alternatives would scale the Saddle Mountains in this general area. The Preferred Alternative would be closest to most viewers. Viewers would notice the additional structures and conductors during and after construction, but the transmission line would not become the dominant feature in any view. There are existing transmission lines in the area, and the scale of the mountain would greatly minimize the perceived size of the proposed structures.

Visual impacts in this Visually Sensitive Area would be moderate.

Photo 4.8-4. Visual simulation looking east to Saddle Mountains from Highway 243 (Visually Sensitive Viewpoint B — See Photo 3.9-2 for original photo)

The crossing of the Columbia River west of the Vernita Bridge is considered a Visually Sensitive Area due to the number of motorists and potentially sensitive recreationalist viewers, as well as the presence of natural water bodies and dramatic landforms. However, these locations are 2 to 3 miles away from Segment D and seven existing transmission lines exist between the two locations. Segment D would occur on the furthest side of these existing seven lines. The grouping of lines occurs in the middleground of the view and is subordinated by the background of the Yakima Ridge. The new lines would be clearly to somewhat visible, depending on the time of day and weather conditions. The presence of the new lines would likely be difficult to discern from the existing lines. Impacts in these areas would be moderate to low.

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The addition of a smaller diameter fiber optic cable to these structures would be largely unnoticeable from existing conditions. Therefore, the visual impacts would be low to none.

Overall, the impact to visual resources would be low to moderate for the Preferred Alternative. Visual impacts for the majority of the alternative would be low excluding the two Visually Sensitive Locations where the impacts would be moderate.

Reminder

For most of the length of Segments A and B, visual resource impacts would be low. There is one Visually Sensitive Area where the impact would be moderate.

4.8.4 Alternative 1

Impacts to visual resources along Segment A and B would be the same as described for the Preferred Alternative.

In Segment E, the new transmission line would cross a combination of agricultural fields and sagebrush landscape. Where Segment E climbs the north face of the Saddle Mountains is a Visually Sensitive Area similar to the area seen in Viewpoint B, above. Alternative 1 would be slightly further from the road than the Preferred Alternative. Viewers would notice the additional structures and conductors during and after construction, but the transmission line would not become the dominant feature in any view. There are existing transmission lines in the area, and the scale of the mountain would greatly minimize the perceived size of the proposed structures. Visual impacts to this Visually Sensitive Area would be moderate.

Overall, the impact to visual resources would be low to moderate for Alternative 1. Visual impacts for the majority of the alternative would be low with one Visually Sensitive Area where the impacts would be moderate.

For most of the length of Segment A, visual resource impacts would be low. There is one Visually Sensitive Area where the impact would be moderate.

4.8.5 Alternative 3

Impacts to visual resources along Segment A would be the same as described for the Preferred Alternative.

There would primarily be two sets of viewers of Segment C. Army personnel on maneuvers would have a foreground view of the new transmission line; however, these viewers are not deemed to be sensitive to aesthetics while on maneuvers. The other set would be viewers from across the Columbia River. There is no existing line in the area that Segment C would be built; therefore, Segment C would change an existing landscape view. The new transmission line would be in the mid- to background for most of these viewers, and due to the varied terrain elevation, sitings of the towers and conductors would not be continuous. Impacts to Segment C would be low to moderate.

Overall, the impact to visual resources would be low to moderate for Alternative 3. Visual impacts for the majority of the alternative would be low with one Visually Sensitive Area where the impacts would be moderate.

4.8.6 Alternative 1A

Reminder

For most of the length of Segment A and B, visual resource impacts would be low. There is one Visually Sensitive Area where the impact would be moderate.

Impacts to visual resources along Segment A and B would be the same as described for the Preferred Alternative.

In Segment F, the new transmission line would cross the south face of the Saddle Mountains and sagebrush landscape. Where Segment F climbs the north face of the Saddle Mountains is a Visually Sensitive Area similar to the area seen in Viewpoint B (Photo 4.8-4). Alternative 1A would be farther east than the other alternatives and in an area that does not have existing transmission lines. View 3 simulates looking across Lower Crab Creek at Segment F ascending the north face of the Saddle Mountains (Photo 4.8-5). Although the new line would be clearly visible and impact a seemingly undisturbed portion of the mountain, the large scale of the landform dominates the view. Furthermore, it would also be in an area that would not have as many viewing opportunities. Visual impacts to this Visually Sensitive Area would be moderate.

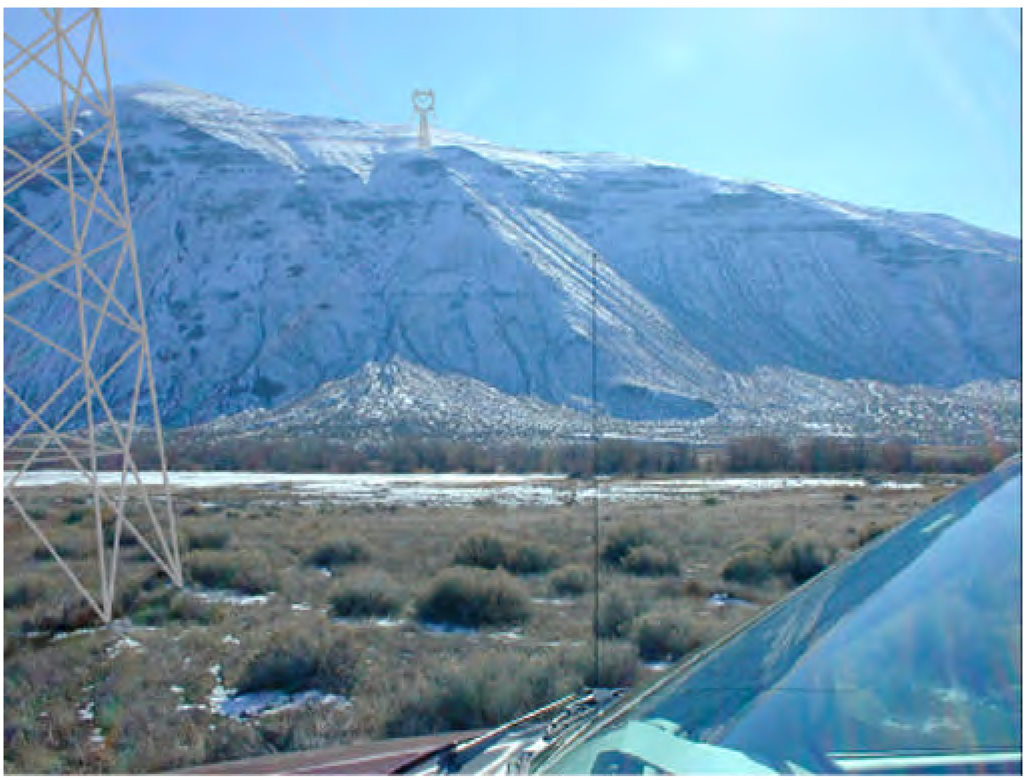

Photo 4.8-5. Visual simulation of Segment F ascending the north face of Saddle Mountains (General Viewpoint 3 — See Photo 3.9-17 for original photo)

Due to its striking landform and recreational value, the Saddle Mountain Ridgeline is considered a Visually Sensitive Area (Viewpoint C on Map 10, *Visual Analysis*). Locating the transmission line on top of the ridgeline would change the view of the landform and have a high visual impact. However, locating Alternative 1A near the base of the mountains would easily mitigate this sensitivity. A simulation of this placement is shown in Photo 4.8-6, below.

With proposed placement of line, visual impacts would be low.

Photo 4.8-6. Visual simulation looking northwest towards Saddle Mountains from Wahluke Slope (Visually Sensitive Viewpoint C — See Photo 3.9-3 for original photo)

View 4 (Photo 4.8-7) simulates Segment F, looking north toward the Saddle Mountains. (See Map 10, *Visual Analysis*, for location.) The structure in the middle of the photo is part of the existing line, the new line simulation is on the left. Although the addition of a new line would replicate the visual experience of the existing line and transmission corridor (which is clearly visible but not the dominant feature), this view will be seen by relatively few viewers.

Photo 4.8-7. Visual simulation looking north toward the Saddle Mountains, of Segment F, parallel to the Grand Coulee-Hanford transmission line (General View 4 — See Photo 3.9-19 for original photo)

Overall, the impact to visual resources would be low to moderate for Alternative 1A. Visual impacts for the majority of the alternative would be low with three Visually Sensitive Locations where the impacts would be moderate for Viewpoints A and B, and low for Viewpoint C.

4.8.7 No Action Alternative

Existing transmission lines would continue to be seen from a variety of views. Visual effects would continue as they currently exist.

4.8.8 Recommended Mitigation

Mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Potential mitigation measures include:

- using a non-specular conductor and insulator to reduce visual impacts that cannot be avoided in sensitive areas.
- locating facilities in relationship to landforms so that they will screen transmission line features.
- avoiding highly erodible soils, if possible.
- revegetating disturbed areas with native plant communities.

4.8.9 Cumulative Impacts

Generally, the construction of additional structures, lines, roads and substations would add physical features (and thus, visual effects) to the landscape. Cumulatively, although these effects are considered minor, they will alter and contribute to an ever-increasing manmade visual presence on the natural landscape of the study area.

4.9 Recreational Resources

Reminder

Recreation terms introduced in Chapter 3 include:

***Dispersed Recreation** includes activities that are not limited to a finite location. They do not require improvements that commit the resource to a particular type of recreation.*

***Dedicated Recreation** includes recreational activities that are limited to a finite geographic location and are supported by improvements that commit the resource to a specific recreational activity.*

4.9.1 Impact Levels

Impacts would be considered **high** where transmission facilities would:

- preclude existing or planned ***dispersed*** recreational uses after construction of transmission lines or access roads.
- alter or eliminate ***dedicated*** recreational activities after construction of transmission lines or access roads.

Impacts would be considered **moderate** where transmission facilities would:

- temporarily preclude or limit dispersed and dedicated recreation opportunities during peak use periods during construction of transmission line and/or access roads.

Impacts would be considered **low** where transmission facilities would:

- temporarily preclude or limit dispersed and dedicated recreation opportunities during off-peak use periods during construction of transmission line and/or access roads.
- require minor relocation of dispersed recreational activities to equal or better location after construction of transmission line and/or access roads.

No impact would occur to recreation areas if there was no effect upon the location or safety of recreational uses during and after construction.

4.9.2 Impacts Common to Construction Alternatives

All of the alternatives would have temporary impacts related to construction. For safety reasons, during construction, recreation would not be allowed within the construction area. This could result in a temporary closure of existing access roads and trails and, consequently, temporarily limit access to some recreation areas. During conductor and fiber optic stringing, activities such as sightseeing, watersports, and boating would be limited in the construction area.

*A **rock hounder** is a recreationalist in search of rocks, including petrified wood.*

Dispersed recreation such as hunting, off-road vehicle use, fishing, hiking, ***rock hounding***, horseback riding, camping, snowshoeing, snowmobiling, sightseeing, wildlife viewing, falconry, mountain biking, bird watching, hang gliding, paragliding, and field dog training and trials might experience low impacts during construction. Although peak season for these activities correlates with the typical construction season, potential impacts are considered low because these dispersed activities are not limited to a specific area and could undergo a minor relocation without much interruption.

The low intensity nature of most dispersed activities could allow them to continue even within proximity to construction. In particular, fishing, hiking, rock hounding, horseback riding, camping, snowshoeing, sightseeing, wildlife viewing, falconry, bird watching mountain biking and some watersports are all unmotorized activities that move at relatively slow speeds and can therefore quickly adjust for minor disturbances.

Following construction of the transmission lines, fiber optic lines and access roads, recreation activities may resume without impacts. Recreational use of areas that were temporarily closed during construction would resume as before construction. Also, with improved and/or additional access roads, changes in access to recreational opportunities may occur.

4.9.3 John Wayne Trail

All alternatives would cross the Iron Horse State Park portion of the John Wayne Trail at least once while crossing the YTC. The trail, which follows the old railroad grade, is in a series of cuts and fills in the area of Segments B_{NORTH}, B_{SOUTH} and C. Views are limited approximately 50 percent of the time by the cut walls on either side of the trail. From fill portions of the trail, two other transmission lines are easily seen. B_{NORTH} would cross the trail in two places, with the view being localized to the crossings. B_{SOUTH} would follow on the south side of the trail and an existing transmission line. The trail in the area of these segments would be temporarily closed during construction. The temporary impacts to the trail-related activities would be moderate if construction was conducted during the peak use periods, and they would be low if conducted during the off-peak use periods.

The Preferred Alternative and Alternatives 1 and 1A would cross the Milwaukee Road Corridor portion of the John Wayne Trail on the east side of the Columbia River outside Beverly, Washington. The three alternatives would cross the east/west running trail roughly perpendicularly, spanning the trail corridor. Construction would temporarily close the trail at the location of the transmission line crossings, causing temporary impacts to trail-related activities.

Impacts would be moderate if construction occurred during peak use periods and low if it occurred during off-peak use periods.

Photo 4.9-1. John Wayne Trail along Segment B_{SOUTH}

Once the transmission line is constructed, users of the trail will continue to use the trail as before. There would be short-term evidence of construction activities until disturbed areas are revegetated.

4.9.4 No Action Alternative

No impacts would be expected to recreation resources under this alternative.

4.9.5 Recommended Mitigation

- Coordinate with agencies to inform the public about construction closures.
- Inform the YTC Environment and Natural Resources Division, Operations Center, and the guards at the entry points of any planned construction-related closures to the trail so they may inform potential users.
- Provide directions to the nearest access point to the open portions of the John Wayne Trail on the YTC to the guards at the entry sign-in points so they may inform trail users.

- Discuss locations of new structures, conductor lines, and access roads with land managers and owners in order to avoid sensitive recreation areas.

- After consultation with land owners/agencies, install gates and fencing where needed to discourage unauthorized public use of access roads on private lands.

4.9.6 Cumulative Impacts

Generally, this region of Washington is rural in nature and is characterized by agricultural uses and striking natural landforms. However, it is experiencing increased development growth by people looking for the benefits of rural living and as a vacation destination. The construction of a new transmission line would add physical features to the landscape and contribute to the ever-increasing manmade presence on the natural landscape. All of these factors affect the type and experience of recreation activities.

Development provides access opportunities to areas previously inaccessible. New access roads could lead to increased recreational opportunities such as hunting, wildlife viewing, sightseeing, and off-road vehicle operating in areas unaccustomed to such activities.

Providing access to new areas reduces the areas available for recreationalists looking to experience nature.

Reminder

*The **Area of Potential Effect (APE)** for this project is defined as the entire ROW for the length of the proposed transmission line, access roads, and fiber optic route.*

4.10 Cultural Resources and Historic Properties

This section assesses the project's potential impacts on cultural resources and historic properties in the ***APE***. This assessment is based on information gathered from:

- literature searches and pedestrian surveys
- compilation and assessment of records, reports, and survey results of sites that would be potentially impacted.

A discussion of both generalized and site-specific impacts and mitigation is included in this section.

4.10.1 Impact Levels

Because cultural resources and historic properties are considered invaluable, any impact to them would be considered to be equally important. For this reason, potential impacts are discussed in general terms without the relative ratings of high, moderate, or low.

4.10.2 Impacts Common to Construction Alternatives

Any ground-disturbing activity within the boundaries of a cultural resource or significant historic property could be destructive, resulting in the permanent, irreversible, and irretrievable loss of scientific information and/or cultural value. Ground disturbance activities associated with construction include clearing vegetation, grading and backfilling, using heavy equipment, constructing structures, and constructing access roads.

Non-ground-disturbing activities, such as acquiring new right-of-way, cutting vegetation, reseeding, changing access and use, and ongoing operations and maintenance may or may not have negative impacts on cultural resources or historic properties depending on the type of resource or property involved and the proximity of the activity to the resource or property.

4.10.3 Preferred Alternative (Alternative 2)

Site-specific impacts to potentially significant historic properties would be avoided by locating structures and access roads outside of known historic property boundaries. New historic properties could be discovered during construction.

Pedestrian surveys were conducted only for the Preferred Alternative, including access roads, ROW, and the fiber route. If an alternative other than the Preferred Alternative is chosen, further surveys would need to be conducted to identify cultural resources and potentially significant historic properties as well as site-specific avoidance and mitigation strategies for historic properties.

4.10.4 No Action Alternative

The No Action Alternative includes no new or additional impacts.

4.10.5 Recommended Mitigation

BPA designed the Preferred Alternative so that all known historic properties would be avoided by project construction, operation, and maintenance activities. Site-specific mitigation is described below to ensure nearby known historic properties are protected during these activities. In addition, general measures for protecting any newly discovered historic properties during the course of construction, maintenance, and operation activities are listed below.

4.10.5.1 Site-Specific Avoidance Measures

Specific avoidance measures are recommended for significant or potentially significant historic properties that are near the Preferred Alternative. The following measures will be implemented at specific sites:

- use on-site construction monitors to coordinate with construction contractor, road engineers, and design engineers
- keep all construction equipment and vehicles on existing roads
- use flagging to restrict ground disturbance activities
- reroute the location of new or upgraded roads and towers to avoid known properties
- conduct subsurface probes if needed to determine presence or absence of cultural deposits
- place protective fabric or rock on roads and ROW as needed
- adjust direction of fiber optic line pulling
- perform subsurface investigations for three properties to determine the eligibility to meet NRHP criteria
- conduct additional surveys for any design adjustments made before construction
- staging area locations would be determined by the construction contractor before or during construction. The size of each location may vary. The construction contractor would negotiate with the landowner for the use of staging areas. A pedestrian

survey of the staging area would be done to assure absence of historic properties before staging sites are approved.

4.10.5.2 Discovery of New Cultural Resources

If previously unknown historic properties are discovered in the course of project activities, work in the immediate area would halt and the area would be secured. The SHPO, affected Native American tribes, and agency archaeologists would be notified immediately, and a professional archaeologist who meets the Secretary of Interior's Qualifications Standards would examine the site and make recommendations for mitigation.

As required for compliance with Sections 106 and 110 of the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the National Environmental Policy Act (NEPA) and Executive Order 13007, BPA would consult with the following groups concerning discovered historic properties, their management, and potential impacts that the proposed project could have on them:

- the Washington State Historic Preservation Officer (SHPO) through the Office of Archaeology and Historic Preservation (OAHP)
- affected Native American tribes
- the owning federal agency, if discoveries are made on federal lands.

4.10.6 Cumulative Impacts

This and other projects in the area are providing monetary resources for the discovery of important cultural resources and historic properties. The negative side of this is that as resources and properties are discovered and become part of public knowledge, the possibility of their destruction becomes greater. BPA, in cooperation with Native American tribes, other federal agencies administering public lands, and the Washington State Office of Archaeology and Historic Preservation, is limiting the distribution of specific information pertaining to cultural resources and historic properties. Results of the literature review and pedestrian survey are only summarized in the EIS for this purpose. Therefore, adverse cumulative impacts through the discovery, documentation, and public knowledge of new cultural resources and historic properties are minimized.

4.11 Public Health and Safety

Power lines, like electrical wiring, can cause serious electric shocks if certain precautions are not taken. These precautions include building the lines to minimize shock hazard. All BPA lines are designed and constructed in accordance with the National Electrical Safety Code (NESC). NESC specifies the minimum allowable distances between the lines and the ground or other objects. These requirements determine minimum distance to the edge of the ROW, the height of the line, and the closest point to the line that houses, other buildings, and vehicles are allowed to be located.

➡ For Your Information

This section discusses the potential causes of impacts that could affect public health and safety.

People must also take certain precautions when working or playing near power lines. It is extremely important that people do not place potential conductors, such as TV antennae, irrigation pipes, or streams of water from irrigation, too close to the lines. BPA provides the free booklet *Living and Working Safely Around High Voltage Power Lines*, which describes safety precautions for people who live or work near transmission lines.

4.11.1 Impact levels

Impact levels are dependent on public and occupational use of the land. The potential for public health and safety impacts increases in areas where human activities take place.

A **high** impact would occur if:

- the new line precludes the use of the ROW for pre-existing activities.
- noise levels for the new line exceed existing state standards.

A **moderate** impact would occur if:

- the new line alters pre-existing ROW activities.
- residents are present and nuisance noise levels occur, exceeding **ambient noise** levels during a portion of the time.

➡ Reminder

Ambient noise *is the noise level of the surrounding area.*

A **low** impact would occur if:

- the new line would not produce a change in ROW activities.
- there would be no perceived change in noise levels.

4.11.2 Electric and Magnetic Fields

To quantify ***EMF*** levels along the alternatives, the EMFs from the new and existing lines were calculated using the BPA Corona and Field Effects Program (USDOE, undated) for all alternatives. Minimum clearances were assumed to provide worst-case (highest) estimates for EMF levels. These worst-case conditions would seldom occur. (See Appendix I, *Electrical Effects*.)

The possible effects of EMF from transmission lines interacting with people on and near a ROW fall into two categories:

1. Short-term health and safety effects that can be perceived and may represent a nuisance: possible short-term effects are discussed below.

2. Possible long-term health and safety effects: The issue of whether there are long-term health effects associated with transmission line fields is controversial. In recent years, considerable research on possible biological effects of EMF has been conducted. Evidence that EMF exposures pose health risks is weak and there are no exposure standards based on long-term health effects. A review of recent studies and their implications for health-related effects is provided in a separate technical report, Appendix J, *Assessment of Research Regarding EMF and Health and Environmental Effects*.

4.11.2.1 Electric Fields – Short-Term Effects

Short-term effects from transmission line electric fields are associated with experiencing shocks from induced currents and voltages, and perceiving the electric field. Under certain conditions, induced current (spark-discharge) shocks can be experienced when a person contacts objects in an electric field. These effects occur in fields associated with transmission lines that have voltages of 230-kV or higher, and could occur under the new transmission line.

Primary shocks are those that can result in direct physiological harm. These shocks will not occur from induced currents under the existing or new lines, because clearances aboveground required by the NESC prevent large vehicles from these shocks, and grounding practices eliminate large stationary objects as sources of these shocks.

Secondary shocks are defined as those that could cause an involuntary and potentially harmful movement, but no direct physiological harm. Secondary shocks could occur under the proposed 500-kV line when making contact with ungrounded conducting objects such as vehicles or equipment. However, such occurrences are anticipated to be very infrequent. Shocks, when they occur under the 500-kV line, are most likely to be at a nuisance level.

Induced currents are always present in electric fields under transmission lines and will be present near the new line. However, during construction BPA routinely grounds metal objects located on or near the ROW. Grounding eliminates these objects as sources of induced current and voltage shocks. Induced currents are extremely unlikely to be perceived off the ROW of the new line.

Unlike fences or buildings, mobile objects such as vehicles and farm machinery cannot be grounded permanently. There are several ways to limit the possibility of induced currents from mobile objects to persons. First, required clearances for aboveground conductors tend to limit field strengths to levels that do not represent a hazard or nuisance. The NESC (IEEE, 1990) requires that sufficient conductor clearance be maintained in order to limit the induced short-circuit current in the largest anticipated vehicle under the line to 5 ***milliamperes*** (mA) or less. This can be accomplished by limiting access or increasing conductor clearances in areas where large vehicles could be present.

For Your Information

*A **milliampere** is one thousandth of an ampere, a measure of electric current.*

The BPA and other utilities design and operate lines in compliance with NESC standards. The NESC's 5-mA criterion would be met for perpendicular road crossings of the proposed line, and the conductor clearance at each road crossing would be checked during the design stage of the line to ensure that this criterion is met. In accordance with NESC standards, line clearances would also be increased in critical areas such as over railroads and water areas suitable for sail boating.

The potential impacts of electric fields could be mitigated through implementing grounding policies, adhering to NESC standards, and increasing clearances above the minimums specified by the NESC. Worst-case levels are used for safety analyses, but in practice induced currents and voltages are considerably reduced by unintentional grounding and by shielding provided by conducting objects, such as vehicles and vegetation.

Computer models were run to calculate electric fields for the different alternatives, the results of which can be found in Appendix I, *Electrical Effects*. The maximum calculated peak electric field expected for the new transmission line would be 8.9 kilovolts-per-meter (kV/m) or less, depending on the location along each alternative. These peak values are only directly under the line near mid-span, where the conductors are at the minimum clearance.

The largest values expected at the edge of the ROW nearest the new transmission line would be 2.0 kV/m. The largest fields at the edges of the existing ROWs are 5.2 and 2.0 kV/m for the 500- and 230-kV lines, respectively.

The existing 500-kV, 230-kV and 115-kV lines in the study area have peak electric fields of 9.7, 3.3, and 1.7 kV/m respectively. These would be the electric fields present if the No Action Alternative was chosen.

4.11.2.2 Magnetic Fields – Short-Term Effects

The magnetic field generated by currents on transmission line conductors extends from the conductors through the air and into the ground. The magnitude of the field at a height of 1 meter is frequently used to describe the magnetic field under transmission lines. The most important transmission line parameters that determine the magnetic field are conductor height above ground and magnitude of the currents flowing in the conductors. As distance from the transmission line conductors increase, the magnetic field decreases.

Computer models were run to calculate magnetic fields for the different alternatives, the results of which can be found in Appendix I, *Electrical Effects*. The field values on the ROW and at the edge of the ROW are given for projected maximum currents during summer peak load, for minimum and average conductor clearances. Field levels for the new line would be comparable with those for existing lines in the study area. The actual magnetic field levels would vary as currents on the lines change daily and seasonally and as ambient temperature changes. Average currents over a year would be considerably reduced from peak values. On the new ROW with no parallel lines and with the conductors at a height of 33 feet, the maximum magnetic field at 1 meter above ground is 244 milligauss (mG). For an average conductor height of 47 feet, the maximum field would be 137 mG. The maximum fields under the new line in the configurations with parallel lines would be less than these values.

At the edge of the new ROW, the calculated magnetic field for maximum current conditions would be 55 mG for conductor height of 33 feet and 46 mG for a conductor height of 47 feet. Fields at the edge of the ROW of the new line in configurations with parallel lines would be slightly more than those stated above. The field at the edge of the ROW adjacent to a parallel line would depend on that line.

The magnetic field falls off rapidly as distance from the line increases. The calculated magnetic field for maximum current would be less than 10 mG at about 185 feet from centerline of the new transmission line. At a distance of 200 feet from centerline, the field would be 8 mG for maximum current conditions.

The peak magnetic fields on the ROWs are 302 mG and 170 mG, for the 500-kV and 230-kV lines, respectively. Fields at the edges of the existing ROWs range from 158 mG for the Schultz-Vantage 500-kV line to 7 mG for the North Bonneville-Midway 230-kV line, which has a very wide ROW. These would be the magnetic fields present if the No Action Alternative was chosen.

4.11.2.3 Health and Safety Impacts

Impacts from electric and magnetic fields are based on how the new line would potentially change activities presently occurring on the land that would become ROW. Farming is the activity most commonly affected by EMFs because moving and operating irrigation systems must be done with care. The impacts shown in Table 4.11-1, *Health and Safety Impact Level*, are for each alternative by segment.

Table 4.11-1
Health and Safety Impact Level

	Seg A	Seg B	Seg C	Seg D	Seg E	Seg F	Overall Impact
Preferred (2)	Low/Mod	Low		Mod			Low/Mod
Alternative 1	Low/Mod	Low			Mod		Low/Mod
Alternative 3	Low/Mod		Low				Low
Alternative 1A	Low/Mod	Low				Low	Low

4.11.3 Noise

The Washington Administrative Code (WAC) provides noise limitations by class of property: residential, commercial, or industrial. Transmission lines are classified as industrial, and can cause the maximum permissible noise level of 60 decibels (dBA) to intrude into residential property. During nighttime hours (10 pm to 7 am), the maximum permissible limit for noise from industrial to residential areas is reduced to 50 dBA. The latter level applies to transmission lines that operate continuously. The WDOE accepts the 50 dBA level at the edge of the ROW for transmission lines, but has encouraged BPA to design lines with lower audible noise levels.

4.11.3.1 Construction Noise

Noise impacts would result from construction activities. However, this noise would be short term, occurring mostly during daylight hours. It would typically occur for a few days only at any one location, such as near a residence.

Reminder

Corona *is a discharge at the surface of a conductor.*

Corona-generated noise can be characterized as a hissing, crackling sound. A technical definition is included in Chapter 9, (Glossary and Acronyms.

4.11.3.2 Transmission Line Noise

Corona-generated audible noise is of concern primarily for contemporary lines operating at voltages of 345-kV and higher during foul (wet) weather conditions. Based on meteorological records near the proposed transmission line routes, these conditions are expected to occur less than 7 percent of the time during the year. For a few months after line construction, residual grease or oil on the conductors can cause water to bead up on the surface. This results in more corona sources and slightly higher levels of audible noise and electromagnetic interference if the line is energized. However, the new conductors "age" in a few months, and the level of corona activity decreases to the predicted equilibrium value. The proposed line has been designed with three subconductors per phase, to yield acceptable corona levels.

During foul weather, there would be an increase in the perceived noise above ambient levels for all alternatives, at the edges of new ROW. The foul weather audible noise at the edge of the ROW for the new line alone would be 50 dBA. Along the sections of the Preferred Alternative (Segment D) where new ROW parallels the existing 230-kV ROW, the increase in line-noise levels during foul weather would be perceived as doubling the noise level at the edge of the ROW adjacent to the existing lines.

During fair weather conditions, which occur about 93 percent of the time in the study area, audible noise levels would be about 20 dBA lower than foul weather conditions (if corona were present). These lower levels could be masked by ambient noise on and off the ROW and would probably not be detectable above ambient levels.

Off the ROW, the level of audible noise from the proposed line would be well below the 55-dBA levels that can produce interference with speech outdoors. It is also highly unlikely that indoor noise levels from the line would exceed the 35-dBA level, when sleep interference can occur. In addition, because corona is a foul weather phenomenon, people tend to be inside with windows closed, which decreases their perception of corona noise when it is present. Ambient noise levels can also be high during foul weather periods (due to rain hitting foliage or buildings) and can mask corona noise.

Audible noise from the new transmission line would be below EPA guideline levels, and would meet the BPA design criterion that complies with the Washington state noise regulations.

4.11.3.3 Substation Noise

Alternatives 1 or 1A, ending at the Hanford Substation, would pass through the existing Vantage Substation, but no expansions would be necessary within the substation grounds. The Preferred Alternative (Alternative 2) would bypass the existing Vantage and Midway Substations. As a result, the area surrounding these two substations would not experience an increase in noise.

Reminder

See Map 2, Alternatives, for location of routes and substations.

The proposed added equipment at Schultz Substation would not result in increased noise levels. The alternatives terminating at the Hanford Substation would not result in increased noise levels at the substation. The additional substation equipment required would be similar to the equipment already in use.

The Preferred Alternative would terminate at a new Wautoma Substation, which would be a new noise source in the area. As with all substations, noise levels from the new Wautoma Substation would depend on the equipment installed and the operating modes of that equipment. However, due to the rural location of the substation and the absence of any residences in the general area, noise impacts would be minimal.

Expansion of the Schultz and Hanford Substations and creation of a new Wautoma Substation would be designed so that the maximum noise level at the property line would not exceed the 65-dBA level required by the Washington State standard for Class C property (industrial zones that includes range and agricultural lands).

4.11.3.4 Noise Impacts

Noise impacts are based on the level of the noise produced by the new line and the people present to hear the noise. If a nuisance level of noise is produced, but people sensitive to the noise are not present, then there is a low impact. This is the impact rating given for agricultural areas where the people present are primarily working. The noise impact levels shown in Table 4.11-2, *Noise Impact Level*, are for each alternative by segment.

Table 4.11-2
Noise Impact Level

	Seg A	Seg B	Seg C	Seg D	Seg E	Seg F	Overall Impact
Preferred (2)	Low/Mod	Low		Low			Low
Alternative 1	Low/Mod	Low			Low		Low
Alternative 3	Low/Mod		Low				Low
Alternative 1A	Low/Mod	Low				Low	Low

4.11.3.5 Radio and TV Interference

Corona on transmission line conductors can also generate electromagnetic noise in the frequency bands used for radio and television signals. This noise can cause radio and television interference (RI and TVI). Interference with electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345-kV or higher. This is especially true of interference with television signals. The three-conductor bundle design of the proposed 500-kV line is intended to mitigate corona generation and thus keep radio and television interference at acceptable levels.

Spark gaps on distribution lines and on low-voltage wood-pole transmission lines are a more common source of RI/TVI than corona from high-voltage electrical systems. This gap-type interference is primarily a fair weather phenomenon caused by loose hardware and wires. The new transmission line would be constructed with modern hardware, which would eliminate these problems and minimize gap noise. Consequently, this source of EMI is not anticipated for the proposed line.

Reminder

EMI *(electromagnetic interference) is a high-frequency noise caused by corona that can cause radio and television interference.*

Radio reception in the AM broadcast band (535 to 1,605 kilohertz (kHz)) is most often affected by corona-generated electromagnetic interference ***(EMI)***. FM radio reception is rarely affected. Generally, RI can affect only residences very near transmission lines. Predicted RI levels indicate that fair weather RI will be within the acceptable levels for all proposed route configurations at distances greater than 100 feet from the outside conductor of the proposed line.

Corona-caused TVI occurs during foul weather and is generally of concern for transmission lines with voltages of 345-kV or above, and only for conventional receivers within about 600 feet of a line. As is the case for RI, gap sources on distribution and low-voltage transmission lines are the principal observed sources of TVI. The use of modern hardware and construction practices for the new transmission line would minimize these sources. Predicted TVI levels at 100 feet from the outside conductor of the new transmission line, which would be operating at 500-kV, are comparable with TVI levels from other existing BPA 500-kV lines, and lower than those from the existing Sickler-Schultz 500-kV line.

There is a potential for interference with television signals at locations very near the new transmission lines in fringe reception areas. However, interference with television reception can be corrected by several approaches: improving the receiving antenna system; installing a remote antenna; installing an antenna for TV stations less vulnerable to interference; connecting to an existing cable system; or installing a translator. It is anticipated that all instances of TVI caused by the new transmission line could be effectively mitigated.

If interference should occur, there are various methods for correcting it, and BPA has an active program to identify, investigate, and mitigate legitimate RI and TVI complaints. Therefore, the anticipated impacts of corona-generated interference on radio, television, or other reception would be minimal.

4.11.4 Toxic and Hazardous Materials

Several common construction materials (e.g., concrete, paint, etc.) and petroleum products (e.g., fuels, lubricants, and hydraulic fluids) would be used during construction. BPA would follow strict procedures for disposal of these or any hazardous materials. No impacts would occur.

Some of the new substation equipment required at the Schultz Substation may contain oil. The new equipment at the Hanford Substation may contain oil, however, the Spill Prevention Control and Countermeasure Plan currently in place would be modified to include this expansion.

The Preferred Alternative would terminate at the new Wautoma Substation. The new line termination equipment required would contain limited amounts of oil. This equipment includes such things as breakers, switches, capacitors, buswork, substation dead ends, and a control house. Since it is expected that there would be no transformers required at this new substation, a spill containment system is not likely to be installed.

Contaminated media (soil, surface water or groundwater) if unexpectedly encountered during construction of the project may present potential risk/liability to BPA. Potential risk and liability includes workers health and safety, management of contaminated materials and/or exacerbation of contaminated media (soil, surface water, or groundwater).

Should contaminated media be unexpectedly encountered during construction of the project, work will be stopped, and an environmental specialist will be called in to characterize the nature and extent of the contamination and to determine how the work may safely be completed. Work will proceed only after measures approved by the WDOE are put in place to prevent the spread of contaminated materials and protect the health and safety of workers.

4.11.5 Fire

Construction of the new transmission line could take place at any time of the year. However, it can be expected that some construction activities will occur during summer when the weather is hot and dry. During the summer months, the potential for wildfires is high due to dry vegetation, such as sagebrush and grasses, along the new ROW. The fire risk increases even more with the increased use of vehicles and other motorized equipment during construction. The addition of construction workers in the area also elevates the potential for fire. Vehicles would carry fire suppression equipment, including a shovel, fire extinguisher, and bladder or water supply Construction crews will supply additional suppression equipment if construction occurs on an agency's property that requires more caution, or if the chance of fire is high (e.g., dry wheat fields).

To prevent fires and other hazards, BPA maintains a safe clearance between the tops of trees and power lines. Because electricity can arc from a conductor to a treetop, trees are generally not allowed to grow over 20 feet high on the ROW. Trees that need to be cleared from the ROW, and any that could fall into the line (danger trees) are marked and removed.

4.12 Air Quality

4.12.1 Impact Levels

Impacts would be **moderate** if one or more of the following would occur:

- An effect would be created that could only be partially mitigated.
- Air quality would be reduced locally.
- A possible (but unlikely) risk to human health or safety would occur due to air quality.

Impacts would be **low** if one or more of the following would occur:

- An effect would be created that could be largely mitigated.
- A reduction in air quality near the construction or clearing site would occur.
- The project would cause insignificant or very unlikely health and safety risks due to air quality.

4.12.2 Impacts Common to Construction Alternatives

Construction vehicles and windblown dust from the construction sites and clearing activities would create short-term low impacts on air quality.

Construction vehicles and heavy equipment would emit pollutants such as carbon monoxide (CO), sulfur oxides, particulate matter, nitrogen oxides, volatile and semi-volatile organic compounds, and carbon dioxide (CO_2). Emissions would be short-term and would have low or no impact on air quality.

The only potential for long-term impacts to air quality would come from the new line itself, which would cause limited air emissions. The high electric field strength of a 500-kV transmission line can cause a breakdown of air at the surface of the conductors, which is called ***corona***. The proposed 500-kV line is designed to have lower corona levels than are present on the older 500-kV lines in the area and would not result in impacts to air quality.

4.12.3 No Action Alternative

No impacts are expected from this alternative.

For Your Information

Corona *is an electrical discharge at the surface of a conductor transmission line. A technical definition is included in Chapter 10, Glossary and Acronyms.*

When corona is present, the air surrounding a conductor is ionized and many chemical reactions take place that produce small amounts of ozone and other oxidants. Ozone comprises approximately 90 percent of these oxidants, and the remaining 10 percent is mainly composed of nitrogen oxides. The national primary ambient air quality standard for photochemical oxidants, of which ozone is the principal component, is 235 micrograms per cubic meter, or 120 parts per billion. The maximum incremental ozone levels at ground level produced by corona activity on the proposed transmission lines during foul weather would be much less than one part per billion. This level is insignificant when compared with natural levels and fluctuations in natural levels.

4.12.4 Recommended Mitigation

- In order to minimize windblown dust, water trucks would be used to spray roadways and construction sites when necessary.
- Dust Control procedures would be included in the construction Storm Water Pollution Prevention (SWPP) specifications and the SWPP plan.
- Lop and scatter would be used to recycle vegetation.
- To prevent erosion, disturbed areas would be reseeded with grass or an appropriate seed mixture.

4.12.5 Cumulative Impacts

Over the long term, the proposed project would cause no cumulative effects on local or global air quality.

4.13 Short-Term Use of the Environment and the Maintenance and Enhancement of Long-Term Productivity

The alternatives under consideration do not pose impacts that would significantly alter the long-term productivity of the affected environment. A good example of this is the existing lines in the study area. They were built in the 1940's through the 1960's. The affected environment has recovered since then and, while there is never complete recovery, the long-term productivity of the affected environment has not been significantly altered. Likewise, if the proposed project was built and then removed and the affected areas restored, little change in long-term environmental productivity would occur.

4.14 Irreversible and Irretrievable Commitment of Resources

The proposed project would include the use of aluminum, steel, wood, gravel, sand, and other non-renewable materials to construct steel structures, conductors, insulators, access roads, and other facilities. Materials may come either from on-site borrow pits or from outside sources. Petroleum-based fuels would be required for vehicles and equipment.

The proposed project would cause commitments that result in the loss of wildlife habitat for certain species and the loss of production or renewable resources, such as circle-irrigated cropland. The proposed project would irreversibly convert wildlife habitat and shrub-steppe habitat to utility and associated maintenance uses.

The proposed project would result in a loss of cropland and rangeland. These commitments are irretrievable rather than irreversible, because management direction could change and allow these uses in the future.

4.15 Adverse Effects that Cannot be Avoided

Implementation of the proposed project would result in some adverse impacts that cannot be fully avoided. These impacts and proposed mitigation are discussed under the specific resource section earlier in this chapter. Many adverse effects would be temporary, occurring during site-specific activities.

Some of the adverse effects that cannot be avoided in the proposed project include the following:

- The elimination small areas of vegetation, including wetlands and riparian vegetation, due to permanent physical developments such as transmission line structures and maintenance roads.
- Intermittent and localized decreases in air quality from dust caused by the construction, maintenance, and use of roads.
- Short-term soil compaction, erosion, vegetation degradation, and stream sedimentation from construction and maintenance.
- Short-term disturbance to wildlife during construction.
- Short-term disruption of agricultural activities during construction.
- An increased level of habitat fragmentation and reduction in the amount of shrub-steppe vegetation available for wildlife habitat.

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Chapter 5 — Consultation, Permit, and Review Requirements

In this Chapter:

- **Laws and procedures to follow**
- **Consultations**
- **Permits**

Several federal laws and administrative procedures must be met by the alternatives. This chapter lists and briefly describes requirements that would apply to elements of this project, actions taken to ensure compliance with these requirements, and the status of consultations or permit applications. This EIS was sent to tribes, federal agencies, and state and local governments as part of the consultation process for this project.

5.1 National Environmental Policy Act

This Final EIS was prepared according to the National Environmental Policy Act (NEPA) (42 USC 4321 et seq.). NEPA is a national law that establishes an environmental policy. This policy requires that an interdisciplinary framework be used in environmental planning, ensures that federal agencies study the environmental effects of their actions, and provides full public disclosure and open decision-making on the part of federal agencies (Bass, Herson and Bogdan, 2001). NEPA applies to all federal projects or projects that require discretionary federal involvement. BPA considers potential environmental consequences and which actions it may take to avoid, minimize, or compensate for potential harm from its proposed action to the environment. BPA would also provide the public opportunities to review and input into the decision-making process.

5.2 Endangered and Threatened Species

The Endangered Species Act (ESA) of 1973 (16 USC 1536) provides for conserving endangered and threatened species of fish, wildlife, and plants. Federal agencies must determine whether proposed actions would adversely affect any federally listed endangered or threatened species. When conducting an environmental impact analysis for specific projects, agencies must identify practicable alternatives to conserve or enhance such species.

BPA received letters from the USFWS, dated March 14, 2001, and June 18, 2002, that listed the endangered and threatened species that could be potentially affected by the project. Information from the National Marine Fisheries Service (NMFS) on listed endangered and threatened species was obtained through current lists published on the agency's website. ESA regulations require that a Biological Assessment be prepared to identify any threatened or endangered species that are likely to be impacted by major construction activities. A Biological Assessment has been prepared separately, which presents effects determinations for each of these species. BPA submitted the Biological Assessment to the USFWS and NMFS for their review and concurrence with the effects determinations for each species. The effects determinations are presented in Table 4.4-1, *Threatened and Endangered Wildlife Species Effect Determinations*, and Table 4.4-2, *Proposed Listed Wildlife Species Effect Determinations*. BPA received USFWS concurrence on November 4, 2002. There were no effects to fish species listed by NMFS so they did not review the BA.

Possible impacts of the alternatives to federal threatened or endangered species are discussed in this section and in Chapter 4, *Environmental Consequences*, (Sections 4.3, *Vegetation*; 4.4, *Wildlife*; and 4.5, *Fish Resources*). Detailed discussions of federal proposed threatened and endangered species, candidate species, and species of concern are included in *Appendix F, Rare Plant Survey for the Preferred Alternative* and *Appendix G, Fish and Wildlife Technical Report.*

5.2.1 Fish

The NMFS lists chinook salmon (Upper Columbia River Spring Run) as endangered, Upper Columbia River steelhead trout as endangered, and Middle Columbia River steelhead as threatened. USFWS lists Bull trout as threatened.

Construction impacts would be generally short-term disturbances related to construction such as sediment input, mechanical disturbance, and material spills. However, since most of the project construction will occur away from streams and include mitigation (such as construction timing restrictions for in-water work and near sensitive spawning areas, and spill prevention and erosion measures), short-term construction-related disturbances should result in low or no impacts to all fish species.

Long-term impacts resulting from ongoing operation and maintenance would result mostly from habitat alteration due to clearing of riparian vegetation, changes in runoff and infiltration patterns (from upland vegetation clearing), sedimentation from cleared areas, and maintenance access streams. With similar mitigation employed during construction, maintenance activities should result in low or no impacts to all fish species.

5.2.2 Wildlife

Bald eagles are listed by the USFWS as threatened and are known to nest within the study area. Winter roosting areas are located along Wilson and Naneum Creeks. Construction near known bald eagle roost sites might disturb wintering bald eagles. However, in areas away from roost sites, the disturbance of bald eagles from construction will result in a minimal impact. With mitigation restricting construction activities in the Wilson/Naneum Creek areas during the winter use period, the proposed project would have no adverse impact on bald eagles. Other listed wildlife species that were identified as potentially occurring in or near the project area include the grizzly bear, gray wolf, Canada lynx, northern spotted owl and the marbled murrelet. However no suitable habitat or occurrences of these species were identified along the proposed project, therefore the project would have no impact on these species.

5.2.3 Plants

Ute ladies'-tresses is listed as a threatened species by the USFWS. There are several occurrences of this species in Washington state, but this species is not known to occur in any of the four counties within the study area. Potential habitat for this species may occur along Segments A, D, E, and F. Field surveys were conducted on the Preferred Alternative in August 2001 and 2002, to determine the presence of the species or its habitat. No populations were found. No impact to Ute ladies'-tresses would result from the project. Other listed plant species that were identified as potentially occurring in or near the project area include the Wenatchee Mountains checkermallow. However, this plant is not known to occur within 20 miles of the project area and there is no suitable habitat, therefore the project would have no effect on this species.

5.3 Fish and Wildlife Conservation

5.3.1 Fish and Wildlife Conservation Act

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. In addition, the Fish and Wildlife Coordination Act of 1934 (16 USC 661 et seq.) requires federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources.

Mitigation designed to conserve wildlife and their habitat is provided in Chapter 4 (See Sections 4.4.10, *Recommended Mitigation*, and 4.5.10, *Recommended Mitigation*). Standard erosion control measures would be used during construction to control sediment movement into streams, protecting water quality and fish habitat.

5.3.2 Essential Fish Habitat

Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for "Essential Fish Habitat" (EFH) descriptions in federal fishery management plans and to require federal agencies to consult with NMFS on activities that may adversely affect EFH. The Magnuson-Stevens Act requires all fishery management councils to amend their fishery management plans to describe and identify EFH for each managed fishery. The Pacific Fishery Management Council has issued such an amendment in the form of Amendment 14 (1999) to the Pacific Coast Salmon Plan. This amendment covers EFH for all fisheries under NMFS' jurisdiction that would potentially be affected by the proposed project. Specifically, these are the chinook and coho salmon fisheries. EFH in the project area includes all streams, lakes, ponds, wetlands, and other current viable water bodies and most of the habitat historically accessible to salmon. Activities occurring above impassable barriers that are likely to adversely affect EFH below impassable barriers are subject to the consultation provisions of the Magnuson-Stevens Act.

Under the Magnuson-Stevens Act, NMFS must be consulted by any federal agency undertaking, permitting, or funding activities that may adversely affect EFH, regardless of its location. Under Section 305(b)(4) of the act, NMFS is required to provide EFH conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Wherever possible, NMFS uses existing interagency coordination processes to fulfill EFH consultations with federal agencies. For the proposed project, this goal would be met by incorporating EFH consultation into the Endangered Species Act Section 7 consultation process.

5.3.3 Migratory Bird Act

The Migratory Bird Treaty Act (16 USC 703-712, July 3, 1918, as amended) implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and the former Soviet Union, for the protection of migratory birds. Under the act, "taking," killing, or possessing migratory birds or their eggs or nests is unlawful. Most species of birds are classified as migratory under the act, except for upland birds such as pheasant, chukar, and gray partridge.

The act allows few exemptions, such as waterfowl hunting. Many types of development result in the taking of migratory birds: collision with windows, for example, is a leading cause of death among songbirds. Taking may be allowed under a scientific permit if research is deemed beneficial to migratory birds.

Construction, operation, and maintenance of the proposed project would result in some impacts to migratory birds. Some of the potentially impacted bird species are protected under the Migratory Bird Treaty Act. Mortality of birds listed under the Migratory Bird Treaty Act could be viewed as a violation of this federal act, although there are presently no permits available to federal agencies for "incidental take", such as would result from the proposed transmission line project. Potential impacts to migratory birds include loss of habitat for species that nest in second growth coniferous, deciduous, or mixed forest types and that use edge habitat. Impacts would be limited to individuals potentially nesting in the area and would be incidental to the action. Given the large amount of habitat available for these species outside of the proposed clearing, the reduction in nesting habitat for these species is expected to be minor. BPA would ensure appropriate mitigation measures are employed to reduce the risk of mortality to a minimum.

5.3.4 Bald Eagle and Golden Eagle Protection Act

The Bald Eagle Protection Act (16 USC 668-668d, June 8, 1940, as amended 1959, 1962, 1972, and 1978) prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions. Because a small number of bald eagles may reside within foraging distance of the proposed project, there is a remote possibility some mortality could result to bald eagles. However, because the Act only covers intentional acts, or acts in "wanton disregard" of the safety of golden or bald eagles, this project is not viewed as subject to its compliance. See Chapters 3 and 4 of this EIS for further discussion. Potential impacts to bald eagles are addressed in the Biological Assessment prepared for this project as required under the ESA.

5.4 Heritage Conservation

Congress has passed many federal laws to protect the nation's historic properties. These include the National Historic Preservation Act, the Archaeological Resources Protection Act, the American Indian Religious Freedom Act, the National Landmarks Program, and the World Heritage List. Preserving historic properties allows many Americans to have an understanding and appreciation of their origins and history. An historic property is an object, structure, building, site, or district that provides irreplaceable evidence of natural or human history of national, state, or local significance. Historic properties include ***traditional cultural property (TCP)***, National Landmarks,

Reminder

*A **traditional cultural property (TCP)** is defined generally as one that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs (e.g., traditions, beliefs, practices, lifeways, arts, crafts, and social institutions) of a living community that are rooted in that community's history, and are important in maintaining the continuing cultural identity of the community.*

archaeological sites, and properties listed or eligible for listing on the National Register of Historic Places (NRHP).

Construction, operation, and maintenance of the alternatives could potentially affect historic properties. A literature review of the study area was done to determine the prehistory and history of the area and identify currently recorded sites. Pedestrian surveys of the ROW, access roads, and fiber route were also completed. This information and results of the survey are included in Chapters 3 and 4. A traditional cultural properties (TCPs) study is being prepared to augment the literature review and pedestrian surveys.

Pedestrian surveys will continue in January and/or February 2003 to evaluate and move any access roads and towers that may potentially affect known historic properties.

BPA shall continue Section 106 consultation with the Washington Office of Archaeology and Historic Preservation and affected Tribes to determine the effect of any potential impacts to listed and potentially eligible historic properties. BPA sent the ROW survey report (prepared and reviewed by a consultant under contract to the Yakama Nation) to affected Tribes (Yakama Nation, Confederated Tribes of the Colville Indian Reservation [CCT]) for information or review and to the Washington State Historic Preservation Office (SHPO) for concurrence in November 2002. The SHPO concurred with BPA's findings of no adverse effect. BPA will also send the access road and fiber survey report to the affected Tribes for information or review and to the SHPO for concurrence after surveys are complete and the report is finalized, prior to the initiation of any construction in culturally sensitive areas. BPA will request SHPO's concurrence on the findings, and if necessary, will undergo a Programmatic Memorandum of Agreement.

BPA is working with the CCT and the Yakama Nation to protect historic properties. Coordination will continue with the Tribes through construction.

If, during construction, previously unidentified historic properties are located, work will be halted in the immediate vicinity and BPA will follow all required procedures set forth in the following regulations, laws, and guidelines: Section 106 (36 CFR Part 800) of the National Historic Preservation Act of 1969, as amended (16 USC 470); the National Environmental Policy Act of 1969 (42 USC 4321-4327); the American Indian Religious Freedom Act of 1978 (PL 95-341); the Archaeological Resources Protection Act of 1979 (16 USC 470a-470m); and the Native American Graves Protection and Repatriation Act of 1990 (PL 101-601). A Memorandum of Agreement will be prepared if there is an adverse effect on a historic property that is eligible for listing on the NRHP.

5.4.1 Tribal Consultation

Under its responsibilities to Section 106 of the National Historic Preservation Act, BPA determined that the proposed action is a federal undertaking that has the potential to cause effects on historic properties. Pursuant to 36 CRF 800.4(a)(4), BPA initiated formal consultation with the Yakama Indian Nation and the CCT.

5.4.1.1 Yakama Indian Nation

BPA initiated formal government-to-government consultation with the Yakama Indian Nation in a letter dated March 30, 2001 to Mr. Lonnie Selam, Chairman, Tribal Council. This letter was signed by Stephen J. Wright, BPA's Acting Administrator and CEO. No response was received although meetings were held to discuss project details.

On June 14, 2001, BPA sent a letter to Mr. Johnson Meninick, Cultural Resources Program Manager, Yakama Indian Nation, initiating a consultation process. BPA did not receive a response although meetings were held to discuss project details.

On April 8, 2002, BPA sent a letter to Mr. Johnson Meninick, Cultural Resources Program Manager, Yakama Nation, initiating formal consultation. BPA did not receive a response.

On February 14, 2002, BPA signed a contract with the Yakama Indian Nation to conduct the first phase of a cultural resource survey for the project. While not directly under contract to BPA for the second phase of the survey, the Yakama Nation participated on the survey team and reviewed the second phase survey report.

5.4.1.2 Confederated Tribes of the Colville Indian Reservation

On April 8, 2002, BPA sent a letter to Ms. Adeline Fredin, Historic Preservation Director, CCT, initiating formal consultation. Ms. Fredin responded on May 22, 2002, requesting a consultation meeting be scheduled to discuss project details and issues. A consultation meeting occurred on July 2, 2002. The Schultz Hanford Area Transmission Line Project and other transmission line projects of concern to the CCT were discussed.

The CCT, under contract to Parsons Brinckerhoff (BPA's contractor), provided the Cultural Resource Assessment study for the Draft EIS.

The CCT is presently under contract to BPA to conduct a Traditional Cultural Properties Study, including oral history.

5.5 Federal, State, Area-Wide, and Local Plan and Program Consistency

5.5.1 Federal

5.5.1.1 U.S. Bureau of Land Management (BLM)

For Your Information

BLM land is crossed by all segments, see Map 7, Land Ownership.

Portions of all alternatives cross BLM-administered lands that are managed by the Spokane District. The BLM Spokane District is divided into 10 management areas, of which two are crossed by the alternatives. Table 5.5-1, *BLM-Administered Lands Crossed by Project Segments*, indicates which management areas are crossed by each alternative, and more specifically, each segment.

Table 5.5-1
BLM-Administered Lands Crossed by Project Segments

Segment	BLM Spokane District Management Area	Linear Distance Crossed on BLM-administered Land (miles)
A	Scattered Tracts	0.88
B_{NORTH}	Saddle Mountains	0.64
B_{SOUTH}	Saddle Mountains	0.64
C	Scattered Tracts	0.22
D	Saddle Mountains and Scattered Tracts	2.86
E	Saddle Mountains	4.88
F	Saddle Mountains	12.84

Note: BLM-administered lands crossed by B_{NORTH} and B_{SOUTH} are currently within the YTC boundaries and are managed under the YTC Cultural and Natural Resources Management Plan.
Table has been updated for the FEIS.

Several BLM planning documents identify goals, objectives, and standard design features and operations procedures for activities proposed to occur on BLM-administered lands crossed by the alternatives. These plans include the Spokane Resource Management Plan Record of Decision (1987), the Proposed Spokane Resource Management Plan Amendment Final Environmental Impact Statement (1992), and the Recreation Management/Implementation Plan for the Saddle Mountain Management Area (1997). Table 5.5-2, *Spokane District General Management Objectives*, lists the general management objectives stated in the Resource Management Plan as amended (***RMP***). This table also includes the actions BPA would take to be consistent with the management objectives of the RMP.

Table 5.5-2
Spokane District General Management Objectives

General Management Objectives	Consistency
1. Protect or enhance water quality with particular attention to those watersheds with major downstream water uses including anadromous and other sport fisheries and agriculture.	▪ BPA would protect water quality by locating crossing structures as far back from river stream banks as possible and avoiding riparian areas, drainage ways, canals, and other water bodies to the extent possible. ▪ Other measures to minimize impacts to water quality and sedimentation of water bodies are identified in Section 4.1, *Water Resources, Soils, and Geology*.
2. Maintain and/or improve range productivity by providing available forage to maintain existing or target wildlife populations as estimated by the Washington Department of Fish and Wildlife. The remaining forage would be provided for livestock.	▪ BPA would minimize the amount of vegetation disturbed by construction activities to maintain range productivity. ▪ BPA would prepare a checklist for the management of the ROW vegetation. ▪ Other measures to minimize impacts to vegetation are described in Section 4.3.8, *Recommended Mitigation*.
3. Adjust the level of sustained yield timber production by restricting production on specific forestlands, where appropriate, to accommodate other resource values. Forestlands would be withdrawn from production only when stipulations and/or mitigation would not adequately protect the other resources.	▪ No forestlands would be affected by the construction or operation and maintenance of the transmission line.
4. Keep public lands open for exploration/ development of mineral resources, rights-of-way, access, and other public purposes with consideration to mitigate designated resource concerns.	▪ Establishing a right-of-way for a new transmission line is a use for which the public lands are kept open. ▪ Mitigation for various resource concerns is discussed in Chapter 4, *Environmental Consequences*.
5. Enhance BLM land pattern and resource management efficiency through land tenure adjustments. Identify opportunities for jurisdictional transfers and develop leases or cooperative management agreements with other agencies or private individuals to improve management efficiency.	▪ No land tenure adjustments would result from the construction or operation and maintenance of the transmission line.
6. Manage upland habitat for nongame and game species to meet WDFW population targets.	▪ BPA would minimize the amount of vegetation disturbed by construction activities to maintain upland habitat for nongame and game species. ▪ BPA would prepare a checklist for the management of the ROW vegetation. ▪ Other measures to minimize impacts to vegetation are described in Section 4.3.8, *Recommended Mitigation*.
7. Manage public lands and keep access routes open for a variety of recreational opportunities/experiences, including both motorized and nonmotorized recreation activities.	▪ No access routes on public land would be closed to the public as a result of the construction and operation and maintenance of a new transmission line, unless the landowner requests that access be limited or closed.

General Management Objectives	Consistency
8. Consider the protection and/or enhancement of state listed threatened or endangered species habitat.	▪ BPA would consider impacts to state listed threatened and endangered wildlife, fish and plant species (See Sections 4.3, *Vegetation*, 4.4, *Wildlife,* and 4.5, *Fish Resources*). ▪ Mitigation for big game disturbance, avian collision, raptor disturbance, shrub-steppe habitat loss, and wildlife disturbance is detailed in Section 4.4.10, *Recommended Mitigation*. ▪ Mitigation for impacts to fish resources is detailed in Section 4.5.10, *Recommended Mitigation.* ▪ Mitigation for impacts to plants is detailed in Section 4.3.8, *Recommended Mitigation*.

Source: Spokane Resource Management Plan Record of Decision, 1987; Proposed Spokane Resource Management Plan Amendment Final Environmental Impact Statement, 1992. Table has been updated for the FEIS.

The RMP also provides objectives for the management of specific resources. Resources that may be affected by the construction and operation and maintenance of a new transmission line are listed in Table 5.5-3, *Spokane District Objectives for the Management of Specific Resources*, with associated management objectives. The actions that BPA would take to be consistent with these specific management objectives are also included.

Table 5.5-3
Spokane District Objectives for the Management of Specific Resources

Management Objectives for Specific Resources	Consistency
Recreation Management ▪ Recreational activities and visual resources will be evaluated as part of the specific activity plans and will be evaluated to determine their appropriateness in relation to the land use allocations made in the RMP. BLM management of cultural and historic resources emphasizes protection and preservation. ▪ The evaluation of visual resources will consider the significance of proposed projects and the visual/scenic sensitivity of the affected area. ▪ Special management areas, or Areas of Critical Environmental Concern (ACECs), have management plans that protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards. ▪ Off-Road Vehicle (ORVs) designations preclude access to public lands seasonally or year-long to all or specified types of vehicle use.	▪ BPA would evaluate impacts to recreational activities. (Section 4.9, *Recreational Resources.*) ▪ Impacts to recreation activities would occur during construction and be of short duration. ▪ Construction, operation and maintenance of a new transmission line would not affect the general layout and themes of recreation sites since most recreation is dispersed and would undergo temporary, minor relocation during construction. ▪ Cultural and historic resources would be protected and preserved to the extent possible. Mitigation for these resources is detailed in Section 4.10.5, *Recommended Mitigation*. ▪ No designated visual resource management areas would be affected by the construction or operation and maintenance of a new transmission line. BPA would take into account the impact of the project on visual resources, and would mitigate to minimize impacts (See Section 4.8.9, *Recommended Mitigation*). ▪ No ACEC's will be crossed by the proposed project. Sentinel Slope ACEC is the nearest one, located over three miles west of the proposed transmission line. ▪ Alternative 1A crosses BLM-administered lands that have ORV designations. In this area, vehicles are permanently restricted to designated roads and trails. BPA would utilize designated roads to the extent possible. If other access was temporarily required for construction, approval from BLM would be obtained.
Wildlife and Fish Habitat Management ▪ Project case-by-case evaluations will be made to consider the significance of the proposed projects and the sensitivity of fish and wildlife habitats in the affected areas. ▪ Management actions within riparian habitat areas, wetlands, and floodplains will include measures to preserve, protect, and restore natural functions. ▪ Seasonal restrictions will be applied to mitigate the impacts of human activities on important seasonal wildlife habitat. ▪ Sufficient forage and cover will be provided for terrestrial wildlife on seasonal habitat to maintain existing	▪ BPA would consider the impacts to fish and wildlife species and habitat. (See Sections 4.4, *Wildlife,* and 4.5, *Fish Resources*). ▪ Mitigation for big game disturbance, avian collision, raptor disturbance, shrub-steppe habitat loss, and wildlife disturbance is detailed in Section 4.4.10, *Recommended Mitigation*. ▪ Mitigation for impacts to fish resources is detailed in Section 4.5.10, *Recommended Mitigation*. ▪ BPA would avoid impacts to riparian habitat areas, wetlands, and floodplains to the extent possible by locating structures and access roads outside resource boundaries. If impacts cannot be avoided, mitigation measures to minimize impacts are detailed in Section 4.2.8,

Management Objectives for Specific Resources	Consistency
population levels or target population levels as established by WDFW.	*Recommended Mitigation*. ▪ BPA would maintain sufficient forage and cover by minimizing disturbance to vegetation. Specific mitigation is described in Section 4.3.8, *Recommended Mitigation*.
Endangered, Threatened, or BLM Sensitive Species Habitat ▪ Prior to any vegetation or ground disturbing manipulation projects, the BLM requires a survey of the project site for plants and animals listed or proposed for listing as threatened or endangered, or their critical habitats. ▪ For BLM sensitive species, or proposed or candidate T&E species, it is BLM policy to ensure that the crucial/essential habitats be considered in all management decision to minimize the need for future listing by either federal or state governments.	▪ BPA would conduct surveys of the Preferred Alternative that falls within BLM managed lands for plants and animals listed or proposed for listing as threatened or endangered, or their critical habitats. ▪ BPA would consider the impacts of the Preferred Alternative on sensitive proposed, or candidate T&E species. Mitigation detailed in Sections 4.4.10, 4.5.10, and 4.3.8, *Recommended Mitigation,* would minimize the need for future listings by either the federal or state governments. ▪ BPA would comply with the Endangered Species Act and would conduct the appropriate level of consultation with the US Fish and Wildlife Service and National Marine Fisheries Service.
Range Program/Grazing Management ▪ Continue present management of public land to benefit livestock and wildlife.	▪ BPA would minimize disturbance to vegetation in order to support the present management practices on public land that benefit livestock and wildlife. ▪ Specific mitigation is detailed in Section 4.3.8, *Recommended Mitigation*.
Ongoing Management Programs ▪ Noxious weed control will be proposed and subjected to site-specific environmental analyses. ▪ All public land will be available and open for utility and transportation corridor development except the Hot Lakes Resource Natural Area (RNA)/ACEC, the Brewster Bald Eagle Roost and Juniper Forest ACECs, the Chopaka Mountain Wilderness Study Area (WSA), and the Juniper Dunes Wilderness Area. New facilities will be encouraged to be located within existing corridors to the extent possible.	▪ BPA would incorporate measures to minimize the spread of noxious weeds. Mitigation to be employed is described in Section 4.3.8.4, *Minimize the Introduction and Spread of Weeds*. ▪ The new transmission line would not cross the Hot Lakes RNA/ACEC, the Brewster Bald Eagle Roost and Juniper Forest ACECs, the Chopaka Mountain WSA, or the Juniper Dunes Wilderness Area. ▪ The new transmission line would be located within or adjacent to existing corridors to the extent possible.

Source: Spokane Resource Management Plan Record of Decision, 1987; Proposed Spokane Resource Management Plan Amendment Final Environmental Impact Statement, 1992.
Table has been updated for the FEIS.

Reminder

ACEC: *Area of Critical Environmental Concern*

Saddle Mountain Management Area is crossed by Segments B_{NORTH}, B_{SOUTH}, D, E, and F, see Map 7, Land Ownership.

The Preferred Alternative and Alternatives 1 and 1A cross the Saddle Mountain Management Area of the Spokane District, for which the Saddle Mountain Recreation Management/Implementation Plan applies. This plan provides management objectives for important resources including minerals, livestock grazing, recreation, wildlife habitat, soils, and watersheds. The objectives of this plan and the actions that BPA would take to be consistent with this plan are described in Table 5.5-4, *Saddle Mountain Management Area Resource Management Objectives*.

Table 5.5-4
Saddle Mountain Management Area
Resource Management Objectives

Resource Management Objectives	Consistency
1. Manage public lands and keep access routes open for a variety of recreational opportunities/ experiences, including both motorized and non-motorized activities.	▪ No existing access routes on public land would be closed to the public as a result of the construction and operation and maintenance of a new transmission line, unless the landowner requests that access be limited or closed.
2. Keep public lands open for public purposes such as the exploration and/or development of mineral resources, rights-of-way, or access.	▪ Establishing a right-of-way for a new transmission line is a use for which the public lands are kept open. ▪ Mitigation for various resource concerns is discussed in Chapter 4, *Environmental Consequences*.
3. Enhance resource management efficiency through land tenure adjustments. Identify opportunities for jurisdictional transfers, cooperative management agreements with other agencies, or private individuals.	▪ No land tenure adjustments would result from the construction or operation and maintenance of the transmission line.
4. Protect and/or enhance federally sensitive, threatened, or endangered species habitat.	▪ BPA would conduct surveys of the project site within the Saddle Mountain Management Area for plants and animals listed or proposed for listing as threatened or endangered, and for BLM Sensitive Species or their habitats. ▪ BPA would consider the impacts of the project on sensitive proposed or candidate T&E species. Mitigation detailed in Sections 4.4.10, 4.5.10, and 4.3.8, *Recommended Mitigation*, would minimize the need for future listings by either the federal or state governments. ▪ BPA would comply with the Endangered Species Act and would conduct the appropriate level of consultation with the US Fish and Wildlife Service and National Marine Fisheries Service.
5. Provide for safe use of the Saddle Mountains.	▪ BPA would take precautions to minimize impacts to public health and safety during the construction and operation and maintenance of a new transmission line. ▪ Precautions would be taken for electric and magnetic fields, noise, toxic and hazardous materials, and fire. (See Section 4.11, *Public Health and Safety*).

Resource Management Objectives	Consistency
6. Protect and/or minimize impacts to important values such as cultural and archaeological resources, traditional and cultural properties, Native American sacred sites, or special status species.	▪ Cultural and historic resources would be protected and preserved to the extent possible. Mitigation for these resources is detailed in Section 4.10.5, *Recommended Mitigation.* ▪ BPA would comply with Sections 106 and 110 of the National Historic Preservation Act (NHPA), the Archeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the National Environmental Protection Act (NEPA), and Executive Order 13007. ▪ BPA would consult with the Washington State Historic Preservation Officer (SHPO) through the Office of Archaeology and Historic Preservation (OAHP), affected Native American tribes, local governments, and the public to protect cultural resources.

Source: Recreation Management/Implementation Plan, Saddle Mountain Area—April 1997.
Table has been updated for the FEIS.

5.5.1.2 U.S. Department of Defense (DOD) – Yakima Training Center (YTC)

Reminder

See Map 7, Land Ownership.

All of the alternatives (Segments A, B, and C) cross the YTC, which is managed by the US Army. The number one priority of the YTC is military training, which involves developing the skills and techniques necessary to fight, survive, and prevail in a wide variety of contingencies (U.S. Army, 2001). In concert with these military training goals, protection of environmental resources is also part of the YTC management program. A Cultural and Natural Resources Management Plan (CNRMP) identifies and supports military use of the YTC while managing the existing cultural and natural resources. The overall goals of the CNRMP and the actions that BPA would take to be consistent with the plan are described in Table 5.5-5, *Yakima Training Center CNRMP Goals*.

Table 5.5-5
Yakima Training Center CNRMP Goals

Goals	Consistency
1. Ensure YTC's ability to support and preserve military training.	▪ All alternatives (Segments A, B) locate a new transmission line adjacent to an existing line. The existing transmission lines were in place prior to this land area becoming part of the YTC. As a result, the U.S. military has tailored its use of this area to accommodate existing transmission line facilities. ▪ Alternative 3 (Segment C) requires a new right-of-way and transmission line in an area where training maneuvers are not currently designed to work around such facilities. Live mortar training would need to be eliminated and ground maneuvers would also be affected. ▪ BPA would work closely with the Army to minimize conflicts and inconvenience from construction and maintenance activities.
2. Use a long-term, ecosystem management approach.	▪ BPA would consider direct, indirect and cumulative impacts of the project on the environment. Mitigation for these impacts would be employed. (*See Chapter 4, Environmental Consequences*).
3. Integrate resource management goals within and among watersheds.	▪ BPA would apply the resource goals (listed below) within and among all watersheds crossed by the proposed project on the YTC.
4. Promote land management flexibility by using adaptive management strategies.	▪ Through the NEPA process, BPA would incorporate the concepts of adaptive management (land ecology, human desires and needs, and technology and economics) into the project decision-making process.
5. Develop management strategies that mitigate military training impacts.	▪ BPA proposes mitigation measures for impacts to resources, including military training, that would be caused by the construction and operation and maintenance of a new transmission line. Resource impacts and mitigation strategies are described in *Chapter 4, Environmental Consequences*.

Goals	Consistency
6. Strive to meet the cultural and natural resource goals identified in each resource area (identified below).	
Soils and Geology To maintain or improve soil resources that provide the basis for healthy, productive ecosystems.	▪ BPA would preserve existing vegetation where possible, and stabilize disturbed areas. As soon as practicable, stabilization measures would be started where construction activities have temporarily or permanently ceased. ▪ BPA would avoid riparian areas, drainage ways, canals, and other water bodies where possible. When these areas cannot be avoided, BPA would apply erosion control measures to prevent degradation of riparian or stream quality at the local and watershed level. ▪ BPA would prepare a stormwater pollution prevention plan (as required under the National Pollution Discharge Elimination System General Permit). ▪ Other mitigation to protect soils and geology is detailed in Section 4.1.4, *Recommended Mitigation*.
Water Resources To meet State of Washington surface water quality standards (WAC 173-201A-030), promote sustained survival of aquatic macro-invertebrate communities, and support water quality management efforts in the Yakima and Columbia River basins.	▪ BPA would set crossing structures as far back from stream banks and other water bodies as far as possible. BPA would avoid refueling and/or mixing hazardous materials where accidental spills could enter surface or groundwater. ▪ BPA would locate structures outside the Columbia River Shoreline area to the extent possible (consistency with the Shoreline Management Act described in Section 5.11.1, *Shoreline Management Act*). ▪ BPA would design the project to comply with local ordinances and state and federal water quality standards, to prevent degradation of aquifers and not jeopardize their usability as a drinking water source. ▪ BPA would prepare a stormwater pollution prevention plan (as required under the National Pollution Discharge Elimination System General Permit). ▪ Additional mitigation measures to protect water resources is described in Section 4.1.4, *Water Resources, Soils, and Geology*.

Goals	Consistency
Upland Vegetation To maintain or restore upland vegetation in a diverse mosaic of plant communities in support of a range of functions.	▪ Prior to construction, BPA would survey the Preferred Alternative for known occurrences and potential areas of rare plant species. ▪ BPA would avoid high-quality native plant communities if possible. If not avoidable, BPA would minimize impacts to these communities. If possible, structures and roads would be placed to avoid impacting high-quality native plant communities. ▪ BPA would prepare a ROW Maintenance Plan to designate which species are appropriate for restoration in certain areas. It would include specifications for planting, including the appropriate time to plant. ▪ A checklist would be prepared for the management of the ROW vegetation. BPA would reseed disturbed areas with native seed mix approved by YTC. ▪ Specific mitigation for impacts to vegetation is detailed in Section 4.3.8, *Recommended Mitigation*. ▪ BPA would survey for noxious weeds before and after construction. Weed control efforts would be conducted during and after construction to minimize the spread of noxious weeds. Specific measures to mitigate for noxious weeds in detailed in Section 4.3.8.4, *Minimize the Introduction and Spread of Weeds.*
Riparian and Wetland Resources To provide ecologically healthy and functioning riparian and wetland areas on YTC.	▪ BPA would avoid impacts to riparian habitat areas, wetlands, and floodplains to the extent possible by locating structures outside these resource boundaries. If impacts cannot be avoided, mitigation measures to minimize impacts is detailed in Section 4.2.8, *Recommended Mitigation*.
Wildlife To provide self-sustaining wildlife populations.	▪ BPA would conduct surveys of the Preferred Alternative for wildlife listed or proposed for listing as threatened or endangered, or their critical habitats. ▪ BPA would consider the impacts of the Preferred Alternative on sensitive, proposed, or candidate T&E species. Mitigation detailed in Section 4.4.10, *Recommended Mitigation*, would minimize the need for future listings by either the federal or state governments. ▪ BPA would comply with the Endangered Species Act and would conduct the appropriate level of consultation with the US Fish and Wildlife Service.

Goals	Consistency
Fish Resources To provide an ecologically healthy and functioning native fishery.	▪ BPA would consider the impacts of the Preferred Alternative on sensitive, proposed, or candidate T&E species. Mitigation detailed in Section 4.5.10, *Recommended Mitigation*, would minimize the need for future listings by either the federal or state governments. ▪ BPA would comply with the Endangered Species Act and would conduct the appropriate level of consultation with the US Fish and Wildlife Service and National Marine Fisheries Service.
Cultural Resources To identify and manage historic properties and traditional resources.	▪ Cultural and historic resources would be protected and preserved to the extent possible. Mitigation for these resources is detailed in Section 4.10.5, *Recommended Mitigation*. ▪ BPA would comply Sections 106 and 110 of the National Historic Preservation Act (NHPA), the Archeological Resources Protection Act (ARPA), the Native American Graves Protection and Repatriation Act (NAGPRA), the National Environmental Protection Act (NEPA), and Executive Order 13007. ▪ BPA would consult with the Washington State Historic Preservation Officer (SHPO) through the Office of Archaeology and Historic Preservation (OAHP), affected Native American tribes, local governments, and the public to protect cultural resources.
Recreation To provide outdoor recreational opportunities without compromising public safety, negatively impacting natural resources, or interfering with military training.	▪ BPA would evaluate impacts to recreational activities (Section 4.9, *Recreational Resources*). ▪ Impacts to recreation activities would occur during construction and be of short duration. ▪ Construction and operation and maintenance of a new transmission line would not permanently affect recreation activities or access to recreation sites since most recreation is dispersed and would undergo temporary, minor relocation during construction.

Source: Cultural and Natural Resources Management Plan, 2001. Table has been updated for the FEIS.

5.5.1.3 U.S. Department of Energy (USDOE) – Hanford Reach National Monument and Hanford Site

The Preferred Alternative and Alternatives 1 and 1A (Segments D, E, and F) cross areas of the Hanford Site and the Hanford Reach National Monument owned by the USDOE and managed by USDOE and the USFWS. The 586-square-mile Hanford Site was created in 1943 through the acquisition and consolidation of private lands with existing government land for the purpose of producing nuclear materials for national defense. In the late 1980's the USDOE's primary mission for the Hanford Site changed from defense materials production to environmental restoration, in particular, the cleanup of radioactive and hazardous materials stored on the site. As part of the new mission, and to fulfill existing USDOE requirements, USDOE developed a Comprehensive Land Use Plan (CLUP) for the Hanford Site. In 1999, the USDOE issued a Record of Decision (ROD) adopting a CLUP defined as the Preferred Alternative in the Final Hanford Comprehensive Land-Use Plan EIS (HCP-EIS) (USDOE, 1999).

➡ Reminder

See Map 7, Land Ownership.

The south end of Alternatives 1 and 1A (Segments E and F) and the Hanford Substation are located on land designated in the CLUP as Conservation (areas managed for the management and protection of archaeological, cultural, ecological and natural resource- limited mining could occur as a special use). Excepting Hanford Substation, land use along the southern ends of Alternatives 1 and 1A within the Hanford Site and Hanford Reach National Monument are designated as Preservation (areas managed for the preservation of archaeological, cultural, ecological, and natural resources).

Any physical development or land use activity occurring in the Preservation designation or in the Conservation designation, which does not meet the definition of a categorical exclusion under the DOE NEPA regulations, is defined as a Special Use, and subject to review and approval from USDOE before being allowed. All alternatives would cross land that would fall within the Special Use category.

The Hanford CLUP furthermore identifies five policies associated with Utility and Transportation corridors. Table 5.5-6, *Hanford CLUP Utility and Transportation Policies*, lists each policy and describes how BPA would meet the intent of each policy.

Table 5.5-6
Hanford CLUP Utility and Transportation Policies

CLUP Policy	Consistency
1. With to-be-identified exception(s), existing utility and transportation corridor rights-of-way are the preferred routes for expanded capacity and new infrastructure.	Line Segments are located adjacent to or near existing utility corridor rights-of-way.
2. Existing utility corridors that are in actual service, clearly delineated, and of defined width, are not considered "nonconforming" uses in any land-use designation.	The utility corridor established for this project would be in service, and would therefore not be a "nonconforming" use.
3. Utility corridors and systems without the characteristics of Number 2 (above) are considered to be nonconforming uses and shall be identified in the applicable RMP or AMP.	Not applicable.
4. Avoid the establishment of new utility corridors within the Conservation and Preservation designations unless the use of an existing corridor(s) is infeasible or impractical.	In order to maintain the required separation between transmission lines, existing corridors would need to be slightly expanded for the Preferred Alternative (2) (Segment D), or new corridors would be constructed parallel to existing corridors Alternatives 1 and 1A (Segments E and F).
5. Avoid the location of new above-ground utility corridors and systems in the immediate viewshed of an American Indian sacred site. Prioritize for removal, as funding is available, existing nonconforming utility corridors and systems in such areas.	American Indian sacred sites have not been identified. A cultural resource survey will be conducted and tower and access road placement adjusted to the extent possible.

5.5.1.4 U.S. Fish and Wildlife Service (USFWS)

➡ Reminder

See Map 7, Land Ownership.

The USFWS has several roles to fulfill in association with the proposed project. As the agency responsible for overseeing federally listed threatened and endangered species (See Section 5.2, *Endangered and Threatened Species*), they must ensure that the project does not jeopardize the continued existence of any listed species or contribute an unwarranted adverse effect to such species. Also, as managers of the Columbia National Wildlife Refuge and the Hanford Reach National Monument, they must manage the area for natural resource and conservation values.

Columbia National Wildlife Refuge – The Preferred Alternative and Alternative 1 (Segments D and E) cross an isolated parcel of the Columbia National Wildlife Refuge at the mouth of Crab Creek. This parcel is owned and managed by the USFWS. The USFWS does not presently have a Comprehensive Conservation Plan for the management of this refuge. An easement to cross USFWS lands would be required from the USFWS, and a compatibility determination, under the National Wildlife Refuge System Act, must be made. A Determination of Compatibility has been done by the USFWS and is included in Appendix L, *Columbia National Refuge Determination of Compatibility*. All measures as described in the Determination of Compatibility have been agreed to by BPA and compliance with these terms will be required for BPA to obtain an easement to cross the refuge.

Hanford Reach National Monument/Fitzner-Eberhardt Arid Lands Ecology Reserve – The USFWS has managed USDOE-owned lands under a USDOE permit in the Hanford Site area since 1971 when it took over management of the Saddle Mountain Wildlife Refuge area on the north side of the Columbia River. More recently, USFWS took over management of the Fitzner-Eberhardt Arid Lands Ecology Reserve (ALE) from the USDOE in 1997. Management of the Wahluke Slope was assigned to the USFWS and WDFW in 1971. In 1999, the USFWS and WDFW agreed that the USFWS would assume management of the Wahluke Slope.

In 2000, the entire area north of the Columbia River, the Hanford Reach of the Columbia River, the Saddle Mountain National Wildlife Refuge, and the ALE was declared the Hanford Reach National Monument, owned by USDOE but with the USFWS responsible for managing much of the Monument area under permit from the USDOE. However, the USDOE manages the McGee/Riverlands area around Midway and the quarter-mile strip along the Columbia River on the south and west bank. The Preferred Alternative and Alternatives 1 and 1A (Segments D, E, and F) all pass through parts of the Hanford Reach National Monument managed by USFWS.

Specific management plans for the Hanford Reach National Monument have not yet been developed by the USFWS, so their applicability to the proposed project cannot be assessed. However, the Monument Proclamation includes a specific reference to upgrades to the Federal Columbia River Transmission System and states that:

> "Replacement, modification, and expansion of existing Federal Columbia River Transmission System facilities, and construction of any new facilities, within the proposed monument, as authorized by other applicable law, may be carried out in a manner consistent with the proper care and management of the objects identified in the draft proclamation, as determined in accordance with the management arrangements set out in the draft proclamation."

5.5.2 State

➡ Reminder

See Map 7, Land Ownership.

No conflicts with state land use plans or programs are anticipated. BPA would work with state agency representatives to minimize conflicts between proposed activities and land use plans. BPA would strive to meet or exceed the substantive standards and policies of the following regulations: State Environmental Policy Act, Growth Management Act, Shoreline Management Act, Hydraulic Project Approval, Forest Practices Act, and noxious weed control.

BPA would submit a Joint Aquatic Resources Permit Application (JARPA) and agree to construct culverts consistent with the design criteria outlined in a Hydraulic Project Approval (Chapter 75.20 RCW, Chapter 220-110 WAC), which has a goal to protect fish in waters of the state. More details on consistency with these plans are provided in Appendix H, *Consistency with State and Local Government Regulations*.

5.5.3 Counties

Alternatives would be located in Kittitas, Grant, Benton, and Yakima Counties in central Washington State. There are no incorporated cities or towns crossed by the alternatives. Table 5.5-7, *Zoning Designations Crossed by the Alternatives in Each County*, identifies zoning designations by county.

Table 5.5-7
Zoning Designations Crossed by the Alternatives in Each County

	Counties			
	Kittitas	**Grant**	**Benton**	**Yakima**
Zoning Designations	Forest and Range	Rural Light Industrial	Unclassified	Agricultural
	Agricultural-20	Rural Remote	GMA Agricultural	
		Rural Residential 3		
		Open Space Conservation		
		Agricultural		
		Public Open Space		

BPA would work with county planners to minimize conflicts between proposed activities and county land use plans by striving, as much as possible, to meet or exceed the substantive standards and policies of the county zoning ordinances and comprehensive plans. More details on consistency with these plans are given in Appendix H, *Consistency with State and Local Government Regulations*.

BPA would also work with County Noxious Weed Control Boards to minimize the risk of spreading or introducing noxious weeds as a result of construction activities. More details on noxious weed control are provided in Appendix H, *Consistency with State and Local Government Regulations*.

5.6 Farmland Protection

The Farmland Protection Policy Act (PL 97-98; 7 USC 4201 et seq.) directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands. The Act's purpose is to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses.

The location and extent of prime farmlands designated by the Natural Resource Conservation Service (NRCS) were obtained from NRCS soil survey information. Lists of unique, statewide, and locally important farmlands in Washington are in the process of being updated and certified; thus, are unavailable for consideration (Hipple, 2001).

Portions of all the alternatives cross soils designated by the NRCS as "prime farmland if irrigated." Prime farmland would be permanently affected if structures were located on designated soils. Farmland would not be permanently affected if the transmission line could span the designated soils. Table 5.6-1, *Distance and Percentage of Prime Farmland Crossed by Alternative*, lists the extent to which each alternative crosses soil designated as "prime if irrigated." Table 5.6-2, *Estimated Improvements on Lands Designated "Prime Farmland if Irrigated,"* lists the estimated number of structures and miles of access roads that would be built on these lands, while Table 5.6-3, *Estimated Area of Affected "Prime Farmland if Irrigated,"* identifies the estimated temporary and permanent area of effect from these improvements.

For Your Information

Prime Farmland *is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, livestock, timber, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and/or labor. It does not include land already in or committed to urban development or water storage (USDA, NRCS web page).*

Table 5.6-1
Distance and Percentage of
Prime Farmland Crossed by Alternative

Soil Classification	Alternative 1	Alternative 1A	Alternative 2 (Preferred)	Alternative 3	TOTAL
Not Prime	57.97 mi. (93.1%)	65.07 mi. (93.3%)	57.35 mi. (90.0%)	55.30 mi. (96.0%)	**235.69 mi. (93%)**
Prime if Irrigated	4.3 mi. (6.9%)	4.7 mi. (6.7%)	6.4 mi. (10.0%)	2.3 mi. (4.0%)	**17.7 mi. (7%)**
Always Prime	0	0	0	0	**0**
TOTAL	**62.27 mi.**	**69.77 mi.**	**63.75 mi.**	**57.6 mi.**	**253.39 mi.**

New table for the FEIS.

Table 5.6-2
Estimated Improvements on Lands Designated
"Prime Farmland if Irrigated"

Improvement	Alternative 1	Alternative 1A	Alternative 2 (Preferred)	Alternative 3
Structures	18	21	27	10
Access Roads	7.6 mi.	7.6 mi.	7.4 mi.	7.7 mi.

New table for the FEIS.

Table 5.6-3
Estimated Area of Affected
"Prime Farmland if Irrigated"

Area of Impact from		Alternative 1	Alternative 1A	Alternative 2 (Preferred)	Alternative 3
Structures	**Temporary**	7.4 ac	8.4 ac	10.8 ac	4.1 ac
	Permanent	0.4 ac	0.4 ac	0.5 ac	0.2 ac
Access Roads	**Temporary**	5.5 ac	5.5 ac	5.4 ac	5.4 ac
	Permanent	2.6 ac	4.9 ac	3.1 ac	6.5 ac
Total Temporary		**12.9 ac**	**13.9 ac**	**16.2 ac**	**9.5 ac**
Total Permanent		**3.0 ac**	**5.3 ac**	**3.6 ac**	**6.7 ac**
TOTAL	**TOTAL**	**15.9** ac	**19.2** ac	**19.8** ac	**16.2** ac

New table for the FEIS.

Project alternatives would have minimum impact on area farmlands since:

- No additional nonfarmland would be created due to interference with existing land patterns except for the immediate area surrounding structures.

- Agricultural operations within the corridor are currently affected by the existing line.
- Impacts to existing substantial and well maintained on-farm investments would be minimized.
- The alternatives would not cause the agricultural use of adjacent farmlands to change, nor jeopardize the continued existence of area farm support services.

Any farmland that would be proposed to be converted to nonagricultural uses would require approval by the NRCS. Federal agencies intending to convert farmland to nonagricultural uses must complete form AD-1006, the Farmland Conversion Impact Rating form, and submit it to the local NRCS field office for review.

5.7 Floodplain/Wetland Assessment

In accordance with USDOE regulations on compliance with Floodplain/Wetland environmental review requirements (10 CFR 1022.12) and Executive Orders 11988 and 11990, BPA has prepared the following assessments of the impacts of the alternatives on floodplains and wetlands. BPA published a notice of floodplain/ wetland involvement for this project in the Federal Register on November 9, 2000.

5.7.1 Resource Description

The need and purpose of the project are described in Chapter 1, *Purpose and Need*. Map 4, *Water Resources*, (in Chapter 3) shows locations of floodplains with respect to the alternatives. The locations of the 100-year floodplains were determined from Flood Insurance Rate Maps published by the Federal Emergency Management Agency (FEMA), U.S. Department of Housing and Urban Development.

Wetlands that would be affected by the alternatives were preliminarily identified by three methods: National Wetland Inventory Maps prepared by the USFWS for Washington, aerial photo interpretation, and reconnaissance level field inspections (See Map 4, *Water Resources*, in Chapter 3). A wetland delineation was conducted on the Preferred Alternative to determine the actual boundaries and characteristics of wetland areas.

5.7.2 Floodplain/Wetland Effects

Floodplain impacts are discussed in Section 4.2, *Floodplains and Wetlands*. Based on engineering design of the Preferred Alternative, two floodplains (Wilson/Naneum Creek and Dry Creek) would be impacted. Wilson/Naneum Creek would require a new access road and a structure within the floodplain. Dry Creek would require a new access road with two 9-foot arch culverts. Soil and vegetation would be disturbed where improvements need to be made to existing access roads within floodplains or new access roads need to be constructed across floodplains. There are no existing access roads to be upgraded within floodplains.

The new access roads and structure within the Wilson/Naneum and Dry Creek floodplains would not significantly increase the risk of flooding or flood damage.

As stated in Section 4.2, *Floodplains and Wetlands,* there are 7 wetlands crossed by the Preferred Alternative. One wetland at Caribou Creek and one at Lower Crab Creek would both be avoided (no impact), wetlands associate with Wilson and Cooke Creeks would have trees removed (moderate impact), an unnamed wetland would have an existing road reconstructed (low impact), a wetland at Wilson/Naneum Creek would have a portion of a new tower constructed (moderate impact).

Construction, operation, and maintenance of the project is not expected to significantly affect the long-term existence, quality, or natural and beneficial values of the wetlands involved. Activities in wetlands would be coordinated with the U.S. Army Corps of Engineers (Walla Walla District) and Washington state and county regulatory agencies. The appropriate permits are being acquired (see Section 5.16).

5.7.3 Alternatives

Under Executive Orders 11988 and 11990, developments on floodplains and in wetlands are discouraged whenever there is a practical alternative. Table 5.7-1, *Possible Floodplain and Wetland Impact Occurrences*, estimates the number of potential floodplain and wetland impact occurrences for each alternative being considered. The magnitude of impact would be determined and site-specific mitigation would be employed to avoid or minimize impacts to floodplain and wetlands.

Table 5.7-1
Possible Floodplain and Wetland Impact Occurrences

Type of Possible Impact	Number of Impacts in Each Alternative			
	Preferred (2)	1	3	1A
Possible crossing of floodplain or wetland requiring a culvert or ford for an access road	2	6	13	4
Structures built in wetland or floodplain, if unavoidable	1*	3	1	3
Areas where tall trees within floodplains or wetlands may be removed	2	4	2	4

* One structure would be within the same floodplain as an access road.
Table has been updated for FEIS.

Wetlands and floodplains that would be crossed by the alternatives are discussed in Section 4.2, *Floodplains and Wetlands*.

Alternatives 1 and 1A would include the same impacts to the floodplains and wetlands as the Preferred Alternative, except for the Dry Creek floodplain, which would not be part of either alternative. No floodplain impacts would occur at Nunnally Lake. Placing structure in the floodplains of Lower Crab Creek and the Columbia River will be avoided if possible. Tree removal may be necessary within wetlands at Nunnally Lake and Lower Crab Creek. Access road crosses may be built within 4 and 2 potential wetlands for Alternatives 1 and 1A respectively. If Alternative 1 or 1A is chosen for construction, wetland delineations would occur to assess actual impacts.

Alternative 3 would include the same impacts to floodplains and wetlands as the Preferred Alternative. No other impacts to floodplains would occur. Eleven other potential wetlands may be crossed by new access roads. Structures would not be placed within wetlands. If Alternative 3 is chosen for construction, wetland delineations would occur to assess actual impacts.

The No Action Alternative is not expected to effect floodplains or wetlands and is discussed in more detail along with the other alternatives in Chapter 2, *Alternatives*.

5.7.4 Mitigation

Mitigation for site-specific impacts is discussed in Section 4.2.8, *Recommended Mitigation*. Included in these mitigation practices are best management practices to minimize erosion, sedimentation, and the spread of noxious weeds. BPA has avoided, to the greatest extent possible, siting structures and new access roads in wetlands or floodplains. BPA conducted a wetland field survey along all access roads and existing and new ROW, for the Preferred Alternative. Wetlands directly affected by construction were delineated to ensure full compliance with the Clean Water Act. BPA is working with the appropriate agencies to mitigate any actions that would impact the function of wetlands, and will incorporate its mitigation actions in the mitigation action plan.

For Your Information

*The **Executive Order on Environmental Justice** (Executive Order 12898) was enacted in February 1994 to ensure that federal agencies do not unfairly inflict environmental harm on economically disadvantaged and minority groups within the United States or any of its territories.*

5.8 Executive Order on Environmental Justice

The ***Executive Order on Environmental Justice*** requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations. The U.S. Census Bureau defines minority individuals as those belonging to the following racial or ethic groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic Origin; or Hispanic. EPA Interim Guidelines on Environmental Justice (1998) define low-income as less than two times the poverty threshold/level. These parameters are partial factors in considering whether a potential environmental justice case exists. EPA Interim Guidelines recommend that environmental justice assessments use additional meaningful information and analyses to best determine if disproportionate impacts may result from a proposed action.

U.S. Census block group data for minority populations and populations with income below the poverty level were compared to the respective average county populations. Of the 10 block groups in the study area, four exceeded the county average racial minority population compositions and six exceeded the average Hispanic origin compositions for the respective counties. Two of the ten U.S. Census block groups indicate a higher percentage of individuals with income below the poverty level. Since block group areas extend substantially beyond the study area, additional analyses using aerial photographs were used.

An examination of aerial photographs investigated if residential, commercial, or industrial buildings were present in or near the study area. The results of the examination determined that most of the study area has no buildings of any type present such as when the project alternatives are located on undeveloped, grazed shrub-steppe lands, or public lands. In other areas, such as along agricultural lands in the Preferred Alternative and Alternative 1 (Segments D and E), there are scattered farms and associated homes and outbuildings typical of rural agricultural land use.

From this assessment of demographic data and aerial photography, it is determined that places where minority or low-income populations may reside, work, or otherwise spend large parts of their days are not highly or disproportionately concentrated within the study area. Alternatives considered for the project would therefore not adversely affect any minority or economically disadvantaged groups. For these reasons, the alternatives would not violate the intent of the Executive Order on Environmental Justice.

5.9 Displacements and Real Property Acquisition

The Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act) of 1970 (PL 91-646, 42 USC 4601 et seq.) ensures fair and equitable treatment of people whose real property is acquired or who are displaced as a result of a federal or federally assisted project. Government-wide regulations provide procedural and other requirements (appraisals, payment of fair market value, notice to owners, etc.) in the acquisition of real property and provide for relocation payments and advisory assistance in the relocation of people and businesses.

Two residences are expected to be relocated as a result of the Preferred Alternative. One residence is along Segment A and the other residence is along Segment D. Both displacements would be conducted in compliance with the Uniform Act.

BPA would acquire real property for the new Wautoma Substation. This property acquisition would also be conducted in compliance with the Uniform Act.

5.10 Global Warming

The U.S. EPA defines global warming as "the progressive gradual rise of the earth's surface temperature thought to be caused by the greenhouse effect and responsible for changes in global climate patterns" (EPA, 2001). Certain manmade and natural gases absorb and reradiate infrared radiation, which prevents heat loss to space. These gases are known as ***greenhouse gases***. Greenhouse gases include water vapor, carbon dioxide methane, chlorofluorocarbons, ozone, and nitrous oxides.

The greenhouse effect is a natural phenomenon that helps regulate the temperature of the Earth. If all of these greenhouse gases were to suddenly disappear, the Earth would be 60ºF colder and uninhabitable (EPA 2001). Although global warming occurred in the distant past as the result of natural influences, the term is most often used to refer to the warming predicted to occur as a result of increased emissions of greenhouse gases (EPA, 2001.) Human

For Your Information

*Gases contributing to global warming are called **greenhouse gases**. Greenhouse gases include: water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ground level ozone (and the pollutants which generate ground level ozone), and stratospheric ozone depleting substances such as chlorofluorocarbons and carbon tetrafluoride. CO_2 is the most common greenhouse gas in the atmosphere. Greenhouse gases warm the atmosphere by absorbing infrared radiation given off by the earth, preventing heat loss to outer space.*

activities that contribute to global warming include burning coal, oil, and gas, and cutting down forests.

Occasional trees or woody shrubs would be cleared that would release CO_2 and would eliminate CO_2-collecting vegetation; however, this would occur on a very small scale. To dispose of any cleared vegetation, it would be lopped and scattered on the ROW. This vegetation would then gradually degrade, releasing small quantities of carbon to the atmosphere over long periods of time. BPA does not expect to conduct any outdoor burning. Exceedingly low or no impact to global warming would occur from the project as a result of clearing or recycling vegetation.

5.11 Coastal Zone Management Consistency

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, WDOE administers the program. The Coastal Zone Management Act requires that 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). Consistency with the state program is described below.

5.11.1 Shoreline Management Act

In Washington, the Coastal Zone Management Act is carried out by the Shoreline Management Act. The Shoreline Management Act applies to all marine waters, streams, and a mean annual flow greater than 20 cubic feet per second (cfs), and lakes 20 acres or larger, as well as associated wetlands and floodplain areas.

The project would cross one river, two creeks, and one lake that are designated as shorelines of the state: the Columbia River in Kittitas, Grant, and Benton Counties; Naneum Creek in Kittitas County; and Nunnally Lake and Lower Crab Creek in Grant County.

Any applicant for a federal license or permit to conduct an activity in the Coastal Zone must certify that their project is consistent with the enforceable provisions of the state's Coastal Zone Management Plan. BPA would prepare either a consistency or a negative declaration, as required by the Coastal Zone Management Act.

5.12 Energy Conservation at Federal Facilities

Any modifications to the Schultz, Vantage, and Hanford Substations would not require the addition of new structures, such as control houses, but would use those already in existing substations. All alternatives using these substations therefore involve the continued use of buildings that would meet federal energy conservation design standards as they apply to existing structures.

The new Wautoma Substation would include a new control house that would meet federal energy conservation design standards.

5.13 Pollution Control at Federal Facilities

Several pollution control acts apply to this project and are discussed separately in the following sections.

5.13.1 Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) of 1976 (42 USC 6901 et seq.), as amended, is designed to provide a program for managing and controlling hazardous waste by imposing requirements on generators and transporters of this waste, and on owners and operators of treatment, storage, and disposal (TSD) facilities. Each TSD facility owner or operator is required to have a permit issued by EPA or the state. Typical construction and maintenance activities in BPA's experience have generated small amounts of these hazardous wastes: solvents, pesticides, paint products, motor and lubricating oils, and cleaners. Small amounts of hazardous wastes may be generated by the project. These materials would be disposed of according to state law and RCRA.

5.13.2 Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) of 1976 (15 USC 2601 et seq.) is intended to protect human health and the environment from toxic chemicals. Section 6 of TSCA regulates the use, storage, and disposal of PCBs.

BPA has adopted guidelines to ensure that PCBs are not introduced into the environment. Equipment proposed in any of the alternatives would not contain PCBs. Any equipment removed that may have PCBs would be handled according to the disposal provisions of TSCA.

5.13.3 Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) of 1972 (7 USC 136 et seq.) registers and regulates pesticides. BPA uses herbicides only under controlled circumstances. Herbicides are used on transmission line ROW and in substation yards to control vegetation, including noxious weeds.

When BPA uses herbicides, the date, dose, and chemical used are recorded and reported to state government officials. The herbicides are only used within the prescribed manners and methods as described on their labels. Herbicide containers are disposed of according to RCRA standards.

5.14 Noise Control Act

The Federal Noise Control Act of 1972 (42 USC 4903) requires that federal entities, such as BPA, comply with state and local noise requirements.

The WDOE limits noise levels at property lines of neighboring properties (WAC Chapter 173-040). The maximum permissible noise levels depend on the land uses of both the source noise and receiving property (Table 5.14-1, *Maximum Permissible Environmental Noise Levels*). The environmental designation for noise abatement (EDNA) is defined by the land use of a property. In general, residential uses are Class A, commercial are Class B, and industrial and agricultural are Class C.

Table 5.14-1
Maximum Permissible Environmental Noise Levels

EDNA of Noise Source	EDNA of Receiving Property		
	Class A	Class B	Class C
Class A	55 dBA	57 dBA	60 dBA
Class B	57	60	65
Class C	60	65	70

Source: WAC 173-60-040

Several exemptions apply to the project construction, operation, and maintenance (WAC 173-60-050). Sounds created by the installation or repair of essential utility services are exempt in all EDNAs between the hours of 7 a.m. and 10 p.m. Noise from electrical substations are exempt in all EDNAs and are without time restrictions. Sounds originating from temporary construction sites are exempt from noise limits except from 10 p.m. to 7 a.m. in residential areas.

A new transmission line in Washington state would not increase the ambient audible noise level along the transmission line route or in any of the substations. Installation, construction, and maintenance of the transmission line would comply with state noise regulations.

5.15 Emission Permits under the Clean Air Act

5.15.1 Class I – Protected Areas

The Federal Clean Air Act as revised in 1990 (PL 101-542, 42 USC 7401) requires the EPA and states to carry out programs intended to ensure attainment of the National Ambient Air Quality Standards. In Washington, EPA has delegated authority to WDOE.

Section 160 of the Clean Air Act requires the protection, preservation, or enhancement of air quality in national parks, wilderness areas, and monuments. The 1977 Clean Air Act amendments called for a list of existing areas to be protected under Section 160. These are called Class I areas (40 CFR 81 Subpart D). No Class I areas are located in or near the study area (see Section 3.13, *Air Quality*).

5.15.2 Permits for Open Burning

The state of Washington regulates outdoor burning. The purpose of this rule (173-425 WAC) is to eliminate open burning during periods of impaired air quality and in PM_{-10} and carbon monoxide nonattainment areas as well as in populated regions. BPA does not expect to conduct any outdoor burning.

5.15.3 Fugitive Dust

Controlling fugitive dust, or dust that is emitted from a source such as a construction site, is important in each of the four counties the proposed alternatives pass through. Prior to construction in Yakima County, a Project Dust Control Plan must be prepared and submitted to the Yakima Regional Clean Air Authority. In Kittitas, Grant, and Benton (outside the Tri-Cities urban area) Counties, submittal of a project dust control plan to the respective air authority is not required prior to construction. However, the Washington Administrative Code (WAC 173-400-040-(3)) requires that "reasonable precautions" be taken to prevent the release of air contaminants during construction. If a fugutive dust problem is present, the air authority may request a review of the Project Dust Control Plan and determine the necessary measures to correct the problem.

5.15.4 General Conformity Rule

The General Conformity Rule (40 CFR Part 51, Subpart W, 40 CFR Part 93 Subpart B, and 40 CFR Section 6.303) ensures that federal actions do not interfere with state programs to improve air quality in nonattainment areas. Because none of the alternatives are within a nonattainment area, they are not subject to General Conformity Requirements.

5.16 Discharge Permits under the Clean Water Act

For Your Information

*The **Clean Water Act** is also known as the federal Water Pollution Control Act.*

The ***Clean Water Act (CWA)*** regulates discharges into waters of the United States. Several sections of the CWA apply to the project as further described.

5.16.1 Section 401

Section 401 of the CWA requires that states certify compliance of federal permits and licenses with state water quality requirements. A federal permit to conduct an activity that results in discharges into waters of the United States is issued only after the affected state certifies that existing water quality standards would not be violated if the permit were issued. The Washington Department of Ecology would review each permit for compliance with state water quality standards.

5.16.2 Section 402

Section 402 of the CWA authorizes stormwater discharges associated with industrial and construction activities under the NPDES. In Washington, EPA has a general permit authorizing federal facilities to discharge stormwater from construction activities disturbing land of 1 or more acres into waters of the U.S., in accordance with various set conditions. BPA would comply with the appropriate conditions for this project, such as issuing a Notice of Intent to obtain coverage under the EPA general permit and prepare a Storm Water Pollution Prevention (SWPP) plan.

The SWPP plan helps ensure that erosion control measures would be implemented and maintained during construction. The SWPP plan would address best management practices for stabilization, stormwater management, and other controls (see Section 4.1.4, *Recommended Mitigation*).

5.16.3 Section 404

Authorization from the U.S. Army Corps of Engineers is required in accordance with the provisions of Section 404 of the CWA when there is a discharge of dredged or fill material into waters of the U.S., including wetlands. This includes excavation activities that result in the discharge of dredge material that could destroy or degrade waters of the U.S.

BPA has applied for permits to cross 27 waters of the U.S. with a combination of fords and culverts. Twenty-one of these crossings are existing crossings that are being reconstructed or upgraded. Six crossings are new. Construction, operation, and maintenance of the project is not expected to significantly affect the long-term existence, quality, or natural and beneficial values of the wetlands involved.

5.17 Underground Injection Permits under the Safe Drinking Water Act

The Safe Drinking Water Act of 1974 (42 USC sec 300f et seq.) is designed to protect the quality of public drinking water and its sources. BPA would comply with state and local public drinking water regulations. None of the alternatives would affect any sole-source aquifers or other critical aquifers or adversely affect any surface water supplies.

5.18 Permits from the U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers administers several permit programs, of which Section 404 of the Clean Water Act would apply. Section 404 is described in Section 5.16.3, *Section 404*.

The Corps' authorization is also required under Section 10 of the Rivers and Harbors Act for work or placement of structures below the ordinary high-water mark of, or affecting, navigable waters of the U.S. All of the alternatives would cross the Columbia River, which is a navigable water. Although no structures would be placed below the ordinary high water mark, the navigability of the Columbia River could be affected. BPA would submit an application to the Corps for a River and Harbor Act Section 10 permit. The Corps also authorizes the acceptable clearances for conductors crossing navigable waters. BPA would coordinate with the Corps to get conductor height approval.

5.19 Crossing State Lands

5.19.1 Department of Natural Resources (DNR)

Each alternative would cross lands and aquatic resources administered by DNR. The lands, for which there are no specific land management plans, are considered transition lands and have been designated for agricultural purposes. They are managed for the highest and best land use, which may be as agricultural crop fields or as open rangeland (G. Sheldon, 2001). State-owned aquatic resources are managed for long-term ecosystem and economic viability.

DNR's policy is to issue upland ROW easements for transmission lines crossing DNR lands and aquatic leases for crossing state-owned aquatic resources. The sale or granting of such easements across state lands is subject to review under the State Environmental Policy Act (SEPA). DNR may adopt an environmental analysis prepared under NEPA by following WAC 197-11-600 and WAC 197-11-630 (WAC 97-11-610) or may prepare separate documents in accordance with SEPA regulations.

5.19.2 Washington Department of Fish and Wildlife (WDFW)

Alternative 1A would cross the western edge of the Lower Crab Creek Wildlife Area, which is administered by WDFW. There are no specific management plans for this area. However, as a general rule the area is managed according to wildlife priorities, with preserving endangered species habitat and priority wildlife habitat as the first two land use management priorities. Other land use activities are permitted in those areas where such activities are deemed compatible with the preservation efforts (R. Kent, pers. comm., 2001).

WDFW's policy is to issue upland ROW easements for transmission lines crossing WDFW lands.

5.20 Crossing Federal Lands

5.20.1 U.S. Bureau of Land Management

Prior to construction of the new transmission line on BLM-administered lands, BPA would obtain right-of-way from the BLM. BLM must approve and issue a Right-of-Way Grant authorizing the construction and maintenance for the new transmission line. Typically, a Plan of Development is submitted with the Right-of-Way Application that thoroughly describes the project and its associated impacts. A Temporary Use Permit would also be obtained for additional area necessary for construction, material stockpiling, access, and so forth.

5.20.2 Yakima Training Center (YTC)

A permit to construct and operate a transmission line across the YTC would be required.

5.20.3 USDOE Approvals

USDOE must give approval to projects that cross the Hanford Site, which includes issuing a real estate permit for the new right-of-way. A Use Request is submitted to the Real Estate Officer (REO), who determines if the project is an Allowable Use or a Special Use. If it is a Special Use, the REO submits it to the Site Planning Advisory Board (SPAB) for approval, approval with conditions or denial. If the project is an Allowable Use, or a Special Use that the SPAB recommends for approval, the REO coordinates the Use Request processing with the NEPA compliance officer. The NEPA compliance officer reviews and approves the EIS and coordinates with other permit processes, including SEPA.

5.20.4 U.S. Fish and Wildlife Service (USFWS)

USFWS must issue a ROW easement for the project to cross the Columbia National Wildlife Refuge. A determination of compatibility with the Refuge System or purpose of the refuge per the National Wildlife Refuge System Improvement Act (50 CFR Parts 25-29) must be obtained (see Appendix L, *National Refuge Determination of Compatibility*).

5.20.5 U.S. Bureau of Reclamation (BOR)

The BOR and the BPA entered into a Memorandum of Understanding (MOU) in 1944 that allowed BPA to construct transmission lines across BOR lands and canals. To obtain permission for the project (the Preferred Alternative and Alternatives 1 and 1A) to cross BOR lands and canals, BPA would have to submit a map and narrative describing the location of the proposed route. BOR would then write a supplement to the 1944 MOU that would allow the construction and operation of the transmission line. Both the Yakima office and the Ephrata office would need to be contacted to conduct these MOU supplements.

5.21 Notice to the Federal Aviation Administration

As part of transmission line design, BPA seeks to comply with FAA procedures. Final locations of structures, structure types, and structure heights are submitted to FAA for the project. The information includes identifying structures taller than 200 feet above ground and listing all structures within prescribed distances of airports listed in the FAA airport directory. BPA also assists the FAA in field review of the project by identifying structure locations. The FAA then conducts its own study of the project, and makes recommendations to BPA for airway marking and lighting. General BPA policy is to follow FAA recommendations.

Chapter 6 – Comments and Responses

In this Chapter:

- **Comments**
- **Responses**

The Draft EIS was distributed to agencies, groups, individuals and libraries on February 8, 2002. A 45-day public review period ended on March 25, 2002. Public meetings with an open house format were held in Ellensburg, Desert Aire and Richland Washington to review and receive comments on the Draft EIS. Comments were also received via phone, mail and email.

A follow-up letter was sent to people interested in the project on April 15, 2002. The letter identified the focus of comments received during the comment period and notified people of environmental and project design activities that would be occurring in the project area.

This chapter records and provides responses to the comments on the Draft EIS. This Final EIS also provides updated information developed based on comments received on the Draft EIS as well as additional information that has become available. Additions to the document are displayed as underlined text.

This chapter contains the written comments from letters and comment sheets, and oral comments from public meetings. Letter and comment sheets were recorded in the order they were received. Separate issues in each letter were given separate codes, for example, 1-1, 1-2, 1-3, etc. for issues in the first letter received. Comments from the public meetings were recorded similarly and are listed with code EL for comments from the public meeting held in Ellensburg, Washington, DA for comments from the public meeting held in Desert Aire, Washington, and RI for comments from the public meeting held in Richland, Washington. BPA prepared responses to individual comments. This chapter contains the coded comments from the letters and public meetings first, followed by the coded responses beginning on page 6-62.

Public Comments

Schultz-Hanford DEIS

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-001
RECEIPT DATE:
FEB 13 2002

Telephone comment by Ginny Kuehn
2/13/02

(Dr.) Richard Koch
Olympia, WA

(360) 352-7616 - office
(360) 352-8197 - home

1-1 I am in favor of BPA's construction of the 500kV transmission line from BPA's substation Schultz to a new and existing substation near the USDOE and Hanford Reservation. I own land, 1600 acres right in that general area, 26 miles east of Moxee City.

1-2 Keep up the good work!

Schultz-Hanford DEIS

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-002
RECEIPT DATE:
FEB 13 2002

Telephone comment by Ginny Kuehn
2/13/02

Warren Hall
(no other information given)

2-1 I received a letter from BPA regarding the new power line down across the Hanford energy reservation. I am in favor of that new power line going in there. So, rather than writing a letter, I called and responded to your letter. This can be a public record.

Public Comments

BPA F 1325.09e
(07-1999)
(Previously OF 271)

Electronic Version Approved
by CIL – 01/05/1999

U.S. DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION
CONVERSATION RECORD

TIME: 4:00 p.m.
DATE (MM/DD/YYYY): 2/13/02

LOCATION OF VISIT/CONFERENCE: N/A

NAME OF PERSON(S) CONTACTED OR IN CONTACT WITH YOU:
Julidta Tarver
Personal Representative for John Nelson

TYPE:
☐ Visit
☐ Conference
☒ Telephone
☒ Incoming
☐ Outgoing
☐ Other (Specify)

ROUTING:
RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-003
RECEIPT DATE: FEB 14 2002

ORGANIZATION/OFFICE:
TELEPHONE NUMBER: 206-546-6208

SUBJECT: Schultz-Hanford Area Project

SUMMARY

3-1 I received a call from Ms. Tarver regarding property owned by John Nelson, her cousin, who is now deceased. Property involves several parcels in section 34 and one in section 27, Township 16 North, Range 23 East, Grant County, WA. Mr. Tarver requested information on location of the line and value of any easement BPA might want to acquire. In reviewing the proposed route, none of the parcels in sections should be effected. I explained that though the final route would not actually be determined until the ROD is issued that BPA's appraiser had already been working on values and as currently scheduled, someone would most likely be contacting her in the late March early April timeframe. She working on settling this estate and would like the sell the property.

ACTION REQUIRED

SIGNATURE: Paula J. Campbell
TITLE: Realty Specialist
DATE (MM/DD/YYYY): 2/13/02

ACTION TAKEN

SIGNATURE
TITLE
DATE (MM/DD/YYYY)

FILE CODE: N/A
RETENTION: N/A

LOG#: SHDEIS-004
RECEIPT DATE: FEB 20 2002

Kuehn, Ginny -KC-7

From: Driessen, Laurens C - TNP-TPP-3
Sent: Wednesday, February 20, 2002 12:12 PM
To: Wittpenn, Nancy A - KEC-4; Campbell, Paula J - TRF/Bell-1; Tyson, Ivy L - TNLC-TPP-3; Kuehn, Ginny -KC-7; Rosales, Mari - TRF/Bell-1
Subject: Schultz - Hanford Area, phone call - Fran Chmelewski

4-1 Fran called me today. She lives along Gage Rd. and is very concerned about our reroute around the Indian Allotment property. She really does not like the reroute for it would be a lot closer to her home which is located at the intersection of Gage Rd. and Cooke Canyon Rd. We apparently are already sending her the DEIS. I faxed her map #3 which has the details for that reroute. She would like to be kept up to date. Very concerned. She is a lawyer representing herself. Was nice to talk to.

Lou

1

Public Comments

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SH DEIS—005
RECEIPT DATE: FEB 26 2002

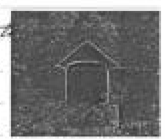
STUCKRATH
1235 Northwind Circle
Bellingham, WA 98226

2-16-02

Lou Driessen
Project Manager
Dept. of Energy
Bonneville Power Adm.
Communication - KC-7
P.O. Box 12999
Portland, Or. 97212

5-1 Dear Sirs:
I don't object to a new Transmission line - Schultz-Hanford area as long as it isn't crossing my property - Hanford - Wautoma.
I already have electric line crossing my property & 2 roads.

Sincerely,
V Joyce Stuckrath



Plat 231724-14004
" 14005
" 41002
" 41003
" 43002
" 48003
" 44002

Page 1 of 1

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SH DEIS—006
RECEIPT DATE: FEB 26 2002

Kuehn, Ginny -KC-7

From: Driessen, Laurens C - TNP-TPP-3
Sent: Monday, February 25, 2002 2:09 PM
To: Kuehn, Ginny -KC-7; Wittpenn, Nancy A - KEC-4; Ellis, Liz M - KEC-4
Subject: FW: schultz-hanford trans. line project

-----Original Message-----
From: Richard Ambrose [mailto:cabin@kvalley.com]
Sent: Friday, February 15, 2002 9:35 AM
To: lcdriessen@bpa.gov
Subject: schultz-hanford trans. line project

Good morning Mr. Driessen,

Thank you to your agency for promptly sending out a copy of the DEIS on the Schultz - Hanford project.
6-1 We live up in Cooke Canyon and I have contacted you before in 2001. We have all seen the survey markers that are running parallel to the existing line and knew this as proposed alternative A. My question is: Has this route changed because of the rather large cultural area near Coleman creek? Map between pg.3-94 and 3-95 shows this whole area to be sensitive. (Parke Cr. to Coleman Cr.) Being 5th generation in this valley, I am aware of this part of the valley, particularly where Cooke and Caribou creeks come down, as being a "council ground" on the main north-south travel route.
I only found one sentence referring to a change in the line position and it wasn't clear.
6-2 The report is very impressive! Very educational ! I appreciate all the work in completing this statement.
Thanks for your time.

Sincerely,
Katie Ambrose

2/26/02

Public Comments

Wallace M. Stampfly
2453 Charlton Road
Ellensburg, WA 98926
Jan. 14, 2001

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-007
RECEIPT DATE:
FEB 2 6 2002

Schultz-Hanford Transmission Line Project

1. When you develop alternative routes please consider:

7-1 Some of us already have large transmission towers passing through our property. In approximately 1965 BPA constructed a power line through a portion of my property on Sec. 27, 28, Range 19, Township 19. It is the only line that BPA constructed of its type. It looses the most electricity of any of the lines which come through the north foothills of the Kittitas Valley. This line is harmful to people and the environment because of power loss. One can actually get a light shock from barbed wire fences close to the lines. These lines are very noisy when it is raining and snowing. As you are probably aware, they glow at night when they are wet.

Since I already have one large line through my property, I would prefer not to have another one. Because of power loss questions as mentioned above, I question their safety for both animals and people. I do not feel it is safe to have so many large power loosing lines located so closely together.

7-2 If one is to be built, I would prefer it to be on the north side of the existing structures. Please consider whether lines can be consolidated with existing towers.

7-3 Every year I have inquiries about purchasing some of my land. These high power transmission lines take away from the value of the land. People do not want to be located close to them. What provisions do you have to make up for the devaluation of our property value due to your construction? I am from a third generation family on this livestock ranch, so I am very concerned about keeping the land in productive and safe condition.

Sincerely yours,

Wallace M. Stampfly 2/11/02

Wallace M. Stampfly

Kuehn, Ginny -KC-7

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-008
RECEIPT DATE:
FEB 2 6 2002

From:	Campbell, Paula J - TRF/Bell-1
Sent:	Friday, February 22, 2002 2:42 PM
To:	Ellis, Liz M - KEC-4
Cc:	Driessen, Laurens C - TNP-TPP-3; Rapozo, Sandra M - TRF/Bell-1; Rosales, Mari - TRF/Bell-1; Wittpenn, Nancy A - KEC-4; Tyson, Ivy L - TNLC-TPP-3; Kuehn, Ginny -KC-7
Subject:	FW: TRF/Bell-1

Here's one vote to keep the preferred route north of the existing line. -pjc

-----Original Message-----
From: Wolters, Eric USAEC
[mailto:Eric.Wolters@daapgea050.apgea.army.mil]
Sent: Wednesday, February 20, 2002 4:32 AM
To: 'Campbell, Paula BPA'
Subject: TRF/Bell-1

8-1 Ms. Campbell, thank you for your letter and the map that you forwarded. I appreciate the time you took to respond in such a thorough manner. Based on what I remember of the topography and the area through which the proposed line will pass, it seems as though the preferred route is a very good choice.

8-2 In any event, I would urge you to keep it to the north of the existing line. Thanks for the opportunity to comment. Eric Wolters

1

Public Comments

BONNEVILLE POWER ADMINISTRATION

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PUBLIC INVOLVEMENT
LOG#: SHDEIS-009
RECEIPT DATE:
MAR 0 5 2002

Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement

Comment Form

9-1 1. What are your comments on the Preferred Alternative? I believe this will be the easy route to go, as there are limited land owners to deal with. Also since quite a bit of land is in B.P.A. transmission lines, less proble

9-2 2. What are your comments on other alternatives? The route thru the Army Range will not do, as it would interfere with their firing missles, large rockets, and their actions, quite often at night.

3. I need more information about

9-3 4. Additional comments most people don't like transmission lines in their so called back yards, but don't realize the growth in this state, and the need of most power. We who are on a ranch know how important electric power can be. too many people want us to go back to the buffalo days, not this person.

☐ Please put me on your project mailing list. (You are already on the mail list if you have received mailed notice.)

☐ Please remove me from the project mailing list.

Name: VICTOR E ROBERT

Address: 9 So 55th Ave, Yakima, Wa 98908

Please send comments by March 25, 2002 to:

Bonneville Power Administration
Public Affairs Office - KC
P.O. Box 12999
Portland, OR 97212

Benton County Office of Sustainable Development

1788 Fowler Street
Richland, Washington 99352

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-010
RECEIPT DATE:
MAR 0 6 2002

1 March 2002

Bonneville Power Administration
Public Affairs Office – KC-7
Post Office Box 12999
Portland, Oregon 97212

Re: Comments pertaining to the Schultz-Hanford Project DEIS

Dear Sir:

Thank you for the opportunity to comment on the *Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement* (Schultz-Hanford) – significant portions of which occur within Benton County. We have several questions/comments to provide, some relating to the document itself and others to the project in general.

Some of our thoughts regarding the Schultz-Hanford project:

10-1
- While Benton County recognizes the need for this infrastructure, we are also aware of the impacts that transmission lines have on various resources. The best way to lessen impacts is to have as little new encroachment and construction as possible. When comparing the alternatives, it appears that this is the case with the Preferred Alternative. There are some unanswered or unclear points however:

10-2
  - Is there a need for a completely new substation at Wautoma? Is there instead any opportunity to team with Benton REA, and cooperatively use – through expansion and upgrade – the existing facility at Blackrock?

10-3
  - "Double circuit" infrastructure is being suggested for some areas, while parallel single circuit routing is recommended for others. Why is this? The double circuit system would appear to require less right-of-way and fewer structures, hence, less visual and habitat impacts.

10-4
- We are particularly concerned with wildfire and weed issues in Benton County. Wildfire is a constant threat to public safety and property, and weed infestation is a growing silent epidemic with significant impacts to agriculture, native habitats, and cultural heritage.
  - There need to be fire and weed control plans associated with this project. Given that BPA has many miles of transmission lines throughout the arid Northwest, we assume that the agency has some experience in this area. Nonetheless, both construction and maintenance vehicle traffic present numerous and permanent opportunities for inflammation and for invasive plants to colonize remote areas and gain footholds. We suggest that BPA remediate in disturbed areas after construction by repatriating native plant species and educating staff in fire/weed reduction practices and techniques.

Public Comments

10-5 • There has been no extensive discussion of mitigation for habitat disturbance that we are aware of. All of the "action alternatives" will impact the already fragile, fragmented, and diminishing shrub-steppe ecosystem of the Columbia Basin. BPA should make an effort to recover these losses in other areas near the project. One possibility that BPA is aware of is the proposal to purchase the "McWhorter Ranch" property adjacent to the Hanford Reach National Monument. This proposal was made to BPA as part of the "Columbia Plateau" provincial review, but has so far been declined due to expense. Benton County is on record supporting this purchase, and we would again urge BPA to work with other involved parties to acquire this asset, including: Northwest Power Planning Council, Washington Department of Fish and Wildlife, and the Rocky Mountain Elk Foundation. This purchase would secure several thousand acres of well-managed shrub-steppe and rangeland for use as open space, recreation, and habitat restoration.

10-6 We also have two brief comments regarding the DEIS itself. First, that no maps appear in the summary document, even though maps are referenced several times and the alternatives are described in such fashion that maps are required for understanding. Some reviewers may only have the summary document and are therefore unable to have any visual context or references.
10-7 Second, some of the maps that are included in the full document incorrectly label the "Hanford Monument" and do not graphically differentiate between the core Hanford Site and the Hanford Reach National Monument. This is an important distinction.

Again, thank you for the opportunity to comment on this project.

Sincerely,

Adam J. Fyall
Hanford Coordinator

cc: Greg Hughes, Project Leader, Hanford Reach National Monument
Jeff Tayer, Regional Director, Washington Department of Fish and Wildlife

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From: Cyndy and Art Kuebel
1321 Thomas Road, Ellensburg, WA 98926 509-925-9443
February 28, 2002
Regarding: The Shultz-Hanford Area Transmission Line Project

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHAEIS-011
RECEIPT
MAR 0 6 2002

To: Bonneville Power Administration

11-1 We recently reviewed the draft E.I.S. for the proposed transmission line project, and were greatly impressed by the extent of the draft E.I.S.. We live within three miles of the Segment A Naneum-Wilson Creek crossings. We agree with the choice of the Preferred Alternative, but would like to see the following five points addressed, or addressed more completely, or changed in the final E.I.S..

11-2 1) Table 2.8-1 (Summary of Impacts), pg. 2-22 it is stated that "Trees may be removed in four riparian areas." We request that trees not be removed in these areas. The large cottonwoods in the riparian areas along the north edge of the Kittitas Valley are extremely important to wildlife, and are the trees of choice for roosting eagles and a number of hawk species. During the late winter we see a large number of raptors leaving these riparian areas every morning to disperse into the Kittitas Valley for the day. These large trees also help to stabilize water temperature, and control spring flooding; the more conscientious downstream farmers have for years attempted to keep their riparian forests intact for these very reasons.

11-3 2) We are concerned about the impacts to the vegetation (and therefore wildlife habitat) in both the riparian and shrub-steppe communities. This impact will not just be from BPA's line construction, but from public use of the maintenance roads after the line is constructed. People in four-wheel-drive vehicles frequently use dirt roads as launching points for off-road assaults. It would probably be impossible to keep people off of a new road if it is close to an existing road, unless both roads are gated. Please consider gating all maintenance roads in the Naneum-Wilson Creek areas, and in any of the more pristine shrub-steppe communities along the length of all segments. Alternatively, sign existing and new roads for no off-road use, and include some kind of fine system for those caught off-road.

11-4 3) Water fords should be avoided, unless the roads are not accessible to the public (see above). We are not concerned with occasional BPA use, but are worried the public will use the roads to go "mudding" in accessible creeks and wetlands.

11-5 4) Conduct complete ground Threatened & Endangered plant surveys along the length of at least Segment A (summarized as the most pristine), and in other areas most likely to harbor T & E species. This would enable BPA to avoid or mitigate for T & E plant species along the route, potentially lessening the "moderate impact" listed in Table 2.8-1 (Summary of Impacts), pg. 2-24.

11-6 5) The spread of noxious weeds is a huge concern to us. Noxious weed spread into uninvaded areas via new access roads and increased traffic can undo attempts by BPA to lessen environmental impacts along the segments; BPA already has a significant weed problem along some/all of its existing access roads. We recognize that agriculture is a significant source for many of these weeds, so we encourage BPA to work very closely with the counties to finally provide the significant weed control that is currently lacking.

Thank you for the opportunity to make our voices heard.

Cyndy Kuebel Art Kuebel

11-7 Please make your botanist aware of the fact that I have found a total of 3 Iliamna longisepala plants both above + below the proposed Naneum Creek crossing that may not have been picked up by the [illegible] Thank you. Cyndy Kuebel

Public Comments

B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-012
RECEIPT DATE:
MAR 1 3 2002

Comment Form

12-1 1. What are your comments on the Preferred Alternative? Initially I favored another alternative, but after attending the public meeting in Ellensburg on Feb. 26 I feel confident that the preferred alternative is the correct choice.

12-2 2. What are your comments on other alternatives? I initially favored a more direct and shorter route through the firing center but did not consider the towers would become obstacles for aircraft.

3. I need more information about

4. Additional comments

☐ Please put me on your project mailing list. (You are already on the mail list if you have received mailed notice.)

☐ Please remove me from the project mailing list.

Name WM. H. OR M. L. ADAMS
Address 2002 DRY CREEK RD.
ELLENSBURG, WA 98926

...nts by March 25, 2002 to:

Bonneville Power Administration
Public Affairs Office - KC
P.O. Box 12999
Portland, OR 97212

WASHINGTON STATE DEPARTMENT OF
Natural Resources

DOUG SUTHERLAND
Commissioner of Public Lands

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-013
RECEIPT DATE:
MAR 1 9 2002

March 15, 2002

Lou Driessen
Project Manager
Department of Energy
Bonneville Power Administration
Communications-KC-7
PO Box 12999
Portland, OR 97212

RE: TNN-TPP-3; SCHULTZ-HANFORD AREA TRANSMISSION LINE PROJECT.

Dear Mr. Driessen:

13-1 Thank you for the opportunity to comment on the Schultz - Hanford Area Transmission Line Project. The Washington State Department of Natural Resources (DNR) is the managing agency of those state Trust land parcels that would be impacted by the proposed project. As a result of our review, we recommend Route 3, the only route offered that has no impact to the state trust lands. However, we could support your preferred alternative, Route 2. Aside from Route 3, Route 2 has the least physical impact to the trust lands potentially impacted of the remaining three routes presented. We do not support Routes 1 or 1A.

13-2 If Route 2 is selected, then the following are specific comments and a specific request: Route 2 only impacts DNR land in Section 31, Township 15 North, Range 24 East. It is our understanding that BPA's plans for the parcel are to go vertical with another 550 KVA line on the existing towers. Apparently this will require an additional 25 feet to the west side of the existing 100 foot right of way but not change the existing footprint of the towers.

BPA folks at the February 26 public meeting indicated that the new towers could be shifted from their current locations. If this is indeed the case, then this letter is DNR's request that Bonneville move the two towers on the edge of the circle located in the SE4 further out of the circle boundary to make farming more efficient, i.e., furtherance of unobstructed farming. We understand the tower within the circle in the SE4 must remain; the present tower in the NW4 will also remain at its present location. We understand the only impact will be the lessee in the NW4 being required to remove several rows of grapes to allow access to the tower in the current right of way. Our lessee knows this will happen after the 2002 crop is harvested if, indeed, Route 2 is selected.

13-3 Once a decision is rendered and if it does not include Route 3, I suspect we'll need to sit down and discuss the effects of any expansion of the right of way that will be needed and the process by which we'll address any footage increase in the current right of way path.

SOUTHEAST REGION ▮ 713 BOWERS RD ▮ ELLENSBURG, WA 98926-9301
FAX: (509) 925-8522 ▮ TTY: (509) 925-8527 ▮ TEL: (509) 925-8510
Equal Opportunity/Affirmative Action Employer

RECYCLED PAPER

Public Comments

These are our comments for now. Again, we do appreciate you for giving us the opportunity to comment and hope you will incorporate them into your final decision. Please keep us posted on the project as you proceed.

Sincerely,

Dick Wedin
Growth Management Coordinator
Southeast Region

DW:ch

c: Bert Moon, DNR
Duane Unland, DNR
Milt Johnston, DNR
Linda Hazlett, DNR
Steve Wetzel, DNR

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RECEIPT DATE:
MAR 19 2002

CENTRAL WASHINGTON UNIVERSITY
ELLENSBURG • LYNNWOOD • MOSES LAKE • SEATAC • STEILACOOM • WENATCHEE • YAKIMA
DEPARTMENT OF GEOGRAPHY AND LAND STUDIES

March 16, 2002

To: Bonneville Power Administration
Communications—KC7
P.O. Box 12999
Portland, Oregon 97212

I am writing specifically about one particular area in Segment A of the Schultz-Hanford Area Transmission Line Project. That area is roughly encompassed by Map # 3 of your Draft Environmental Impact Statement.

14-1

As Appendix H correctly points out:

> Significant cultural resources are categorized as historic and archaeological properties, properties of traditional and cultural significance, sacred sites, and cultural landscapes, which are all recognized and protected under federal mandates (Appendix H, page 8).

I wish to inform you that your proposed reroute lies in an area that very likely contains all of the above. Rerouting of this corridor will require intensive field and archival research and the evaluations of significance will require assessment not only of the subject properties but the development of the ecological and cultural context for those evaluations. For example the proposed reroute obviously crosses through distributions of historic artifacts associated with early agricultural settlement of the valley and the distributaries of Cooke Creek are direct expressions of the emergent irrigated agricultural systems in the Kittitas Valley. Their significance, under the National Registrar of Historic Places, will require the development of extensive documentation at the landscape and place spatial scale of these culturally important historic features.

The mouths of canyon systems like Cooke and Coleman creeks are marked by extensive alluvial fan deposits. These fan systems are dynamic and characterized by shifting channel patterns through time. The resulting landscape is one of a complex interface of riparian and shrub-steppe habitats. Sullivan (2000) gives a detailed reconstruction of this complex mosaic prior to major alteration by agriculturally based human systems and is the most complete evaluation of the landscape that supported the encampment observed by Alexander Ross. This encampment includes the areas of the proposed reroute:

400 E. 8th Avenue • Ellensburg WA 98926-7420 • Lind Hall 119 • 509-963-1188 • FAX: 509-963-1047

Public Comments

Ross's Observations in the Kittitas Valley, 1814

> At that place all the Indians were rich in horses; the Cayouses, Nex Perces, and other warlike tribes assemble every spring to lay in a stock of the Favourite kamass and pelica, or sweet potatoes, held in high estimation as articles of Food among the natives. Here also the Indians hold their councils and settle the affairs of peace and war for the year; it is therefore, the great national rendezvous, when thousands meet and on such occasions horses can be got in almost any numbers, but owing to the vast concourse of mixed tribes, there is always more or less risk attending the undertaking.
> . . . we entered the Eyakema Valley, "the beautiful Eyakema Valley," so called by the whites. But on the present occasion there was nothing either beautiful or interesting to us; for we had scarcely advanced three miles when a camp in the true Maleluke style presented itself. A camp of which we could see its beginning but not the end! This mammoth camp could not have contained less than 3,000 men, exclusive of women and children, and treble that number of horses. It was a grand and imposing sight in the wilderness, covering more than six miles in every direction. Councils, root gathering, hunting, drumming yelling, and a thousand other things which I cannot mention were going on . . . the din of men, the noise of women, the screaming of children, the tramping of horses, and howling of dogs was more than can well be described. (Spaulding, 1956)

The camp Ross saw in the early 1800's reflected the regional economic and social importance of the Kittitas Valley to the native people. It reflects a time when native peoples and goods moved from the Coast to the eastern Rockies through a complex network of social and economic relationships. The camas roots from the meadows of the Kittitas Valley, the desert roots from the foothills, the horses, manufactured products, and other resources from Kittitas region found their way to the winter hearth and home of native people throughout the Columbia River Basin. The land the pioneer cattleman and farmers saw as open, awaiting beast and plow, was already settled. It had been settled for thousands of years.

14-2 Other historical accounts and oral histories amplify the former importance of anadromous fish in these streams and the archaeological deposits existing in this area are significant for the ecological and cultural information may they contain. It is extremely likely that buried archaeological places exist in the proposed reroute and substantial surface and sub-surface evaluations will be required.

14-3 Of particular significance both culturally and ecologically are the spring systems that exist in the area of the proposed reroute. These springs are long-lived features in this landscape and many provide water at low flow. The placement of towers across this alluvial fan system has the very real potential to directly impact the preferential flow

14-3 cont. paths of this complex system. Because numerous springs emerge immediately south of the proposed reroute extensive modeling of subsurface preferential flow paths through this fan systems will be required prior to the construction of towers in the proposed reroute.

14-4 The Draft EIS is a vague description of the proposed route and primarily based on existing information. It is clear from reading both the EIS and the references that the spatial scale of the information contained is not sufficient to assess the specific details, and in some cases even the general nature of the cultural and ecological impacts from the proposed routes. In the case of the proposed reroute detailed field based, archaeological, ethno-historical, and biophysical research will be required to determine the potential impacts.

Thank you for the opportunity to comment.

Always,

Professor Morris L. Uebelacker

Sullivan, Allan, E. 2000. The Expected Potential native Vegetation of the Kittitas Valley, Central Washington: A soils Based Approach to the Reconstruction of Vegetation Landscapes. Ph.D. Dissertation, Oregon State University. Corvallis, Oregon.

Spaulding, K.A. (ed.)
1956 Fur Hunters of the Far West: Alexander Ross's Narrative, (reprint of 1855 edition). Norman, Oklahoma: University of Oklahoma Press.

Public Comments

PLANNING DEPARTMENT

128 North Second Street • Room 417 • Courthouse • Yakima, Washington 98901
(509) 574-2230 • 1-800-572-7354 • FAX (509) 574-2231 • http://www.co.yakima.wa.us

RICHARD F. ANDERWALD, AICP, DIRECTOR OF PLANNING / SPECIAL PROJECTS — STEVEN M. ERICKSON, ASSISTANT DIRECTOR

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-015
RECEIPT DATE:
MAR 21 2002

March 16, 2002

BPA
Communications – KC-7
P.O. Box 12999
Portland, OR 97212

RE: Comments on Shultz-Hanford Transmission Line – (TNN-TPP-3) (DOE/EIS-0325)

Dear Sirs:

Thank you for the opportunity to review the Draft Environmental Impact Statement for this project.

15-1 Yakima County normally has jurisdiction over land use and critical areas within the County. An exception to this is projects on federal land. I do not know if the right-of-way for the transmission line will be federally owned or if it will be owned by a private company/utility. If it will be privately owned, permits will be required.

15-2 Most linear uses such as power lines, utilities, and roads do not require land use review. However, many linear projects, such as this transmission line, encounter critical areas. Critical areas along this project include larger and smaller Type 5 streams. If the project is non-federal and will require work across a stream or wetland, the project will need Critical Area Permit review. In addition, accessory facilities (such as substations, monitoring buildings or similar above ground structures) require zoning review.

15-3 The comments below are general in nature, and relate to streams and wetlands. They would apply to all segments equally, in addition to Segment C in Yakima County. Roads often directly follow transmission lines. If such is the case for this project, the roads will cross many large and small streams and/or wetlands. Stream crossings should use at-grade fords for intermittent (Type 5) streams, since that is the least impact/least cost/least maintenance options. Crossings for perennial streams should use existing crossings (State or County bridges) rather than creating new ones. Roads should be diverted around wetlands. Towers and work areas should be placed in upland areas rather than within the critical areas or buffers.

Again, thank you for the opportunity to comment on this project. If you have any questions, feel free to call me at 574-2230

Sincerely,

Dean Patterson

DEAN PATTERSON
Zoning and Environmental Manager

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"OUR MISSION: TO HELP OUR COMMUNITY DEFINE AND ACHIEVE ITS PREFERRED FUTURE"

State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Region 3 Office: 1701 South 24th Street - Yakima, Washington 98902-5720 - (509) 575-2740

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-016
RECEIPT DATE:
MAR 22 2002

March 21, 2002

Department of Energy
Public Affair Officer - KC -7
ATTENTION: Lou Dreissen
P.O. Box 12999
Portland, OR 97212

Dear Mr Dreissen:

SUBJECT: NEPA -Draft Environmental Impact Statement - Schultz-Hanford Area Transmission Line Project; Bonneville Power Administration, Construct Transmission Line and associated access roads and water crossing structures, Yakima, Grant, Benton, and Kittitas Counties, WRIA's 37, 39, 40

The Washington Department of Fish and Wildlife (WDFW) has reviewed the above-referenced National Environmental Policy Act (NEPA) document received on March 8, 2002, and offers the following comments at this time. Other comments may be offered as the project progresses.

16-1 We continue to support Alternative 2, which has been selected as the preferred alternative in the Draft Environmental Impact Statement (DEIS). The DEIS provides a thorough review of the affected environment and environmental consequences of this project. In addition, the mitigation recommendations provided and the incorporation of our previous comments in the DEIS have addressed many of our previous concerns regarding potential project impacts. However, due to that lack of site specific details with regard to the locations and methods to be used to implement the project, such as the locations and methods used for water crossing structures, some concerns regarding the project remain.

16-2 It also appears that there are alternatives available which could further reduce some of the identified environmental impacts. Double circuit towers are only proposed within the eight mile area consisting of agriculture near Mattawa. While these taller 170 foot tower could not likely be used on the Yakima Training Center, we don't understand why they cannot be used on the remaining portions of the project. Use of double-circuiting would avoid the need for two separate sets of towers and the associated loss of habitat.

Fish Resource Impacts

Public Comments

Lou Dreissen, BPA
March 21, 2002
Page 2

16-3 The DEIS indicates that there will be several stream crossings associated with both new and improved access roads proposed throughout the project. Hydraulic Project Approvals will be required for installation and maintenance of all proposed water crossing structures. There is insufficient information in the DEIS to determine if additional mitigation will be necessary for these projects, especially with regard to the 10 fish bearing streams which will be crossed by access roads..

16-4 We concur with the recommended mitigation measures within the DEIS that all towers be placed at least 200 feet from the ordinary high water line of fish bearing streams. We also support the use of existing water crossing structures whenever possible to avoid the need for new structures. The recommended application of BMP's within the DEIS for road construction and maintenance should be implemented to avoid sedimentation of fish bearing waters.

Permitting

16-5 It appears from the general description of the project, that a Hydraulic Project Approval (HPA; Chapter 77.55 RCW, WAC 220-110) to be issued by WDFW, will be required for the project.

16-6 There is, however, insufficient project detail to determine specific conditions or mitigation to be placed on the project at this stage of the project development. We encourage you to seek involvement from WDFW on resource needs and typical project requirements to insure proper protection of fish life as you proceed with project design and development. Early involvement with WDFW will facilitate later processing of the HPA. Once final design plans are available, please submit a completed Joint Aquatic Resource Permits Application (JARPA) for an HPA, including complete plans and specifications, to WDFW for review.

16-7 The plans and specifications should be developed relative to the ordinary high water line. The drawings should accurately depict existing conditions including all prominent natural features and manmade improvements in the water and on the bank in the immediate vicinity of the project area. They should include plan and cross-sectional views of the proposed project, a vicinity map of the project area, and accurate directions to the project site. In addition, to aid us in locating the project site, a photograph should be supplied.

JARPA forms are available from WDFW or most local government permit offices. You should allow 45 days from the receipt of a complete application and written notice of compliance with the SEPA process for processing of the HPA.

Wetland Impacts

16-8 Although the DEIS identifies wetlands within the project route, there appears to be insufficient information to determine to what extent they will be affected by the project. The proposed access roads and other associated structures should be located to avoid impacts to these wetlands. In instances where structures must be placed within or near wetlands, delineations should be completed to determine mitigation requirements.

Lou Dreissen, BPA
March 21, 2002
Page 3

Unmitigated Impacts

16-9 While the DEIS identifies the Environmental Consequences and provides means to avoid most of the potential environmental risks associated with the proposed project, it also itemizes impacts which cannot be avoided. We concur with the findings of Section 4.15 on page 4-120 identifying the "Adverse Impacts that Cannot be Avoided", and that the project will contribute to an increased level of habitat fragmentation and a reduction in available shrub-steppe vegetation for wildlife habitat.

16-10 Unmitigated impacts include the area of habitat which will be lost through construction of roads, improved roads, pulling and reeling, staging areas, substations, water crossing structures, riparian corridors, and well as other cumulative impacts. While it is relatively easy to total the acreage of impacts habitat, cumulative impacts and disturbance associated with the projects is more difficult to assess.

16-11 Section 2.7 of the DEIS indicates that the road disturbance associated with the preferred alternative with result in 340.7 acres of habitat disturbance. Section 4.5 indicates that the tower pads will result in the loss of 71.7 acres, and Section 2.9 indicates that and additional 25 acres of shrub-steppe will be lost to substation installation. This appears to indicate that 437.4 acres of shrub-steppe habitat would be lost through implementation of the preferred alternative, not including impacts associated with wetlands and equipment staging areas.

Table 4.1-1 on page 4-5 indicates that the access roads and towers in the preferred alternative will result in disturbance of 411.8 acres. However, it is not clear if the additional shrub-steppe impacts associated with improving and widening existing roads are included in this calculation. It is also assumed that this does not include substations, pulling and reeling areas, and staging areas, or the additional five acres of forested habitat, which the DEIS indicates will also be lost.

It appears that the total direct loss of shrub-steppe habitat will be between 400 and 500 acres. Direct loss may be reduced if restoration and revegetation work is implemented in the project corridor. Additional impacts to fish and wildlife which are likely to result from implementation of the preferred alternative include, the lineal distribution of noxious weeds, birds strikes, some loss of ecological connectivity due to habitat fragmentation.

WDFW's mitigation policy is to seek greater than 1:1 mitigation ratios for impacts or direct loss of fish and wildlife habitat. Three to one (3:1) ratios are typically used. A 3:1 to 5:1 mitigation ratio is valid for shrub-steppe due to: 1) difficultly in restoring habitats in arid environments; 2) length of time to restore a climax community (20-30+ years for sagebrush); 3) fragmentation impacts beyond those of direct habitat lost by roads, towers etc (e.g. transmission line built through remnant block of shrub-steppe reduces the ecological connectivity and functionality of the whole block even though most habitat is not directly disturbed.

With consideration of expected cumulative impacts it appears that the preferred alternative will conservatively require acquisition or protection of a minimum of 1200 to 1500 acres of shrub-steppe habitat to mitigate for impacts which cannot be avoided.

Public Comments

Lou Dreissen, BPA
March 21, 2002
Page 4

16-11 cont.

It is difficult to evaluate impacts and develop suitable mitigation through a piecemeal approach whereby each project is considered individually and not in context with all BPA's proposals in south central and south eastern Washington. Independent biological assessments of the environmental impacts of multiple projects in shrub-steppe habitat often does not fully assess the combined cumulative effects on the landscape.

It is assumed that the other proposed projects associated with wind power, transmissions lines, substations, and gas turbine power plants identified in the DEIS, will also require some mitigation. We strongly advocate the development of a comprehensive mitigation banking plan which consolidates necessary mitigation for all proposed projects. Scientific literature indicates that shrub-steppe habitat owes a great deal of its functionality to large, contiguous blocks, and mitigation banking is a valid means of mitigating for loss of shrub-steppe vegetation. Mitigation from each proposed project could be banked to secure large blocks of relatively intact shrub-steppe habitat. The mitigation banking effort could be coordinated through BPA's existing Fish and Wildlife programs.

Thank you for the opportunity to provide these comments. We look forward to meeting with you regarding mitigation opportunities and development of a comprehensive mitigation plan. If you have any questions, please contact me at (509) 457-9314.

Sincerely,

Ted A. Clausing
Regional Habitat Program Manager

cc: Peter Birch, Deputy Assistant Director, Habitat
Jeff Tayer, Regional Director, Region 3
Cynthia Pratt, SEPA Coordinator, WDFW
Perry Harvester, Habitat Biologist
Lee Stream, RWPM, Region 3
Brent Renfrow, AHB, Ellensburg
Don Larsen, AWB, Pasco

Kuehn, Ginny -KC-7

From: Theodore Clausing [CLAUSTAC@dfw.wa.gov]
Sent: Friday, March 22, 2002 8:41 AM
To: comment@bpa.gov
Subject: WDFW comments on the Schultz-Hanford DEIS

Washington Department of Fish and Wildlife comments regarding the Schultz-Hanford Transmission Line Project DEIS are attached. A hard copy of the letter was also mailed yesterday, but may not arrive by March 25th. Thank you for the opportunity to provide these comments.

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Public Comments

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Bonneville Power Administration
Communications – KC-7
P.O. Box 12999
Portland, OR 97212

Re: Schultz-Hanford Area Transmission Line Project – DOE/EIS 0325
Comments on Draft Environmental Impact Statement

Dear Sir or Madam:

This law firm represents Cooke Coleman LLC and its manager and sole member, Gaylord Kellogg, the owner of certain real property referred to as the "Kellogg Family Ranch" affected by the proposed construction of a new 500-kilovolt (kV) transmission line in central Washington State (the "Proposal") by the Bonneville Power Administration ("BPA"). BPA has purported to study potential environmental impacts of the Proposal in a draft Environmental Impact Statement ("DEIS"), published in February 2002. A portion of the new transmission line has been proposed along a possible reroute of Segment A (the "Reroute"), which proposal also includes removal and reconstruction of an existing transmission line alongside the new transmission line. Both lines along the Reroute would cross approximately .6 of a mile of the Kellogg Family Ranch. This letter constitutes the formal comments of Cooke Coleman LLC and Gaylord Kellogg on the DEIS.

In the Reroute alternative for the Proposal, the BPA is proposing construction of two lines across privately-owned land, portions of which Mr. Kellogg has been exploring as to the feasibility of restoring to its natural native state, including areas directly under and adjoining the proposed Reroute. Mr. Kellogg's stewardship of the entirety of the Kellogg Family Ranch is placed in jeopardy as a result of the Reroute. In preparing the DEIS, BPA did not consult with or even give prior notice of the Reroute to Mr. Kellogg. Further, BPA erroneously assumed – without analysis -- in the DEIS that impacts resulting from construction of two new lines along a longer, circuitous route (including removal of the existing line along the current straight route) would be the same as impacts resulting from only a single line along a shorter route next to the existing line. As detailed below, we urge BPA to address the procedural and substantive deficiencies that

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have occurred in preparing the DEIS, including but not limited to, preparation of a draft supplemental environmental impact statement analyzing the Reroute alternative.

A. <u>The Scoping Process for the DEIS Was Deficient.</u>

17-1

1. <u>No Notice of Reroute Alternative Prior to Publication of DEIS.</u>

This 45-day public comment period is the first opportunity Mr. Kellogg has had to review and submit comments on the Reroute alternative which calls for construction of two transmission lines traversing the Kellogg Family Ranch. *See* Attachments 1-5. The Reroute was not indicated on any of the four scoping notices issued by BPA, beginning in December 2000. *See* Appendix A of the DEIS. In fact, although BPA has been conducting planning for the Proposal for more than a year, there has been no public notice or opportunity to comment regarding the Reroute alternative until publication of the DEIS last month. Mr. Kellogg first learned of the Reroute on February 7, 2002 – the day before the DEIS was published – and did not receive any visual indication of the Reroute until February 11, 2002. *See* Attachment 8. Only at that point did Mr. Kellogg learn of the possible Reroute, which will directly and substantially impact the Kellogg Family Ranch. Documents received from the BPA pursuant to a recent FOIA request indicate that plans for the Reroute were being developed as early as October 2001. *See* Attachment 15.

The last-minute inclusion of the Reroute in the DEIS process was not preceded by any public notice or opportunity for public involvement, contrary to NEPA procedural requirements. In fact, one of BPA's own public brochures, entitled "A Handy Guide to Meeting Bonneville's Environmental Requirements Before the Funding of Your Project," states the following on page 5:

> Public involvement is an important Bonneville commitment, both to the citizens of the Pacific Northwest and to the provisions of NEPA. **It's also common sense: if you take an action that affects people, and you don't talk with them first to see what they think, you are more likely to get resistance and anger.** Bonneville's main concern is that the "interested or affected public" be notified and allowed to comment on specific projects before Bonneville makes a final decision to fund them.

Attachment 20 (emphasis added). The DEIS states on pages 1-3 through 1-4:

> Scoping refers to a time early in a project when the public has an opportunity to express which issues and concerns should be considered in an EIS. On November 9, 2000, BPA published a Notice of Intent to prepare an EIS and conduct public scoping meetings for the proposed project. A letter was sent to the public on December 12, 2000, explaining the proposal, the environmental process, and how to participate. A comment sheet was included to enable individuals to mail comments back to BPA. An e-mail address was also given to enable people to

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comment by e-mail. Project scoping meetings were held in Desert Aire, Yakima, and Ellensburg, Washington. Written and verbal comments were collected during scoping.

A second project mailing went to the public on March 26, 2001. This letter updated interested parties on the progress of the project and the information gathered during the scoping process. Many issues were raised during the scoping process, and most of the comments received focused on the following issues:

- Potential environmental impacts, including impacts to residential land and property values;
- The proposed alternatives and how the line would be designed;
- Agricultural land impacts; and
- The need for the project, and the agencies that BPA should coordinate with during the process.

* * *

On June 6, 2001, a third letter was mailed to landowners along a new route located in the Saddle Mountain area east of Vantage. Members of the public who attended the scoping meetings proposed a route in this general area. BPA personnel took a closer look and developed a route, which is discussed in the next chapter.

A fourth letter was mailed on July 30, 2001. This letter identified BPA's Preferred Alternative and the reasoning behind the choice.

Notwithstanding the fact that the Reroute will run across the Kellogg Family Ranch, BPA did not consult with or even give prior notice of the Reroute to Mr. Kellogg.[1] Unlike the landowners along the "new route" located in the Saddle Mountain area referenced above, BPA never sent out a letter to Cooke Coleman LLC or Mr. Kellogg inviting comment on the Reroute. The July 30, 2001 letter describing the Preferred Alternative is also silent regarding the Reroute.

17-2

2. NEPA Provides for Public Participation During Scoping.

Public participation is a hallmark of NEPA and a vital element in accomplishing the statute's disclosure purposes. *E.g.*, 40 C.F.R. § 1500.1(b) (stating that public scrutiny is essential to

[1] Even after publication of the DEIS, BPA made it difficult to provide public comment. BPA's website indicated that public meetings would be held regarding the DEIS, but failed to indicate a precise location for the first meeting, held on February 26, 2002; no address for the Hal Holmes Community Center in Ellensburg was provided. *See* Attachment 7.

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implementing NEPA); 40 C.F.R. § 1500.2 (requiring agencies to the fullest extent possible to implement procedures to make the NEPA process more useful to decision makers and the public, and to encourage and facilitate public involvement in decisions which affect the quality of the human environment); *see Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (holding that one of the twin aims of NEPA is active public involvement and access to information); *Trout Unlimited v. Morton*, 509 F.2d 1276, 1283 (9th Cir. 1974) (holding that NEPA requires provision of information of the proposed project's environmental impact and encouragement of public participation in the development of that information). The lead agency is required to make "diligent efforts to involve the public in preparing and implementing their NEPA procedures." 40 C.F.R. § 1506.6. Such public participation is provided through the scoping process and through the ability to provide comments on the environmental impact statement.

Prior to preparation of a DEIS, the lead agency must consult with and obtain comments from the public and other federal agencies. 42 U.S.C. § 4332(2)(c). The scoping process is detailed in 40 C.F.R. § 1501.7, and is intended to provide an "early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." In this process, the lead agency is required to invite the participation of affected persons and to hold scoping meetings where the impacts of a particular action are confined to specific sites. 40 C.F.R. § 1501.7(a), (b). The scoping process is vitally important because, as set forth in 40 C.F.R. § 1502.9(a), draft environmental impact statements "shall be prepared in accordance with the scope decided upon in the scoping process."

The scoping process is particularly critical here because BPA's decision on the Proposal is not subject to formal adjudications under the Administrative Procedures Act ("APA"), and thus is not subject to APA procedures for public notice, comment and hearings. *See* 5 U.S.C. § § 551-706 (1994); *see also* 16 U.S.C. § § 832, *et seq.* Given the significant impact of the Proposal on individual property interests, due process requires that Cooke Coleman LLC and Gaylord Kellogg be provided a sufficient opportunity to review and comment on the Reroute. *See Northwest Environmental Defense Ctr. v. Bonneville Power Administration*, 117 F.3d 1520, 1534-35 (9th Cir. 1997); *Price Road Neighborhood Ass'n v. United States Department of Transportation*, 113 F.3d 1505, 1511 (9th Cir. 1997).

17-3

3. Cooke Coleman LLC and Gaylord Kellogg Were Denied the Opportunity to Comment on the Reroute During the Scoping Process and Have a Limited Ability to Prepare Sufficient Comments During the Short DEIS Comment Period.

The critical opportunity for the property owner most affected by the Reroute to provide public comment was lost due to the fact that the scoping process did not include the Reroute alternative as part of the Proposal. BPA did not include the Reroute in any scoping notice and did not discuss the Reroute at any public scoping meeting. Appendix A to DEIS. No person or agency

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has been given the opportunity to review or comment on the Reroute until publication of the DEIS. Cooke Coleman LLC and Gaylord Kellogg have been denied a significant chance under the National Environmental Policy Act to analyze and provide meaningful comment on the possible Reroute.

Since publication of the DEIS last month and discovery of the fact that *two* transmission lines may be constructed across the Kellogg Family Ranch, Mr. Kellogg has attempted to gather information regarding potential environmental impacts on his property and obtain public information from the BPA pursuant to the Freedom of Information Act on short notice. *See* Attachments 9, 11, 14, and 16. However, BPA has been unable to respond to most of the FOIA requests prior to the close of the brief 45-day comment period on the DEIS. Although Mr. Kellogg has requested an extension of the public comment period, which BPA has authority to grant pursuant to 40 C.F.R. § 1506.10(d), BPA has denied such a request on the basis of "BPA's urgent need to meet the project energization date." *See* Attachment 13. Further, BPA has promised responses to many of the FOIA requests on March 29, 2002 – four days *after* the close of the public comment period. *See* Attachment 15. Therefore, Cooke Coleman LLC and Gaylord Kellogg are significantly hampered in their ability to provide complete public comment on the DEIS, because they do not yet have access to information on which the decision to include the Reroute alternative was based.

17-4

B. A Draft Supplemental Environmental Impact Statement is Warranted.[2]

The recent inclusion of the Reroute alternative in the DEIS comprises a "substantial change" in the Proposal which was not previously contemplated, and raises "significant new circumstances or information relevant to environmental concerns," thereby requiring preparation of a draft supplemental environmental impact statement pursuant to 40 C.F.R. § 1502.9(c)(1). Because the Reroute was included at a late stage of environmental review of the Proposal and was not preceded by proper scoping, the DEIS does not comply with 40 C.F.R. § 1502.9(a), which requires draft environmental impact statements to be "prepared in accordance with the scope decided upon in the scoping process."

Until preparation of a draft supplemental environmental impact statement for the Proposal, impacts of the Reroute alternative will remain unexamined and meaningful public comment on the Reroute will be precluded. *See, e.g., Kettle Range Conservation Group v. United States Forest Service*, 148 F. Supp.2d 1107, 1138-41 (E.D. Wash. 2001) (ruling that supplemental environmental impact statement was warranted in part due to changes to maps of certain units); *see also Dubois v. United States Department of Agriculture*, 102 F.3d 1273, 1292 (1st Cir. 1996), *cert. denied*, 117 S. Ct. 2510 (1997) (holding that a new alternative in an environmental impact

[2] BPA has been separately requested to prepare a draft supplemental environmental impact statement to analyze environmental impacts of the Reroute in a March 11, 2002 letter sent on behalf of Cooke Coleman LLC and Gaylord Kellogg. At the time of drafting these formal comments, BPA has not responded to such request.

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statement was 'not merely a reduced version of a previously considered alternative," but a different configuration of activities and locations, and thus had to be exposed to adequate public comment). Inclusion of an alternative that has not been studied renders an environmental impact statement inadequate as a matter of law. *See Alaska Wilderness Recreation and Tourism Ass'n v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995); *Resources, Ltd. Inc. v. Robertson*, 35 F.3d 1300, 1305 (9th Cir. 1994).

17-5

Here, the DEIS does not contain any meaningful analysis of potential environmental impacts of the Reroute, which is planned to cross approximately .6 of a mile of the Kellogg Family Ranch. Analysis in the DEIS is almost exclusively limited to those impacts that might result from construction of Segment A as originally contemplated along a route which crosses Indian allotment land, running next to existing BPA transmission lines. In the limited instances in which the Reroute is mentioned in the DEIS, a summary statement– without analysis or citation – erroneously concludes that impacts along the Reroute would not be any different in degree or kind than impacts along the original route. Examples of this conclusory treatment of Reroute impacts are detailed in Section C, below.

No environmental studies have been performed along the portion of the Reroute which crosses the Kellogg Family Ranch. There is thus no basis for BPA to conclude that impacts along the Reroute would be the same as impacts along the Reroute. Moreover, the assertion that the degree of impacts resulting from the Reroute alternative would not be different in kind than those from construction of Segment A along the original route ignores the important fact that the Reroute is more than a quarter mile longer and involves construction of a new transmission line, *and* removal and re-construction of the existing BPA transmission line. The full extent of environmental impacts associated with such contemplated action should be analyzed in a draft supplemental environmental impact statement.

C. Impacts to the Kellogg Family Ranch Have Not Been Adequately Studied.

17-6

NEPA requires an agency to take a "hard look" at the environmental consequences of its actions. *E.g., Metcalf v. Daley*, 214 F.3d 1135, 1141 (9th Cir. 2000). An environmental impact statement is required to provide "full and fair discussion of significant environmental impacts and shall inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." *Greenpeace v. National Marine Fisheries Service*, 55 F. Supp.2d 1248, 1269-70 (W.D. Wash. 1999). Analysis of alternatives should provide a clear basis for choice among options by the decisionmaker and the public. *Id.* The form, content and preparation of an environmental impact statement must foster both informed decision-making and informed public participation. *Neighbors of Cuddy Mountain v. United States Forest Service*, 137 F.2d 1372, 1376 (9th Cir. 1998). An agency may not select a particular alternative for action unless such alternative is adequately discussed and evaluated in an environmental impact statement. 40 C.F.R. § 1505.5(e).

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Courts are required to strictly interpret the procedural requirements in NEPA and supporting regulations "to the fullest extent possible." *Lathan v. Brinegar*, 506 F.2d 677, 687 (9th Cir. 1974. "Grudging, pro forma compliance will not do." *Id.* at 693. General statements about "possible" effects and "some risk" do not constitute a "hard look," required under NEPA absent justification regarding why more definitive information could not be provided. *Neighbors of Cuddy Mountain*, 137 F.2d at 1380.

Here, potential environmental impacts of the Reroute alternative have not been considered to the extent required under NEPA, if at all. Impacts to the Kellogg Family Ranch and other properties over which the Reroute is proposed to cross have been summarily assumed to be the same as impacts that would occur along the shorter, straight route next to the original transmission lines. Significant portions of the DEIS do not even mention the Reroute or factor in its longer, more circuitous route. Discussion of the impacts resulting from removal of the existing transmission line along the current route is entirely absent from the DEIS. The DEIS does not even contain a sufficient description of where the Reroute will be located, which is confusing and misleading to any person or agency desiring to provide comment on the Proposal. Each of these deficiencies is discussed in the following sections.

1. Description of Reroute is Unclear and Inaccurate.

17-7

The Reroute is described in a single paragraph on page 2-2 of the DEIS, at the end of the section overviewing Segment A, as follows:

> There is a small potential reroute within Segment A, referred to on Map 2, Alternatives, and shown in detail on Map 3, *Reroute in Segment A*. The existing Schultz-Vantage line and the new transmission line would be rerouted to the south of the existing alignment. They would run parallel to each other at a separation of about 300 feet. **A little over a mile in length, the reroute would start about a half-mile south of Coleman Road**. The lines would be rerouted to the south and then the east, joining the existing alignment just west of Colockum Road.

(emphasis added). This description is not clear as to the precise location of the Reroute. In fact, the description quoted above does not even match Map 3 in the DEIS, which is intended to illustrate the Reroute. These errors seriously impede the efforts of any interested person or agency reviewing the DEIS and wishing to make comment on the Proposal.

17-8

The errors further raise the question that, if the BPA is not even clear as to where the Reroute would be located, how can it be satisfied that impacts of the Reroute would be the same as those along the original route? Moreover, one may conclude that the inaccurate description of the Reroute indicates its last-minute inclusion in the DEIS, which left BPA insufficient time to accurately describe the Reroute prior to DEIS publication, much less analyze its impacts.

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2. The Reroute is Not Factored Into Distance Calculations of Segment A.

17-9

The DEIS consistently misrepresents Segment A as 29.4 miles long. *E.g.*, DEIS pages S-3[3], 2-2, 3-56. This calculation fails to take into consideration the fact that the Reroute would add approximately .29 of a mile to the length of Segment A. This fact is not reflected in any charts supporting analysis in the DEIS. *See, e.g.*, Tables 2.2-1 and 2.2-2, at page 2-7 of the DEIS (reflecting estimates of access road development and access road disturbance for the preferred alternative, which estimates do not include or reference the Reroute), Table 3.7-2 (stating distance and percentage of privately and publicly administered lands in project area, not including Reroute), Table 3.7-3 and Table 3.7-4 (stating distance of land uses crossed by project area, not including Reroute), pages 3-56 through 3-57 (stating percentages of Segment A which cross privately owned and publicly administered lands, not including Reroute figures).[4] In fact, Table 2.8-1, Summary of Impacts, at pages 2-21 through 2-30 of the DEIS does not contain any reference to or analysis of the Reroute.

NEPA obligates agencies such as BPA to make accurate, relevant environmental information available for review before decisions are made and before actions are taken. 40 C.F.R. § 1500.1(b). Internal inconsistencies in an environmental impact statement, as are present here in BPA's DEIS, may render the statement legally deficient. *See National Audubon Society v. Butler*, 160 F. Supp.2d 1180 (W.D. Wash. 2001).

3. Construction Impacts Resulting from Removal and Reconstruction of the Existing Line Are Not Analyzed.

17-11

Entirely absent from the discussion of environmental impacts in the DEIS is consideration of the fact that the Reroute alternative will involve both the *construction* of a new transmission line along a wholly different, longer route than originally contemplated for Segment A, *and removal and reconstruction* of an existing transmission line next to the new transmission line, which existing line currently runs along a relatively straight route through Indian allotment land. For

17-10

[3] It should be noted that the 35-page Summary at the beginning of the DEIS does not contain a single mention of the Reroute. Not only does this section misrepresent Segment A as being 29.4 miles long (page S-3), but the Summary contains many other inaccuracies concerning the cost of the preferred alternative (page S-5), the size and amount of right-of-way needed, amount of clearing, location and number of access roads (page S-6), and discussions of impacts of the preferred alternative on floodplains and wetlands, vegetation, wildlife, fish resources, land use impacts, socioeconomics, visual resources, recreation resources, cultural resources and public health and safety – each of which would be more greatly and/or differently affected by the construction of the Reroute alternative involving two transmission lines and removal of the existing line, than the original proposal to build a single line along the relatively straight current transmission line route. An interested person reviewing the DEIS Summary would not even have notice of the fact that the Proposal now includes the Reroute alternative.

[4] Similar charts prepared for the analysis on each of the proposed alternatives also do not include the actual length of Segment A including the Reroute. E.g, Tables 2.3-1 and 2.3-2, Tables 2.4-1 and 2.4-2, Tables 2.5-1 and 2.5-2.

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this reason, analysis of construction-related impacts in the DEIS are significantly underestimated and not fully considered.

Without question, impacts will occur during construction of the two lines proposed for the Reroute, as well as during the removal of the existing transmission line proposed to be replaced along the new route. The DEIS discusses some potential impacts of construction of one new line, but fails to include the extensive additional construction activities associated with the Reroute in any analysis.

17-12

As an initial matter, Section 2.2.2 of the DEIS, at page 2-5, states that a new right-of-way would be needed for the new structures and line, at a width of 150 feet. But, there is no discussion of how wide the right-of-way would need to be along the Reroute, since the Reroute proposal envisions construction of two lines (the new line and reconstruction of the existing line). Documents provided by the BPA in response to recent FOIA requests indicate that the new right-of-way for the Reroute would be **350 feet** (more than twice as wide as required for the original route), but this fact is not indicated anywhere in the DEIS. *See* Attachment 15. These documents further reflect the fact that the area of disturbance will change as a result of the Reroute by replacing and removing towers on the existing line. *Id.* Again, this analysis did not make it into the DEIS.

17-13

Section 2.2.3 regarding clearing and Section 2.2.4 regarding access roads on pages 2-6 through 2-7 of the DEIS (plus supporting Tables 2.2-1 and 2.2-2) also do not contain complete or accurate information because the Reroute is omitted from this analysis. Therefore, an interested person wishing to make public comment cannot determine how wide the right-of-way of the Reroute will be, how much new construction is required, how many new roads will be constructed, or how much land will be cleared for the Reroute.

17-14

Section 4.1.2 of the DEIS, at pages 4-4 through 4-6, details many of the construction impacts on soils and geology that would result from access road construction and improvements, maintenance activities, right-of-way clearing and site preparation for structures and other facilities.[5] Even though it is acknowledged that "New crossings would disturb the soil surface; increase erosion, runoff and sedimentation in nearby watercourses; impair soil productivity and remove land from production," (DEIS at page 4-4), the DEIS does not provide any detail regarding a comparison of construction impacts between the original Segment A and the more intensive work required to construct the Reroute.

[5] Appendix B to the DEIS, detailing Construction and Maintenance Activities, also does not mention the proposed Reroute in its extensive discussion of right-of-way acquisition and preparation, access road system, construction of structures, and site restoration and clean-up.

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17-14 cont.

Section 4.3.1 of the DEIS, at pages 4-22 through 4-25, details significant impacts to vegetation from construction-related activities, which in turn leads to increase in water temperature and water velocity and decreases wildlife habitat and further results in erosion of stream banks and deposition of sedimentation into waterways. DEIS, page 4-23. Of particular concern is the fact that construction and replacement of support structures requires removal of large areas of vegetation and use of heavy machinery to compact soils. DEIS, page 4-24. These activities can result in decrease of slope stability and degradation of plant habitat. DEIS, pages 4-24 through 4-25. However, the DEIS does not mention the significantly greater scope of construction activities associated with the Reroute alternative, compared with the original Segment A.

Similarly, pages 4-37 through 4-38 of the DEIS discuss construction impacts on wildlife. The DEIS notes that a wide variety of species including deer, elk, wintering bald eagles, nesting raptors, waterfowl and small rodents will be disturbed by construction, and some species may abandon their nests entirely if the disturbance is severe. Although construction associated with the Reroute will disturb more than twice as much area (removal of existing line and construction of two lines instead of one) as the original Segment A proposal, the DEIS does not discuss these differences or their impact on the surrounding area.

Section 4.5.2 of the DEIS, at pages 4-52 through 4-56, considers the construction, operation and maintenance impacts on fish resources resulting from the Project. A long list of serious impacts includes damage to fish or fish habitat from construction sediments in streams, soil from roads, cleared areas, excavations, stockpiles or other construction sources may increase sediment load or deposition in spawning gravels, concrete washing or dumping might enter streams, other construction materials (metal parts, insulators, wire ends, etc.) might enter streams, mechanical disturbance of fish habitat from equipment operating in or crossing streams, streambank compaction or sloughing – reducing ability to support vegetation, substrate disturbance, vibration or shock from operating equipment, hazardous materials spills, including petroleum products and hydraulic oil, and impacts resulting from clearing of land for structure construction and access roads. Again, the DEIS fails to mention the additional construction activities and their impacts that would result from the Reroute.

It is unclear if Table 4.6-1 on page 4-67 of the DEIS accurately describes structure and access road impacts, although it appears not to include the Reroute in its data. However, there is clearly no discussion of the Reroute in Section 4.6.2 on page 4-67 through 4-68 regarding land use impacts common to construction alternatives. Nor is there any mention of the Reroute in Section 4.8.2 on page 4-88 of the DEIS regarding visual impacts common to construction alternatives, or in Section 4.9.2 on page 4-96 of the DEIS regarding recreation impacts common to construction alternatives. Given the probability that the Reroute alternative will take more time to construct (because the new route is longer and more circuitous than the existing route and because the existing transmission lines are planned to be removed and reconstructed along the new route), affected properties and resources are likely to be affected to a greater and different degree than if

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the new line is constructed along the existing route. Such impacts should have been analyzed in the DEIS.

The intensive construction activities associated with the Reroute alternative also are not analyzed in Section 4.10.2 on pages 4-100 through 4-102 of the DEIS pertaining to cultural resources impacts. The DEIS cautions that "Any ground-disturbing activity within the boundaries of a significant cultural resource would be destructive, resulting in the permanent, irreversible, and irretrievable loss of scientific information and/or cultural value." DEIS, at page 4-100. Further, even non-ground-disturbing activities such as cutting vegetation and road easements may have negative impacts on cultural resources. *Id.* The DEIS discusses the fact that grading and backfilling, use of heavy equipment, construction of support structures and access road repair, improvement and construction could significantly impact cultural resources and may even lead to "permanent, irreversible damage." *Id.* Inexplicably, the DEIS lacks any discussion of the construction activities required to remove the existing transmission line located on Indian allotment land. Nor does the DEIS acknowledge that a significantly wider area would be required to be cleared and disturbed for construction of two lines (not just the single proposed new line) along the new Reroute.

17-15

Map 11 of the DEIS indicates that the area of the potential Reroute (even though the Reroute itself is not shown on the map) includes one of the most significant cultural resource areas affected by the Proposal. The Kellogg Family Ranch and other properties along the Reroute were historically used by Native Americans for traditional gathering areas and bear evidence of early settlers' historic home sites. As Section 4.3.4 on page 20 of Appendix H to the DEIS cautions, "Traditional gathering areas may be affected by construction, or by the introduction of non-native vegetation. A camas gathering area, for example, may be ruined by the introduction of invasive non-native plants." No studies have been conducted to determine the impact on traditional cultural properties ("TCP") located on the Kellogg Family Ranch, however. Instead, the DEIS and Appendix H defer further study and analysis of potential impacts to cultural resources to a later date. Of course, without such study included as part of the DEIS, interested persons are unable to review and comment on the conclusions reached regarding cultural resources impacts during this short 45-day comment period.

17-16

The failure of the DEIS to include any discussion regarding the substantial work that would have to occur along the existing route to remove existing lines, and along the potential Reroute to construct *two* separate lines can only be explained by the rushed nature of the BPA's recent inclusion of the Reroute alternative as part of the Proposal. These deficiencies, along with other procedural errors committed by the BPA as set forth in this letter, warrant preparation of a draft supplemental environmental impact statement studying the Reroute and its potential impacts.

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4. Vegetation Impacts of the Reroute Are Not Adequately Analyzed.

17-17

Vegetation impacts of the Proposal are discussed at pages 3-17 through 3-19 of the DEIS, but the only mention of the Reroute is a summary conclusion that the Reroute "would reduce impacts to forested lands and grasslands and increase the impacts to shrublands compared to Segment A." The DEIS concludes on page 4-27 that the Reroute would result in less of an impact to riparian vegetation than the original alignment and that more shrub-steppe area would be disturbed along the longer Reroute area.[6] Appendix E of the DEIS contains a 20-page study of plants potentially affected by the Proposal and a single sentence regarding the Reroute on page 4, as follows: "The Segment A reroute crosses an area of shrub-steppe similar to the original alignment, but crosses Cooke Canyon Creek in an area without significant riparian vegetation below the original alignment."[7] In reality, however, BPA documents disclosed in response to a FOIA request indicate that "there may be scattered cottonwoods in the reroute."

These statements published in the DEIS and Appendix E are not based on actual study and further are potentially misleading because they fail to disclose the fact that shrub-steppe vegetation (generally characterized by big sagebrush and bluebunch wheatgrass) is the natural, dominant plant species for this area. *See* Appendix E of the DEIS at page 2. As a result, an increase in impacts to shrublands – as is expected to result from the Reroute -- would threaten the natural plant community that is expected to occur without disturbance or alteration of habitat. *Id.* In fact, page 4-23 of the DEIS notes that "shrub-steppe plant communities are slow to recover from disturbance." Photographs illustrating BPA's current survey and tower maintenance practices and their detrimental impact to vegetation and streams may provide some prediction of the negative impacts to be suffered on the Kellogg Family Ranch with approval of the Reroute alternative. *See* Attachments 29, 30 and 31.

The value of natural vegetative habitat is revealed in part on page 4 of Appendix E, which mentions that one area of Segment A covered by big sagebrush/bluebunch wheatgrass (i.e. shrub-steppe vegetation) is sufficiently pristine to qualify as a Washington Natural Heritage Program ("WNHP") high quality plant association. This study also notes that several intermittent creeks along Segment A support channel vegetation consisting of ocean-spray, rose, hawthorn and sagebrush, with an understory of cheatgrass, yarrow, chicory and other species.

There is no discussion in the DEIS or Appendix E evidencing any actual study of vegetation located on the Kellogg Family Ranch, or any other portion of the Reroute. Nor is there any detailed description of the types of vegetation found along the Reroute. Table 3.4-1 and 3.4-2

[6] As noted above in Section C.3 of this letter, there is no discussion regarding impacts to vegetation resulting from removal of the existing line and construction of *two* lines along the Reroute.

17-18 [7] With the exception of Map 3, the DEIS consistently and erroneously refers to Cooke Creek as Cooke Canyon Creek.

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17-18 cont.

regarding vegetation cover types by segment and by alternative, on page 3-18 of the DEIS, do not appear to even include data regarding the Reroute (see also Table 1 in Appendix E).

Further, the DEIS and Appendix E both refer to plant surveys that were conducted in August 2001 – before the Reroute alternative was included as part of the Project. Therefore, there has been no study to determine if any federal listed and candidate rare plant species exist in the Reroute area. This is particularly unsettling given the fact that Appendix E at page 12 notes that "Potential Ute ladies' tresses habitat may occur in the wetland areas adjacent to Cooke Canyon Creek along Segment A." Other known occurrences of rare plant species occurring along Segment A include Hoover's tauschia (threatened), Pauper milk-vetch (sensitive), Beaked cryptantha (sensitive), Longsepal globemallow (sensitive), and Suksdorf's monkey flower (sensitive). *See* Table 7, page 15-16, Appendix E; see also pages 3-26 through 3-30 of the DEIS.

It is possible that the Kellogg Family Ranch includes or could support pristine shrub-steppe vegetation to qualify as a WNHP high quality plant association. It is also possible that rare plant species exist on the Kellogg Family Ranch or other portions of the Reroute. However, BPA has not completed any study of these affected areas to determine the true extent and nature of impacts to vegetation as a result of the Reroute. Given all these omissions, NEPA requires that actual study of vegetation impacts resulting from the Reroute be completed in a draft supplemental environmental impact statement.

5. Wildlife Impacts of the Reroute Are Not Adequately Analyzed.

17-19

Potential wildlife impacts along the Reroute (other than fish impacts, discussed below in Section C.6 of this letter) are summarily mentioned in only two locations of the DEIS. First, page 3-32 states without support that "Species present along the proposed reroute are expected to be similar to those discussed for the original Segment A alignment." This is followed by a single sentence on page 4-40 of the EIS, baldly stating: "The Segment A reroute would have the same impacts to wildlife species as the original alignment discussed above." Appendix F to the DEIS includes a 68-page Fish and Wildlife Technical Report, dated January 8, 2002, plus two addenda, all of which do not contain any mention or analysis of the Reroute alternative.

Page 32 of the Fish and Wildlife Report in Appendix F notes that approximately 150 wildlife species (birds, mammals, reptiles and amphibians) are known to use the shrub-steppe habitat type for some part of their lifecycle. Removal of significant areas of shrub-steppe is contemplated along the Reroute, and thus likely will impact a number of species (some of them threatened or endangered) currently living on or near the Kellogg Family Ranch, including but not limited to great horned owls, red tail hawks, mule deer, bald eagles, Quilomene elk, pygmy rabbit, sharp tailed grouse and sage grouse. The extent and nature of such impacts cannot be determined absent actual study of the Reroute area.

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17-19 cont.

The DEIS admits in a separate section, page 4-27 regarding vegetation impacts, that more shrub-steppe area would be disturbed along the longer Reroute area than along the original route (not to mention the wider right-of-way area required for construction of both the new line and re-construction of the existing transmission line which will be removed from the current straight route). However, it erroneously assumes that the Reroute would result in less of an impact to riparian vegetation than the original alignment. DEIS, page 4-27. A review of the definition of riparian vegetation on page 9-12 of the DEIS glossary indicates that "riparian vegetation" includes "vegetated areas surrounding streams, rivers, lakes or wetlands." Thus, removal of any type of vegetation surrounding stream channels along the Reroute – including shrub-steppe – would result in impact to riparian vegetation, contrary to the statements in the DEIS.

Serious questions are raised regarding the propriety of the assumption – without any supporting analysis in the DEIS -- that impacts to wildlife resulting from the Reroute proposal would not differ from impacts along the original shorter Segment A route. BPA should prepare a draft supplemental environmental impact statement analyzing wildlife impacts resulting from the Reroute alternative, based on actual studies of the affected areas.

6. Fish Resources Impacts Are Not Adequately Analyzed.

17-20

No actual study of potential impacts to fish resources resulting from the Reroute alternative preceded publication of the DEIS. Map 6 in the DEIS purports to illustrate fisheries impacts, but the map does not even show the Reroute location. Appendix F to the DEIS, the Fish and Wildlife Technical Report published in January 2002, contains more than 26 pages studying fish impacts of the Proposal, but does not mention the Reroute at all.

Considering the significant measures the state and federal government have employed to protect fish resources, including recent listing of threatened and endangered species, a reasonable person would expect more than the summary conclusion on page 4-56 of the DEIS:

> The proposed reroute of part of Segment A would move the crossing of Cooke Canyon Creek south by approximately .3 mile to an area with much less riparian vegetation and multiple channels. Less riparian vegetation would have to be removed in this area; therefore impacts to fish would be less than the original alignment.

Again, as discussed in Section C.5 of this letter, riparian vegetation includes shrub-steppe and other vegetation located on the banks of the multiple braided channels of Cooke Creek, over which the Reroute would cross. As a result, the conclusion is patently wrong. The conclusion also ignores the substantial and serious construction-related impacts that will likely occur during the construction of *two* lines instead of the one line analyzed for the original route, *and* the removal of the existing line, undoubtedly resulting in much greater impacts to the affected area. *See* Section C.3, above.

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17-20 cont.

If the BPA had consulted with the property owner of the Kellogg Family Ranch and conducted proper scoping with respect to the Reroute proposal, BPA would have learned that Mr. Kellogg is working to restore portions of the property to its natural, native state. Restoration of natural vegetation along Cooke Creek and nearby Coleman Creek would in turn, bring back the habitat enjoyed in this area for many years by a variety of anadromous fish species. Moreover, actual study of the area affected by the Reroute might show the existence of indigenous red banded rainbow, bull trout (federal threatened species) and west slope cutthroat in Cooke Creek.

A draft supplemental environmental impact statement is required under NEPA, so that study of potential fish resources impacts of the Reroute, taking into consideration the wider right-of way required for installation of the new line and re-constructed original line, removal of the original line, and significantly larger scope of construction-related impacts is completed prior to BPA's decision on the Proposal.

7. Floodplains and Wetlands Impacts of the Reroute Are Not Adequately Analyzed.

17-21

The discussion of floodplains and wetlands at pages 3-6 through 3-9 of the DEIS fails to mention the Reroute in its discussion of Segment A. It is unclear whether or not the statement that there will only be 22 crossings of intermittent streams in Segment A includes the number of stream crossings expected along the Reroute. However, neither Map 4 (water resources) or Map 5 (wetlands/plants locations) in the DEIS includes a depiction of the Reroute, thereby making it difficult to provide public comment on the maps' accuracy.

The DEIS also mentions that an "unavoidable direct impact to wetlands would result from building access roads." DEIS, page 4-12. But there is no information regarding the number or location of access roads required for the Reroute and thus no analysis of actual impacts to wetlands that might occur.

Site-specific studies of the Kellogg Family Ranch, which were not conducted by the BPA in preparing the DEIS, indicate that the Reroute is proposed to run through a larger braided area of the Cooke Creek alluvial fan than the original route, requiring the crossing of numerous additional stream channels. Experts consulted by Cooke Coleman LLC and Gaylord Kellogg opine that each channel historically supported a variety of native vegetation, which would be threatened by construction and maintenance activities of the BPA along the Reroute. Mr. Kellogg has begun to take steps toward restoring portions of the Kellogg Family Ranch to a natural state, as it existed prior to widespread cattle grazing. Recognizing that the clearing and other construction activities associated with the Proposal require extensive removal of shrub-steppe and other natural growth, restoration efforts at the Kellogg Family Ranch would be seriously hampered if the Reroute alternative is constructed.

17-21 cont.

Without any actual study of the Reroute, or any prior notice to Cooke Coleman LLC and Gaylord Kellogg so that there would be an opportunity for the property owner to comment on the Reroute, the BPA concludes on page 4-13 of the DEIS:

> The reroute in Segment A would result in the same impacts as shown in Table 4.2-1, Segment A Impacts to NWI Mapped Wetlands. Cooke Canyon Creek would be crossed further to the south, resulting in a moderate impact.

Not only is the location of the Reroute distinct from the location of the original Segment A, resulting in different types of impacts, but the degree and extent of impacts also will be greater if the Reroute alternative is selected. As noted above, the Reroute includes the construction of *two* lines instead of the one line analyzed for the original route, as well as removal of the existing line, undoubtedly resulting in a far greater impact to the affected area. Because the nature and extent of floodplains and wetlands impacts that would result from the Reroute are not examined in the DEIS, its analysis is deficient.

8. Land Use Impacts of the Reroute Are Not Adequately Analyzed.

17-22

The DEIS does not include the Reroute in any of its discussion of land use impacts at pages 3-51 through 3-57, or supporting tables and maps (Table 3.7-2, Table 3.7-3, and Table 3.7-4; and Map 7 and Map 9). Curiously then, the DEIS concludes at page 4-71:

> The proposed Segment A reroute of approximately 1.3 miles would cross 1.2 miles of private land and 0.1 miles of BLM land. Impacts to these land uses would be the same as those impacts described along the original Segment A alignment.

Notwithstanding the lack of analysis or study to support this conclusion, it is clearly wrong. The Reroute is more than a quarter mile longer than the original alignment. It will cross more privately-owned land than the original route, including approximately .6 of a mile across the Kellogg Family Ranch. It will require a wider right-of-way to accommodate construction of both the new line and re-construction of the existing line. And, it will require removal of the existing line along the original route. None of these factors have been taken into consideration in the conclusion of the DEIS.

17-23

Impacts on the property value of the Kellogg Family Ranch also have not been studied or considered. Pages 4-84 through 4-85 of the DEIS summarily state that "The new line is not expected to cause overall long-term adverse effects on property values." There is no mention of the Reroute in this section, or the right-of-way that is more than twice the size of the original right-of-way for the new line, required for construction of two lines. Actual study of the potential impact of the property value of the Kellogg Family Ranch would likely show a clear decrease in property value with two transmission lines crossing approximately .6 of a mile of the property fronting on two county roads: Cooke Canyon Road and Gage Road.

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17-24 The potentially devastating effect of the Reroute on Mr. Kellogg's restorative plans for portions of the Kellogg Family Ranch have been previously noted in this comment letter. BPA did not consult with Cooke Coleman LLC or Mr. Kellogg before deciding to include a Proposal over the Kellogg Family Ranch of this magnitude. Not only is the Ranch threatened by the Reroute proposal, but impacts on the current use of the property have not been studied. None of the following potential impacts have been studied with respect to the Kellogg Family Ranch or other properties along the Reroute: (1) noise and vibration impacts from construction and maintenance of two transmission lines; (2) noise impacts from operation of two transmission lines; (3) radio frequency interference impacts from operation of two transmission lines; (4) potential release of toxic and hazardous materials during construction and maintenance of two transmission lines; (5) electric and magnetic field impacts from operation of two transmission lines; (6) impacts to groundwater sources and springs resulting from 15' x 15' x 16' deep excavations for the construction of support structures for two transmission lines, and attendant impacts on availability of water for irrigation, livestock or wildlife. As the enclosed videotape shows, noise impacts experienced on the Kellogg Family Ranch from two transmission lines will be significant and deleterious. *See* Attachment 6.

Each of these potential impacts of the Reroute should be studied in a draft supplemental environmental impact statement. Until the impacts of the Reroute are fully studied and considered, selection of the Reroute alternative is precluded under NEPA.

9. Visual and Recreation Resources Impacts of the Reroute Are Not Adequately Analyzed.

17-25 Analyses in the DEIS of potential visual and recreation resource impacts of the Reroute are deficient for many of the same reasons as the analysis of land use impacts. The Reroute is not mentioned in the discussion of view impacts at pages 3-71 through 3-74 of the DEIS, or the discussion of recreation resource impacts at pages 3-90 through 3-91. Neither the description of Segment A on pages 3-73 through 3-74, nor Map 10 (visual analysis) includes any indication of the Reroute. There are no photographs or other visual analysis of properties along the Reroute. In fact, page 4-89 of the DEIS concludes that "the proposed structures would not dominate or become the focal feature because they would be located parallel to an existing transmission line that already impacts views." This is not the case for the Reroute.

The DEIS eventually reveals on page 4-90 that the Reroute will be in a Visually Sensitive Area and that the transmission line structures would be closer than what is shown on Photo 4.8-2 (page 4-89 of the DEIS). There is no photo included in the DEIS to show the actual impact on the Colockum Pass Visually Sensitive Area.[8] Moreover, the DEIS's discussion of impact only mentions moving the *new* transmission line to the Reroute area. It entirely omits the fact that *two*

[8] There is no explanation in the DEIS as to why Colockum Pass is more visually sensitive than Cooke Canyon and Coleman Canyon.

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17-25 cont. transmission lines are proposed in the Reroute alternative, because the original line will also be reconstructed along the Reroute. The analysis in the DEIS in this regard is thus misleading, as well as incomplete.

The DEIS also notes that a "high" impact to visual resources results when the transmission lines would become a view's dominant feature or focal point. As shown in the enclosed attachments 21 through 35, the construction of two transmission lines along the Reroute relocates the transmission lines from the background of views enjoyed from the Kellogg Family Ranch, where they are currently dwarfed by the surrounding hills, to new much closer positions that dominate views of the surrounding hills including Coleman Canyon, Cooke Canyon and Colockum Pass. As the photographs included with this comment letter illustrate, the Reroute alternative will result in significant visual impacts to the Kellogg Family Ranch, which impacts are not discussed or analyzed at all in the DEIS. The existing bucolic scenes will be converted into a view dominated by cold steel transmission lines, forever altering the natural beauty of this property. The Kellogg family has been sensitive to the high value of the scenic views in this area, expending substantial resources to bury their own power lines to remove them from their views of the surrounding hills.

The general public traveling along Cooke Canyon Road, Coleman Road and Gage Road also will have the transmission lines in their dominant view. But the DEIS includes no study or analysis of view impacts from these locations, and thus no opportunity for the general public to comment.

Unstudied visual impacts of the Reroute will also affect the recreational qualities of the Kellogg Family Ranch. Without any supporting analysis, the DEIS concludes at page 4-97 that "The reroute in Segment A would not increase the level of impact to recreational activities." Of course, had the BPA consulted with the Mr. Kellogg as is required under NEPA, it would have discovered the significant value the Kellogg Family Ranch holds as a potential future natural preservation tract, and the recreational activities currently enjoyed by Mr. Kellogg, his family and friends, some of which are shown in the enclosed photographs. *See* Attachments 32-35. The construction of two transmission lines over approximately .6 of a mile of the Kellogg Family Ranch threatens to impact native vegetation, wildlife and fish, alter natural stream and groundwater flows, create constant noise and visual blight and dominate the visual scene from many areas of the property. All of these impacts would not be felt to the same degree with construction of only the single new line along the shorter original Segment A route.

Studies of the visual and recreational impacts that will likely result on the properties over which the Reroute is planned should be completed in a draft supplemental environmental impact statement. The general, conclusory and incomplete statements regarding these impacts in the DEIS do not constitute a "hard look," as required under NEPA.

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10. Cultural Resources Impacts of the Reroute Are Not Adequately Analyzed.

17-26

Potential impacts on cultural resources resulting from the Reroute are largely ignored and/or minimized in the DEIS. Map 11 purports to show cultural areas along the entire project, but fails to indicate the location of the Reroute. Table 4.10-1, Summary of Sensitive Areas by Alternative on page 4-103 of the DEIS, apparently does not include the Reroute.

Appendix H to the DEIS is a 30-page Phase I Cultural Resources Assessment (Revision 3, dated January 2002). Although page 15 of this report cautions that "Impacts and appropriate mitigation measures vary with the specifics of individual resources, [and] consideration of alternatives must include consideration of site-specific impacts," this report concludes *without* any site-specific study of the Kellogg Family Ranch that "The proposed realignment of a portion of Segment A in the vicinity of Coleman Creek Road will not affect any recorded cultural resources not already accounted for in Table A1." As with other impact discussions in the DEIS and supporting appendices, there is no mention of the fact that a wider right-of-way will be required for two transmission lines along the Reroute, or the significant disturbances to the original route that will likely occur during removal of the original transmission line.

In a separate comment letter dated March 16, 2002, Professor Morris L. Uebelacker opines that the impacts to cultural resources as a result of the Reroute alternative are greater and more extensive than indicated in the DEIS. *See* Attachment 18. Professor Uebelacker advises "intensive field and archival research" along the Reroute area because the area "crosses through distributions of historic artifacts associated with early agricultural settlement of the valley." *Id.* He further states that it is "extremely likely that buried archaeological places exist in the proposed reroute and substantial surface and sub-surface evaluations will be required." *Id.*

Potential impacts to cultural resources should not be lightly dismissed. Even the DEIS and Appendix H note the fact that ground disturbing activity within boundaries of significant cultural resources is destructive, resulting in permanent, irreversible damage. Clearing vegetation, even without ground disturbance, affects most types of traditional cultural properties ("TCP"). BPA has not performed any site-specific studies along the Reroute and the DEIS does not contain a full and fair discussion of significant environmental impacts to inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment. Full consideration of potential cultural resource impacts of the Reroute proposal should be included in a draft supplemental environmental impact statement.

D. **Conclusion.**

The efforts of Cooke Coleman LLC and Gaylord Kellogg to take steps to restore portions of the Kellogg Family Ranch to its native state are seriously threatened by the BPA's inclusion of the

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Reroute as an unexamined alternative in the DEIS. BPA has failed to comply with NEPA public participation requirements, significantly limiting the ability for interested persons – here, the owner of the property over which two proposed transmission lines would run – to provide meaningful comment on the Proposal. The DEIS itself includes inaccurate, incomplete and misleading information. Impacts resulting from the Reroute have been either ignored or summarily assumed to be the same as impacts resulting from construction of a single new line along the original route for Segment A.

Construction of both the new and existing lines along a circuitous route which collectively for both power lines is nearly .29 of a mile longer than the original straight route will likely result in impacts to various elements of the affected environment to a different degree and in a different manner than the originally planned construction of only one line next to the existing transmission line. Impacts to these elements of the environment will also likely result from the removal of the existing transmission line. These impacts have not been adequately studied or analyzed in the DEIS. A supplemental draft environmental impact statement should be prepared to evidence a full consideration of the potential impacts of the Reroute alternative, as mandated by NEPA.

Thank you for your consideration of these comments. Please contact us if you have any questions.

Very truly yours,

WILLIAMS, KASTNER & GIBBS PLLC

/s/ Stephanie M. Hicks

P. Arley Harrel
Stephanie M. Hicks
Attorneys at Law

Enclosures
cc: Clients
Nancy Wittpenn, Environmental Lead
Carol Borgstrom, Director, Office of NEPA Oversight
Environmental Protection Agency, Attention Office of Federal Activities
John Iani, Regional Administrator, Environmental Protection Agency, Region 10

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INDEX TO ATTACHMENTS
BPA DEIS COMMENTS
Schultz-Hanford Transmission Project
Area of Proposed Reroute
Comments on behalf of Kellogg Family Ranch

AERIAL PHOTOS

1. Illustration of potential reroute in Segment A (Based on Map 3 from DEIS).
2. Aerial photograph of overview of Kellogg Family Ranch (dated May 11, 2002).
3. Aerial photograph of springs of Kellogg Family Ranch (dated May 11, 2001).
4. Aerial photograph of Manager's House site of Kellogg Family Ranch (dated May 11, 2001).
5. Aerial photograph of Coleman House and main facilities of Kellogg Family Ranch (dated May 11, 2001).

VIDEOTAPE

6. Videotape of noise emissions from BPA Power Lines in vicinity of Kellogg Family Ranch and cover letter (dated March 20, 2002).

DOCUMENTS

7. February 11, 2002, BPA website issuing Notice of Public Meeting to discuss DEIS on February 26, 2002 in Ellensburg at Hal Holmes Community Center, without address of meeting location.
8. February 11, 2002, fax from BPA, Nancy Wittpenn, with attached reroute map as the first visual indication to Gaylord Kellogg of the BPA reroute over the Kellogg Family Ranch (Gaylord Kellogg first learned verbally from Nancy Wittpenn on or about February 7, 2002, of the potential reroute).
9. February 12, 2002, FOIA request to BPA.
10. February 14, 2002, BPA acknowledgment of February 12, 2002, FOIA request by Gene Tollefson.
11. February 26, 2002, second FOIA request to BPA.
12. February 27, 2002, BPA acknowledgment of February 26, 2002, FOIA request and denial of request for expedited treatment by Gene Tollefson.

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13. March 6, 2002 BPA letter of Nancy Wittpenn denying February 12, 2002, request for extension of comment period deadline of March 25, 2002.
14. March 11, 2002 Request for extension of comment period and preparation of supplemental draft EIS.
15. March 15, 2002, Partial FOIA response of BPA to February 12, 2002, FOIA request, including documents produced, except oversized documents, Bates nos. 24, 25, and 26.
16. March 15, 2002, FOIA request to EPA.
17. March 15, 2002, request to EPA to find BPA DEIS inadequate.
18. March 16, 2002, comment to DEIS: letter of Professor Morris L. Uebelacker of Department of Geography and Land Studies, Central Washington University.
19. March 19, 2002, EPA Region 10 acknowledgment receipt of FOIA request.
20. July 2001 BPA Publication A Handy Guide to Meeting Bonneville's Environmental Requirements before the Funding of your Project (source: BPA website).

PHOTOGRAPHS

Franck Perkins Photos

Date range March 15, 2001 to March 7, 2002.

21. View is looking northeast towards Colockum Pass from old stock barn. Existing BPA power line in background. View of area to be impacted by the potential reroute. CD photo no. PC030021.
22. Coleman Creek photograph taken west of Coleman house. Area currently part of Kellogg Family Ranch conservation efforts. Conservation efforts jeopardized by reroute. CD photo no. PC060008.
23. Wild iris meadow looking north from north of Kellogg Family Ranch entrance. View of area to be impacted by the potential reroute. CD photo no. P5261031.
24. View to the east through snow covered trees along Coleman Creek conservation area of Kellogg Family Ranch west of manager's house. Conservation efforts jeopardized by reroute. CD photo no. PC030011.

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25. View northeast towards Colockum Pass from Coleman house corrals, main facilities at Kellogg Family Ranch. View of area to be impacted by the potential reroute. CD photo no. PC010028.

26. View of twisted tree looking north toward Cooke Canyon from meadow north of Gage Road on Kellogg Family Ranch with Cooke Creek in the background. Portion of land to be taken by potential reroute and view of area to be impacted by potential reroute. CD photo no. P6170021.

27. View of moon rising over meadows north of Kellogg Family Ranch driveway looking northeast toward Colockum Pass. View of area to be impacted by the potential reroute. CD photo no. PB290004.

28. View of Kellogg family recreating on Kellogg Family Ranch, with Cooke Creek and teepee spring in the background. View from teepee site to be impacted by potential reroute. CD photo no. PB100019.

Franck Perkins Photos dated before March 20, 2002

29. View looking north up Cooke Creek north of Gage Road on Kellogg Family Ranch. Illustrates area to be crossed and impacted by potential reroute. March 20, 2002 from Franck Perkins labeled "Creek N. of Gage Rd."

Gaylord Kellogg Photos taken March 3, 2002

Camera: Canon EOS 3, lens 28-135, flash Canon Speedlight 420 EX; used 50 mm setting. One frame 70.

Roll 1 Kodak Gold, 100 ASA, print film, 24 exp.
Roll 2 Kodak gold, 200 ASA, print film.

30. View of dry intermittent creek bed underneath existing BPA power line on Kellogg Family Ranch's seasonal irrigation source located on land of Todd Lopeman. Illustrates s tream channel pinch point resulting from tower construction and placement. Demonstrates BPA actual practice is detrimental to the environment contrary to statements in DEIS. Roll C: CD photo no. 010_7.

31. View of one of Cooke Creek channels with Cooke Creek Bridge in background. Shows detrimental impact to vegetation and creek due to BPA survey and maintenance practices. DEIS describes a conservative practice and this photograph illustrates actual BPA practices are detrimental to the environment contrary to statements in DEIS. Roll C: CD photo no. 015_12.

32. View of Spring in Cooke Creek alluvial fan (Vancil Spring) located on Kellogg Family Ranch south of Gage Road. Potential groundwater impact due to tower construction and

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placement of potential reroute. This is a view of one of many springs on Kellogg Family Ranch. Roll C: CD photo no. 025_22.

33. View from teepee site shown in Exhibit 28 on this index, looking north toward Cooke Canyon. View of area to be impacted by potential reroute. Roll D: CD photo no. 010_7.

Robin Kellogg Photos Taken December 29, 2001

34. View of William D. Ruckelshaus (1st and 5th EPA Administrator, current Commissioner of U.S. Commission on Ocean Policy appointed by President George W. Bush, and Chairman of Salmon Recovery Funding Board of State of Washington appointed by Governor Gary Locke) and family vacationing at Kellogg Family Ranch in December 2001, riding on John Deere ATV. Photo ID #803-089 – Roll B – Negative # 1.

35. View of William D. Ruckelshaus's family vacationing at Kellogg Family Ranch in December 2001. Playing broom hockey on the house pond. Photo ID #803-089 – Roll B – Negative # 9.

36. View of William D. Ruckelshaus's family vacationing at Kellogg Family Ranch in December 2001. Photo of one young man playing broom hockey on the house pond. View of area to be impacted by potential reroute is in the background. Photo ID #803-089 – Roll B – Negative # 12.

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Public Comments

Kuehn, Ginny -KC-7

From: Hicks, Stephanie [shicks@wkg.com]
Sent: Friday, March 22, 2002 12:04 PM
To: 'nawittpenn@bpa.gov'; 'comment@bpa.gov'
Cc: Harrel, Arley; 'gaylord@frazierco.com'; Hicks, Stephanie; Lygren, Nancy
Subject: Shultz-Hanford Transmission Line Project - DOE/EIS 0325: Comments on DEIS

WKG-#1264174-v2-RECOVERED_Kell... WKG-#1264318-v1-Index_to_Comme...

March 22, 2002

On behalf of the Kellogg Family Ranch, attached please find: (1) Comments on the referenced DEIS; and (2) Index of Attachments supporting Kellogg Family Ranch Comments on DEIS. Hard copies of these documents are being faxed to you simultaneously. Supporting atttachments, along with the documents attached to this email are also being sent via Federal Express for delivery to you on March 25, 2002.

Thank you for your consideration of these comments.

P. Arley Harrel
Stephanie M. Hicks

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<<WKG-#1264174-v2-RECOVERED_Kellogg_Formal_Comment_Letter_to_BPA.DOC>>
<<WKG-#1264318-v1-Index_to_Comments_to_DEIS.DOC>>

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RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SH DEIS - 018
RECEIPT DATE:
MAR 25 2002

LOWER COLUMBIA AUDUBON SOCIETY
9016 Sunset Trail
Pasco, Washington 99301

March 24, 2002

U.S. Department of Energy
Bonneville Power Administration
Attn: Communications-KC-7
P.O. Box 12999
Portland, Oregon 97212

Dear Sir / Madam:

I am writing to comment on the Schultz-Hanford Area Transmission Line Project Draft environmental Impact Statement (DOE/EIS-0325).

18-1 First of all I would like to say that I was highly disappointed in the Draft EIS Summary. I have been reviewing EIS's since 1978 and without a doubt this is the worst EIS summary I have ever reviewed. The project location descriptions were confusing at best. I am absolutely appalled that you did not even include a map of the alternative routes. I do not believe you have provided the public with adequate information, in an easily understandable format from which to comment on this project.

18-2 I am also disappointed that you have not scheduled public hearings on this project. Your public meetings were simply opportunities for the public to review your static displays and not an opportunity for public dialogue so essential in the review process.

18-3 In short, I do not believe you have met the requirements for public involvement in the decision process for this project.

18-4 I recommend that the project follow existing transmission lines, we therefore recommend using Segment B-North, and D or E. We recommend that the transmission lines be constructed within 200 feet of existing lines not 1200 feet. If you construct the lines at a distance greater than 200 feet, your are establishing a new transmission corridor and not utilizing the existing transmission corridor.

18-5 We are particularly concerned that disturbance to the Hanford Reach National Monument is held to an absolute minimum. We therefore recommend that you replace the existing single-circuit with double-circuit towers when crossing the Monument. We note that you recommend using these double-circuit towers when crossing irrigated areas and believe the same technology can be used to minimize disturbance when crossing the Monument's fragile environment.

Public Comments

18-5 cont. Whatever route is chosen will involve substantial damage to the wildlife, native plants and habitat the transmission lines cross. We believe the Bonneville Power Administration must mitigate this damage and the best place to start is by purchasing the McCorder Ranch, adjacent to the Hanford Reach National Monument. This property contains excellent shrub-steppe habitat and provides an outstanding opportunity for managing the Rattlesnake Mountain elk heard. The acquisition of this property is supported by sportsman, environmentalist, state and local government and the U.S. Fish & Wildlife Service. It is truly a win/win proposal that provides real mitigation for some of the disturbance constructing and maintaining a transmission line will cause.

Thank you for this opportunity to comment on the draft EIS.

Sincerely,

Richard J. Leaumont

Page 1 of 1

Kuehn, Ginny -KC-7

From: Rick Leaumont [leaumont@owt.com]
Sent: Sunday, March 24, 2002 8:56 PM
To: comment@bpa.gov
Cc: Rick Leaumont
Subject: Schultz-Hanford draft EIS comments

Bonneville Power Administration:

I am attaching my comments on the Schultz-Hanford Area Transmission Line Project draft EIS.

Thank you!

Rick Leaumont
509-545-6115

3/25/02

Public Comments

BARBARA J. RHOADS-WEAVER
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weaverb@seattleu.edu

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-019
RECEIPT DATE: MAR 25 2002

March 22, 2002

Bonneville Power Administration
Lou Driessen, Project Manager
Communications-KC-7
P.O. Box 12999
Portland, OR 97212

Sent Via Email: *comment@bpa.gov*

RE: Schultz-Hanford Area Transmission Line Project Draft EIS DOE/EIS-0325

Dear Mr. Driessen,

Please include my comment letter in the official record and address the concerns raised in the final Environmental Impact Statement (EIS). I have several comments regarding the adequacy of the draft EIS for the proposed Schultz-Hanford Area Transmission Line Project. The following concerns are set out in more detail below: (1) the narrow articulation of the action's or project's purpose and need that forecloses substantive alternatives to the proposed action/project; (2) the lack of consideration of reasonable alternatives to achieve the action's or project's actual purpose and need; (3) the narrow scope of the EIS that does not include the effects of connected, cumulative, and similar actions/projects; and (4) the lack of consideration of all reasonably foreseeable direct, indirect, and cumulative impacts.

Purpose and Need:

19-1 In section 1.1 of the draft EIS it is stated that the "...BPA needs to increase transmission capacity **north of Hanford**..." (emphasis in original). However, it is apparent based on the previous paragraph of section 1.1. that the real need is to increase system reliability in central Washington to prevent outages, brownouts and blackouts. In addition, it is clear that the real need is to increase system reliability because in section 1.2 the first bullet articulating the action's/project's purpose is to "[m]aintain transmission system reliability."

19-2 Federal agencies, such as the BPA, may not define the purpose and need so narrowly that only one alternative is reasonable. By defining the need as to increase transmission capacity north of Hanford, the BPA has circumvented the purpose of an EIS under NEPA and made only one alternative (building more transmission lines) the only reasonable alternative to meet its stated need (increased transmission capacity). *See* 40 C.F.R. 1502.1, primary purpose of an EIS is to serve as an action-forcing device and it "*shall* inform decision-makers and the public of reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." (emphasis added).

19-3 Whether an increase in transmission capacity (building more transmission lines) is the best

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Comments Draft EIS DOE/EIS-0325 (Schultz-Hanford Area Transmission Line Project)
March 22, 2002
Page 2 of 5

19-3 cont. alternative to meet BPA's actual need for increased system reliability in central Washington is a policy decision that requires major federal action to implement. NEPA mandates that the BPA use the rule of reason to look at reasonable alternatives and their impacts before deciding to make an irreversible commitment of resources to build more transmission lines

Reasonable Alternatives:

19-4 Other than the "No Action" alternative, all of the alternatives detailed in and considered by the draft EIS are to construct an additional transmission line through central Washington. The consideration of alternative transmission lines to the preferred transmission line may satisfy NEPA's requirement that the government include a detailed statement of alternatives to the proposed action in its recommendation or report. NEPA §102 (C)(iii) codified at 42 U.S.C. 4332(C)(iii). However, because the actual need and purpose is not to build more transmission lines but to increase system reliability, it is more likely that the rule of reason would require the BPA to detail and consider all alternatives which are technically, economically, and environmentally feasible to meet the actual need and purpose of the action/project.

19-5 There are at least two alternatives that I can think of which are reasonable because they are technically, economically, and environmentally feasible: distributed renewable energy generation and conservation. Distributed renewable energy generation is single units or clusters of renewable energy generation units that are interconnected to the distribution lines and serving on-site loads. Conservation is the decrease of load demand by changing behavior and investing in energy efficient appliances and practices. Both distributed renewable energy generation and conservation have the potential to at least partially meet BPA's need and purpose to increase system reliability in central Washington. 19-6 In addition, there is reliable evidence that deserves further consideration that suggests both distributed renewable energy generation and conservation can completely meet BPA's need to increase system reliability in central Washington. Therefore, the draft EIS is inadequate because of its failure to detail these reasonable alternatives so that the decision maker may consider them before making a policy decision that requires major federal action, which affects man and the environment. *See* 40 C.F.R. 1502.14(a), agencies shall "[r]igorously explore and objectively evaluate all reasonable alternatives…."

In an effort to assist the BPA in producing an adequate final EIS (by complying with NEPA's mandates under §102 (C)(iii) and (E)), a discussion of the feasibility of distributed renewable energy generation and conservation to meet BPA's need and purpose follows. According to the background information provided in the draft EIS (section 1.3), during the spring run-off, water is spilled over dams in the Lower Snake and Columbia Rivers to help transport juvenile salmon. The energy generation lost by spilling water over the dams for salmon needs to be replaced to meet load demands. Currently, it appears that the dams along the mid and upper Columbia River increase energy generation to make up for the lost generation due to spilling water for salmon transportation on the lower Snake and Columbia Rivers. BPA wants to maintain system 19-7 reliability by increasing the transmission line capacity in central Washington. However, it is also possible to make up for the lost generation due to spilling water for salmon transportation by increasing the amount of distributed renewable energy generation near the Lower Snake and Columbia Rivers or near the area where it will ultimately be used (Oregon and California, i.e. the

Public Comments

Comments Draft EIS DOE/EIS-0325 (Schultz-Hanford Area Transmission Line Project)
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19-7 cont. Southern Intertie).

19-8 One feasible distributed renewable energy source is wind. The resource maps produced by Northwest Sustainable Energy for Economic Development (NWSEED) with funds from DOE and BPA show that one distributed renewable resource could make up for the energy lost by spilling water over the dams for salmon. *See* www.windpowermaps.org. The maps were validated by NREL. Although using distributed wind energy generation to meet BPA's need and purpose may be outside the jurisdiction of BPA, it must be considered in the EIS to provide decision makers and the public information on all reasonable alternatives. *See Natural Resources Defense Council, Inc. v. Morton*, 458 F.2d 827 (D.C. Cir. 1972); 40 C.F.R. 1502.14(c).

19-9 Distributed wind generation certainly meets the purposes set out in section 1.2 of the draft EIS. It would maintain the transmission system reliability in central Washington because it would not be using the transmission lines in central Washington. It optimizes the transmission system usage by achieving the same goals without having to build more lines. It minimizes environmental impacts because not only does it prevent the need for new large transmission lines, but it also preserves water for salmon and has other beneficial effects (discussed below in the section on impacts) without many negative environmental impacts. Costs are minimized when the environmental costs (externalities) are considered in the whole picture. Although the cost of energy production may be less for hydro than wind, there is a good possibility that the cost of transportation (building new transmission lines) will make the current preferred option more expensive than the alternative of distributed wind generation, which does not require BPA to build a new transmission line across central Washington. And finally, because wind turbines do not take long to install, it is possible for BPA to meet an energization date of late 2004 with distributed wind generation.

19-10 Although conservation was not considered a reasonable alternative that needed to be considered in 1978, it is clear that conservation is a very reasonable alternative in 2002. *See Vermont Yankee Nuclear Power Corp. v. Natural Resources Defense Council, Inc.*, 435 U.S. 519 (1978). Conservation was so effective in reducing the demand for energy (load) during the "energy crisis of 2001" that many utilities in the northwest have ironically applied for rate increases to cover the lost income due to a drop in demand. Therefore, more information should be provided in the EIS either detailing the alternative of conservation or at least explaining why it is not considered as an alternative. 40 C.F.R. 1502.14(a), "…for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated."

19-11 A policy decision needs to be made, and it appears there are two choices, only one of which is detailed in the draft EIS: whether (1) to invest in distributed renewable generation and/or conservation to make up for lost generation due to spilling water for salmon and to maintain system reliability in central Washington; or (2) to invest in more transmission lines to move electricity from northern Washington through central Washington to Oregon and northern California. Before a decision can be made the EIS must provide details for each of the alternatives.

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Scope

19-12 Section 1.8 describes other projects in the area. The "other projects in the area" all fall into the categories of connected actions, cumulative actions, or similar actions. 40 C.F.R. 1508.25(a)(1)-(3). Therefore, the other actions should be included in the scope of the EIS. *Id.* The other projects in the area include another new transmission line (similar action), two natural gas combined-cycle combustion turbines (connected and/or cumulative actions), and four wind farms (connected and/or cumulative actions). The new transmission lines and centralized power generation plants (natural gas or wind) are interdependent parts of a larger action to meet the regional energy needs with more centralized plants and transmission lines as opposed to distributed renewable sources and conservation. Therefore, unless there was a Programmatic EIS that was not referenced in the draft EIS, all of the actions need to be included in the scope of the EIS so that the policy makers will have all of the information in one document before deciding which course of action to take. *See Thomas v. Peterson*, 753 F.2d 754 (9th Cir. 1985).

Environmental Consequences

Section 4 of the draft EIS details the direct, indirect, and cumulative impacts or effects of the proposed action and its alternatives on the environment. The following discussion points out impacts or effects that have not been detailed which make the current draft EIS inadequate. I will address the inadequacies in the order in which their omissions appear in the draft EIS.

19-13 First, are the direct and cumulative impacts due to the increased use of herbicide spray and vegetation control near water crossings. Section 2.29 discusses the on going maintenance needed for the action/project. It includes vegetation control near water crossings and the use of herbicides in the area of substations. Section 4.1 discusses the impacts and effects on water resources, soils, and geology. There are details about the effects of vegetation control such as the loss of shade and erosion. However, there is no discussion of the impact, if any that the increased use of herbicides would have on the already stressed waterways (section 3.1.2.1 discusses the current water quality of the affected areas).

19-14 Second, are the direct, indirect, and cumulative impacts to socioeconomics in the affected areas (section 4.7). In particular is section 4.7.3 on the economy and industry. While the impacts of constructing a new transmission line and no action are considered, the lack of discussion for the alternative distributed renewable generation is missing. Unlike construction projects that create little economic value in the way of local jobs or are of value for only a short duration of time, distributed renewable generation has the potential to create new jobs and/or sources of income in the area and benefit the local economy and industry for a long duration of time.

19-15 Third, are the direct, indirect, and cumulative impacts to public safety and health in the affected areas (section 4.11). There are several public safety and health concerns not discussed in this section. For example there is not a section on the increased risk to public health created by the increased pollution that comes with the construction of additional natural-gas power plants. As discussed earlier there are two new natural gas projects in the area being considered as well. The gas plants would not be viable without additional transmission lines, therefore, the final EIS should include a discussion of the increased risk to public health created by the gas plants that will result if a new transmission line is constructed.

Public Comments

Comments Draft EIS DOE/EIS-0325 (Schultz-Hanford Area Transmission Line Project)
March 22, 2002
Page 5 of 5

19-16 Another public health and safety concern that is not addressed is the possibility of terrorism. Although terrorism may not have been a reasonable or foreseeable impact in the past, it certainly should be considered a realistic and foreseeable impact now. Many of the northwest dams were the targets of terrorist plots according the local news sources quoting FBI reports. The BPA may wish to take a page out of the Defense Departments book (it created the internet and world wide web because of the vulnerabilities of a centralized computer and communication system). Centralized power plants and large transmission lines are easy targets for terrorist because if they go down the disruption and potential effect on large populations is enormous. Whereas, distributed renewable energy sources make difficult targets and have less of impact if one is "taken out" for whatever reason. Therefore, the EIS needs a section on national security and public health and safety impacts of centralized energy plants with large transmission lines versus the impacts of distributed renewable energy sources and conservation. While discussing national security and its impacts on public safety and health the EIS should also contain detailed information for the policy makers and the public on the impacts of maintaining our dependence on fossil fuels as opposed to the nation security impacts of reliance on distributed renewable energy sources.

19-17 Fourth, are the direct, indirect, and cumulative impacts on air quality (section 4.12). The discussion in section 4.12 does not consider the cumulative impacts on air quality of more transmission lines. More transmission lines necessarily means more centralized power generation. Included in the new sources of centralized power generation are at least two natural gas plants. Natural gas may be "cleaner" than other fossil fuels. However, it still produces air pollution that should be detailed in this section of the EIS.

Summary
In conclusion, the final EIS should (1) accurately articulate the need and purpose of the proposed action, which is to increase system reliability in central Washington; (2) provide the public and policy makers with detailed information on alternatives such as distributed renewable energy generation and conservation; (3) provide the public and policy makers with detailed information on the impacts of all of the connected, cumulative and similar actions that have already been identified; and (4) provide the public and policy makers with additional information on reasonably foreseeable impacts to water resources, socioeconomics, public health and safety, and air quality.

Sincerely yours,

[emailed without signature to avoid delay]

Barbara J. Rhoads-Weaver

Kuehn, Ginny -KC-7

From: Barb Rhoads-Weaver [weaverb@seattleu.edu]
Sent: Monday, March 25, 2002 11:03 AM
To: comment@bpa.gov
Subject: Schultz-Hanford Transmission Line Draft EIS comment letter

EIS comment letter.doc

Attached please find my comments on the draft EIS for the Schultz-Hanford Transmission Line Project.

Barb Rhoads-Weaver
2724 S. Elmwood Place
Seattle, WA 98144
206-325-7402 / cell 206-755-9444
hbrw@drizzle.com

1

Public Comments

March 21, 2002

Department of Energy
Public Affairs Officer – KC – 7
ATTN: Mr. Lou Dressen
P.O. Box 12999
Portland, OR 97212

Subj: Draft Environmental Impact Statement for the Shultz-Hanford Area Transmission Line Project (DEIS).

Dear Mr. Dressen:

The Nature Conservancy (Conservancy) welcomes the opportunity to review and comment upon a proposed 500-kilovolt transmission line construction project affecting areas of biological significance identified as priority conservation action sites by the Conservancy. The project's purpose, to address the increasing demands on the regional power supply and distribution system, is well articulated. Based on the alternatives presented in the DEIS, with the caveat set forth in the comments below, we concur with the selection of Alternative 2 as the preferred alternative.

Introduction and Background

Key areas of interest to us in the corridor delineated in the preferred alternative include the Hanford Reach National Monument and the Yakima Training Center. The Conservancy's identification of these priority areas comes in part from the Conservancy's Columbia Plateau Ecoregional assessment process. Based upon principles of conservation biology, our planning model yields a set of conservation areas representing biological diversity at varying biological and spatial scales. In addition to the Hanford Monument and Yakima Training Center, private ownerships and other federal ownerships characterized by intact shrub-steppe communities are also significant sources of remnant high quality plant communities. Appendix E of the DEIS notes the presence of these element occurrences in several segments of the proposed corridor.

In addition to much of the proposed route's importance from an ecoregional planning perspective, results from the Conservancy's biodiversity inventory of the Hanford site provides strong justification for expanded protection of this area. In 1992 the U.S. Department of Energy (DOE) and the Conservancy entered into a Memorandum of Understanding that called for a cooperative and coordinated inventory of plants, animals and ecologically significant areas at the Hanford Site. This study is noteworthy in its discovery of plant and insect species new to science. The following excerpt from the executive summary underscores the importance of this area within the Columbia Plateau ecoregion (*Biodiversity Inventory and Analysis of the Hanford Site*, TNC: 1999):

> Findings from the biodiversity inventory clearly demonstrate that the Hanford Site, including the Hanford Reach, is home to a spectacular, unduplicated and irreplaceable natural legacy. Within its mosaic of habitats, Hanford supports a wealth of relatively unaltered and increasingly uncommon native plant communities, the size and diversity of which is unmatched in the Columbia Basin. Not surprisingly, significant numbers of plants, insects, amphibians, reptiles, birds, and mammals, many of which are rare or declining in Washington, were found to be associated with or dependent on these habitats. In its present condition the Hanford Site is not only a refuge, but also a genetic bank for both the common and rare plants and animals that are integral components of the shrub-steppe and Columbia River ecosystems. From a conservation standpoint, the Hanford Site is a vital—and perhaps the single most important—link in preserving and sustaining the diverse plants and animals of the Columbia Basin Ecoregion.

The Yakima Training center is also a conservation priority for the Conservancy, within the constraints imposed by the mission needs of the Department of Defense. The Conservancy's report titled *Identifying and Preserving Biodiversity on a Regional Scale, the Role of the Yakima Training Center in Conserving Biodiversity in the Shrub-Steppe of Washington* (TNC, 1999) states that

> The YTC supports over 100,000 acres of high quality, native plant communities in seven major habitat types and more than 30 major cover types. Although many of these types are represented to a lesser degree on other public lands, the extent at the YTC of contiguous high quality, low elevation big sagebrush…is unique and of regional importance. The YTC supports 21 of the 77 rare plant taxa currently known in the region…Three taxa found on the YTC are not known elsewhere in Washington…

This report, based on extensive field research, remote sensing, literature review and expert opinion used a regional filter to reveal the significance of the remaining areas of unfragmented shrub-steppe to conservation of sensitive species and habitats. **20-1** It is surprising that the report is not listed as a reference in the DEIS, as it offers important data and management recommendations for habitat protection in the affected landscapes.

Comments

Given the exhaustively documented value of the region's remnant shrub-steppe environment, we would like to raise several points that emerge from the DEIS:

- **Line Separation**: One of the principles embedded in the DEIS is the ranking of perceived economic impacts to a single user group (agricultural producers) over the broader costs of environmental impacts to all user groups. This is made clear by the proposal to separate the lines throughout the preferred alternative with the exception of the eight miles located in an agricultural area. **20-2** The DEIS does not provide any justification for running a double circuit line utilizing the existing Right of Way (ROW) through an agricultural zone, while imposing the fiscal and ecological costs of constructing a separate single circuit transmission line and support facilities throughout the rest of the project. **20-3** There is no discussion or evidence of impact analysis by non-market valuation techniques of the loss of unique and imperiled genetic diversity and untrammeled remnant ecosystems versus the loss of agricultural ground. **20-4** Since it appears a double circuit line can be provided through a land use type that the DEIS acknowledges can still function within a transmission line ROW, there is no reason for the DEIS not to consider whether it can also be provided through sensitive habitat areas that cannot function once disturbed. **In particular, there should be consideration of a proposed alternative which offers the construction**

Public Comments

20-4 cont. **of a double circuit line through Hanford, which traverses a Monument land use designation of Preservation (DEIS pg 3-60, 5-13).**

20-5
- **Regional Cumulative Impacts**: This project represents only a small portion of the proposed expansion plans for meeting regional power demands. On page 1-6, the DEIS lists a number of other projects under consideration. Each will be undergoing separate analysis of impacts at the project scale. **This failure to consider all of these impacts in effect isolates each project and prevents analysis at a scale that would potentially yield a much different picture, with a different suite of solutions, than the default "sum of the parts' approach.** Actions taken at the project level to minimize impacts to a globally imperiled species, for instance, may not be sufficient if other remnant populations or element occurrences are going to be lost at other project sites.

20-6
- **Mitigation**: Related to selecting an appropriate scale to analyze impacts, defining a substantive mitigation strategy that accounts for the expansion of regional power production becomes critical. One of the most successful strategies for mitigating unavoidable impacts is to replace the loss through a replacement ratio. The mitigation strategies proposed in the DEIS relate to minimizing on-site construction impacts in ecologically sensitive areas. **With the exception of the offer to provide land replacement funding to owners of agricultural land (fair market value compensation), there is no strategy proposed to replace the loss of ecologically significant land.** Establishing a land bank to address both project-scale and regional impacts would serve as a substantive mitigation technique. A suitable site was in fact recommended to BPA for funding by the Northwest Power Planning Council in January, 2002. The site, identified as the Rattlesnake Slope Addition (Project Number 25020) abuts the Hanford Monument, and is central to the regional expansion area. This site is for sale by a landowner predisposed to seeing it placed in the public domain, and the transfer to public ownership is supported by local county commissioners, state legislators, and a broad spectrum of special interests.

20-7
- **Monitoring: The mitigation strategies proposed to offset the effects of constructing the project leave out any means for monitoring, oversight and enforcement in the case of non-performance.** The need for a credible monitoring plan becomes critical in areas where the DEIS identifies the downgrading of high impacts to moderate impacts through the use of mitigation techniques. An example is the case for impact to sage grouse. Construction of Segments A and B (YTC) is deemed a "high impact" but "with mitigation, construction of Segments A and B would cause a moderate impact to sage grouse (DEIS, pg 4-46)." Assuming this is a correct assumption (no scientific support offered in the DEIS), what methods are proposed to assure these mitigation techniques will occur? What methods are proposed to address the high impacts if the mitigation techniques are unsuccessful? What venues are proposed to seek compliance with the mitigation measures? Paragraph S.2.2.10 (DEIS pg S-8) describes a variety of ongoing maintenance measures ascribed to the preferred alternative, including structural repairs, vegetation

20-8

control and road maintenance, but nothing is included about monitoring or maintaining proposed mitigation actions.

Conclusion
Our conclusion in reviewing the DEIS is that an alternative making use of double circuits throughout the project area, with a subset alternative using double circuits through highly sensitive areas must be included for analysis. Mitigation measures that offer replacement value for agricultural loss but do not include replacement of lost habitat may fail to offset environmental impacts from the project. Lack of monitoring and adaptive management provisions for the proposed construction mitigation techniques also lead to potential failure to offset high environmental impacts. We agree that the no action alternative fails to address the pressures imposed by a growing regional population. Under the same pressure, protecting the remaining fraction of unique, vanishing habitats and genetic diversity becomes even more crucial.

Sincerely,

Elizabeth Bloomfield
South Central Washington Program Manager

Cc: Elliot Marks
David Weekes
Laura Smith
Alan Holt
Michael Powelson
Maggie Coon
Terry Cook
Len Barson
John Humke
Karen Berky

Public Comments

Kuehn, Ginny -KC-7

From: Betsy Bloomfield [bbloomfield@tnc.org]
Sent: Monday, March 25, 2002 2:55 PM
To: comment@bpa.gov
Subject: Hanford Trans DEIS comments.doc

Hanford Trans DEIS comments.doc

ATTN: Mr. Lou Driessen, Project Manager

Please see attached comments on the Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement.

Elizabeth Bloomfield
South Central Washington Program Manager
208 E 6th Ave. Suite 200
Ellensurg, WA 98926
(509) 962-1333

1

LAW OFFICE OF
MARK A. CHMELEWSKI

March 22, 2002

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHOEIS-0021
RECEIPT DATE:
MAR 26 2002

Bonneville Power Administration (BPA)
Public Affairs Office - KC
PO Box # 12999
Portland, OR 97212

Re: Shultz-Hanford Area Transmission Line - EIS Comments

Sir/Madam:

I am **not** in favor of any new transmission mission lines in Kittitas County, Washington --- the traditional NIMBY (Not In My Back Yard) response. However, realizing that it most likely will occur, I generally favor the Preferred Alternative which is **north** of the existing lines through Kittitas County.

I am strongly **not** in favor of the potential reroute in Segment A (Colockum Pass S - Section 6 of SW/SE Quad). This is the Fairview District at the base of Colockum and Cooke Canyons. From my residence on Gage Road, this is a Visually Sensitive Viewpoint.

21-1 It is my understanding that this portion of the reroute is part of a Yakama Nation allotment. I question if there have been any cultural uses or hunting uses of that property in recent memory which warrants a reroute. Have any Native American traditional cultural practices ever been documented for this piece of property?

21-2 It is also my understanding that BPA currently holds an easement for this allotment and is currently negotiating to purchase this piece of property from the Yakama Nation through the Bureau of Indian Affairs (BIA). I strongly urge BPA to work quickly and fairly with the BIA to purchase this property to avoid a costly and lengthy legal challenge to a reroute in Segment A.

21-3 If BPA refuses or can not purchase the needed property from BIA, why not double circuit this short distance to avoid a reroute in Segment A? It is clearly a cheaper and more efficient alternative. I was told by BPA representatives at a recent public hearing that the entire distance of the Schultz-Hanford reroute is 60 miles. I was also told that BPA is double circuiting at least a 9 mile section of the reroute to accommodate agricultural concerns. If BPA is willing to double circuit for apple trees shouldn't the same concession be made for less than a 1 mile portion to accommodate human and environmental concerns?

Public Comments

21-4 My final concerns deal with the Draft Environmental Impact Statement (DOE/EIS-0325). Were any walkthroughs or field evaluations done specifically in the reroute of Segment A? The Fish and Wildlife Resource Report, Appendix F, page 4 from 01-17-02, indicates that **only one field visit** took place in February 2001. One day of one season is not representative of complexities of an environment.

21-5 My largest concern is with the EIS preparers. The list includes Ph. Ds, authors, Project Managers, urban designers, writers, editors, planning consultants, technical editors, visual information specialist, landscape architects, project engineers, contract managers and a realty specialist. Most notably absent is input from any area landowners, local hunters, local fisherman, State hydrologists, State Wildlife Officers, Fish and Game Department Agents, DNR agents, BLM agents, DOD representatives or State biologists. These agencies were contacted, but to what degree? Why weren't they part of the preparation of the EIS?

21-6 This area could be prime agricultural farm land and **is** prime wildlife habitat. As a landowner and year round resident of adjacent property I have seen bobcat, cougar, a migrating elk herd, deer, skunk, porcupine, racoon, coyotes, vole, chipmunk, 3-4 species of owl, 3-4 species of hawks, grouse, quail, pheasant, curlews, 3 types of trout in Cooke Creek and migrating American Bald Eagles in this immediate area. This area of shrub-steppe habitat has been designated a Priority Habitat by the State of Washington. Consequently I believe that your draft EIS needs additional work and input from local residents and professionals who know the immediate area and the visual, geological, and wildlife values that be lost with a reroute through Segment A.

Accordingly, I strongly urge and advise you to avoid a reroute through Segment A.

If you have any questions or concerns, please contact me. Thank you for your time and attention in this matter.

Respectfully,

Mark A. Chmelewski

B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement

Comment Form

1. What are your comments on the Preferred Alternative?

2. What are your comments on other alternatives?

3. I need more information about

4. Additional comments

MARK A. CHMELEWSKI
ATTORNEY AT LAW
410 NORTH PINE
ELLENSBURG, WA 98926
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(509) 933-1FAX (1329)
mac1law@eburg.com

☒ Please put me on your project mailing list. (You are already on the mail list if you have received mailed notice.)

☐ Please remove me from the project mailing list.

Name MARK A. CHMELEWSKI

Address 410 N. PINE ST. Ellensburg, WA 98926

Please send comments by March 25, 2002 to:

Bonneville Power Administration
Public Affairs Office - KC
P.O. Box 12999
Portland, OR 97212

Public Comments

Williams, Kastner & Gibbs PLLC — Law Firm

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March 25, 2002

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-032 14763.101
RECEIPT DATE:
MAR 26 2002

Bonneville Power Administration
Communications – KC-7
P.O. Box 12999
Portland, OR 97212

Re: Schultz-Hanford Area Transmission Line Project – DOE/EIS 0325
CORRECTIONS: Comments on Draft Environmental Impact Statement

Dear Sir or Madam:

With respect to our comment letter and attachments dated March 22, 2002, submitted on behalf of Cooke Coleman LLC and Gaylord Kellogg, aka the "Kellogg Family Ranch," with respect to the referenced Project and DEIS, please consider the following corrections:

22-1

1. Attachment numbers 2 and 3, which depict an aerial photograph of overview of Kellogg Family Ranch (dated May 11, 2002), and an aerial photograph of springs of Kellogg Family Ranch (dated May 11, 2001), respectively, incorrectly illustrate the boundaries of property owned by Chmelewski/Vancil. We will be submitting revised versions of these attachments for your consideration as soon as possible.

2. The last sentence in the last paragraph on page 16 of our comment letter should be replaced with the following: "Actual study of the potential impact of the property value of the Kellogg Family Ranch would likely show a clear decrease in property value with two transmission lines crossing approximately .6 of a mile of the property fronting on four county roads: Coleman Creek Road, Cooke Canyon Road, Gage Road, and Colockum Road."

1265225.1 — Seattle Tacoma

03/25/02 MON 17:43 FAX 206 628 6611

Bonneville Power Administration
March 25, 2002
Page 2

Thank you for your consideration of these corrections. Please contact us if you have any questions.

Very truly yours,

WILLIAMS, KASTNER & GIBBS PLLC

P. Arley Harrel

P. Arley Harrel
Stephanie M. Hicks
Attorneys at Law

Enclosures
cc: Clients
Nancy Wittpenn, Environmental Lead
Carol Borgstrom, Director, Office of NEPA Oversight
Environmental Protection Agency, Attention Office of Federal Activities
John Iani, Regional Administrator, Environmental Protection Agency, Region 10

1265225.1

Public Comments

03/25/02 MON 17:41 FAX 206 628 6611 ☑001

Williams, Kastner & Gibbs PLLC

LAW FIRM

Two Union Square
601 Union Street, Suite 4100
Seattle, Washington 98101-2380
P.O. Box 21926
Seattle, Washington 98111-3926
Telephone (206) 628-6600
FAX (206) 628-6611

FAX Cover Sheet

Multi-Party Transmittal

Date: March 25, 2002 *File No.* 14763.101

File Name: Kellogg

____3____ pages, which includes this cover sheet, are being sent to you. Our FAX telephone number is (206) 628-6611. If for some reason you do not receive all of the pages or transmission is not clear, please call our FAX operator at (206) 233-2920.

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To:	Company:	FAX No:	Telephone No:
Office of Federal Activities	Environmental Protection Agency	1-202-564-0070	1-202-564-2400
Nancy Wittpenn	Bonneville Power Administration	1-503-230-5699	1-503 230-3297
Carol Borgstrom	U.S. Dept. of Energy	1-202-586-7031	1-202-586-4600
John Iani	Environmental Protection Agency	206-553-0149	206 553-1200
BPA Communications – KC-7	Bonneville Power Administration	1-503-230-3285	1-800-622-4519

Attached please our letter dated March 25, 2002, document number 1265225.

Arley Harrel

From P. Arley Harrel
Aharrel wkg com
206-628-6625

HARD COPY: X TO FOLLOW ☐ RETAINED

Williams, Kastner & Gibbs PLLC

1265213.1

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Spokane District
Wenatchee Field Office
915 Walla Walla Avenue
Wenatchee, Washington 98801

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-023
RECEIPT DATE:
MAR 27 2002

IN REPLY REFER TO:
1793, 2800 (134)

March 25, 2002

Lou Driessen, Project Manager
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

Dear Mr. Dreissen:

This is sent to provide comments on the draft EIS for the Schultz-Hanford Area Transmission Line Project (DOE/EIS-0325). The Bureau of Land Management is a **formal cooperator** for this EIS.

23-1

Under the preferred alternative (Alternative 2), BLM public lands would be crossed by Segments A, B and D. Of these segments, BLM has special concerns over possible impacts to public lands located in the west end of the Saddle Mountains (Segment D). From previous discussions and correspondence, BLM was of the understanding that BPA would strive to double circuit the existing transmission line in this segment in order to minimize impacts. However, the DEIS states that double-circuiting of Segment D is only planned for the portion of route that begins nine miles south of the Vantage substation, and continuing south for eight miles across irrigated agricultural lands. This would mean that an entirely new powerline and ancillary access roads would be constructed across BLM lands in the Saddle Mountains, the most rugged portion of the preferred alternative. Because of the resource values present on these lands, the BLM has reservations about this plan, and requests that the preferred alternative in the final EIS be written to consider double-circuiting the portion of the existing powerline crossing BLM lands on this segment.

Additionally, BLM has the following concerns or comments on the resource analysis contained in the DEIS:

23-2

1. We note that resource inventories *have not* been completed on the public lands proposed to be crossed by the project. Included are Class III archaeological inventories, rare plant inventories, and sensitive wildlife species inventories. Consequently, both the affected environment and environmental consequences chapters of the DEIS are inadequate. Prior to the completion of the Final EIS, these inventories *must* be completed and the reports provided to BLM for review. In order for the resource inventories to have validity, it is essential that rare plant and sensitive species surveys be undertaken at the correct time of the year. For example, Washington ground squirrels are active from late January or early

COPY

Public Comments

23-2 cont. February into June. Bald eagles are present from late October through March. The BLM also needs to receive copies of the Biological Assessment(s) prepared for the project.

23-3 In order for BLM to comply with Native American consultation requirements, BLM needs to share the completed archaeological inventories with the affected tribes before the final EIS is written. This is so the tribes may have an opportunity to provide input into the analysis.

23-4

2. Certain table headings and discussion terms in the rare plants portion of Chapter 3 (section 3.4.4.; page 3-26+), and Appendix E need to be modified in order to read correctly. The descriptor "**BLM special status species**" is more appropriate for table 3.4-7, and the heading and discussion under 3.4.4.3 (the DEIS uses "BLM sensitive species"). Terms used in Appendix E, Table 6 and the attendant discussion should be likewise changed. "BLM sensitive species" are specific species that are designated by respective BLM State Directors, and are generally state threatened or endangered species. Throughout the EIS document and appendices, the term "BLM sensitive species" should be replaced with "**BLM special status species.**"

23-5

3. Table 3.7-2 (page 3-51) incorrectly states that no BLM ownership exists on the B-north and B-south routes. In reality, from your alignment maps it appears that BLM lands would be crossed by Segment B in the SE¼ of section 12, T.16N., R.21E., section 28, T.16N., R.22E., and section 20, T.16N., R.23E. All except the portion of section 20 east of the former Milwaukee railroad bed are within the boundary of the Army's Yakima Training Center. However, the Army has not yet received a formal withdrawal on these lands and they remain under BLM jurisdiction. BLM would ultimately issue any right-of-way across these parcels (subject to Army concurrence). Because the table is incorrect, the discussion under 3.7.4.2 (page 3-58) needs to be revised.

23-6

4. In section 5.5.1.1 (page 5-4), the text incorrectly states that the BLM Spokane District is divided into 13 management areas. Through a 1992 resource management plan (RMP) amendment, BLM reduced the number of management areas from 13 to 10. Table 5.5-1 on page 5-5 also needs to be changed: Segment B should read "Saddle Mountains," Segment C, "Scattered Tracts," and Segment D, "Saddle Mountains and Scattered Tracts."

23-7

5. In order to permit meaningful review of the proposal, higher detail maps need to be included in the document. The maps provided with the document are not of sufficient scale or detail. We recommend additional maps that have a scale of at least 1:50,000. These maps should include contour lines and proposed tower and access road locations, if possible.

Please note that the BLM is not completely finished in its review of the DEIS. We will provide additional comments to BPA by April 2, 2002.

23-8 Prior to the completion of the final EIS, it is essential that a meeting be scheduled between BPA and BLM to discuss the project. We also need to discuss the BLM's realty requirements for authorizing the project. The BPA will need to file both a right-of-way application and a plan of development with BLM.

If clarification is needed regarding the above comments, please contact Kathy Helm at 509/536-1200.

Sincerely,

James F. Fisher
Field Manager

cc: Kathy Helm, Spokane District Office
Eric Stone, Oregon/Washington State Office (OR 933)

Public Comments

Washington State
Department of Transportation
Douglas B. MacDonald
Secretary of Transportation

South Central Region
2809 Rudkin Road, Union Gap
P.O. Box 12560
Yakima, WA 98909-2560

509-577-1600
TTY: 1-800-833-6388
www.wsdot.wa.gov

March 25, 2002

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-024
RECEIPT DATE: MAR 27 2002

Bonneville Power Administration
Communications – KC-7
P. O. Box 12999
Portland, OR 97212-0999

Attention: Lou Driessen, Project Manager

Subject: Department of Energy, Bonneville Power Administration
TNN-TPP-3, Schultz – Hanford Area Transmission Line Project
(Associated with WSDOT letter dated January 25, 2001)

24-1 We have reviewed the proposed Draft Environmental Impact Statement (DEIS). WSDOT previously submitted comments concerning this proposal in a letter dated January 25, 2001. That letter identified concerns we have, and any permits that would be required. We have no additional comments.

Thank you for the opportunity to review and comment on this proposed project. If you have any questions concerning our comments, please contact John Gruber at (509) 577-1636.

Sincerely,

Troy A. Suing, P.E.
Regional Planning Engineer

TAS: rh/jjg

cc: File #6, U.S. & State Agencies (2000)
Barry Peterson, WSDOT-North Central Region Utilities
Lionel Heinold, WSDOT-North Central Region, Area 2 Maint. Superintendent
Jamil Anabtawi, Utilities Engineer
Terry Kukes, Area 1 Maintenance Superintendent
Don Wherry, Area 2 Maintenance Superintendent
Tom Root, Area 3 Maintenance Superintendent

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Williams, Kastner & Gibbs PLLC

Law Firm

P. Arley Harrel
Attorney at Law
(206) 628-6625
aharrel@wkg.com

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601 Union Street, Suite 4100
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Telephone (206) 628-6600
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March 26, 2002

RECEIVED BY BPA
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LOG#: SHDEIS-025
RECEIPT DATE: MAR 2 ? 2002

4763.101

Bonneville Power Administration
Communications – KC-7
P.O. Box 12999
Portland, OR 97212

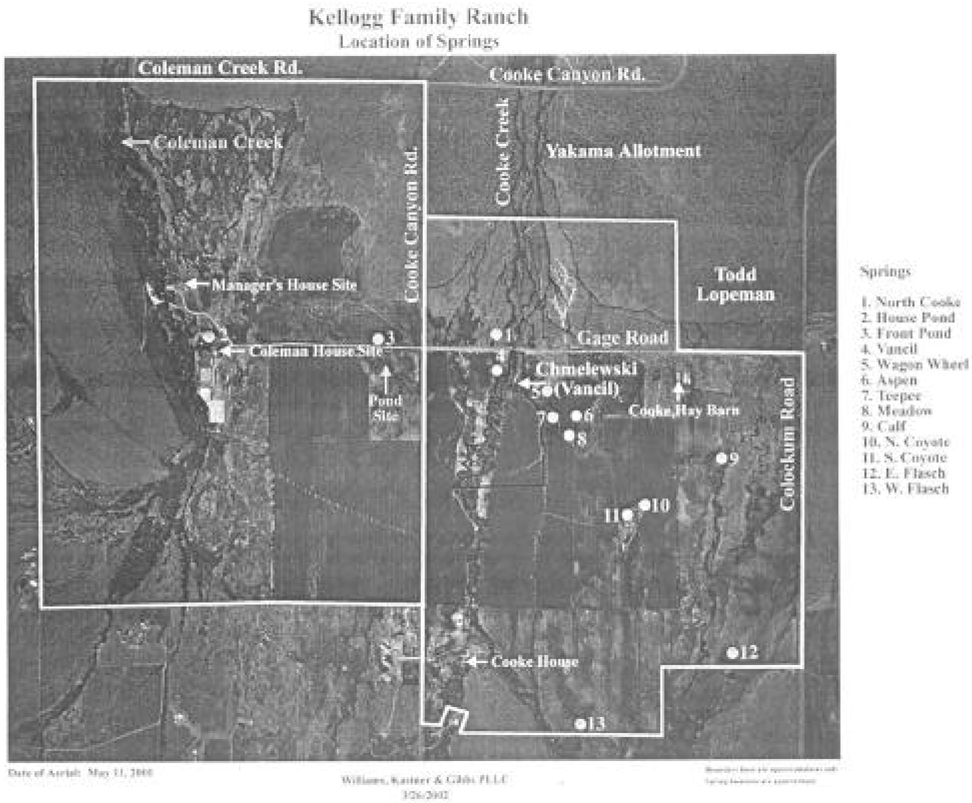
Re: Schultz-Hanford Area Transmission Line Project – DOE/EIS 0325
CORRECTIONS: Comments on Draft Environmental Impact Statement
Attachments 2 and 3: aerial photographs of overview and springs

Dear Sir or Madam:

25-1 This is a follow up to our letter of March 25, 2002 concerning corrections to our comment letter and attachments dated March 22, 2002, submitted on behalf of Cooke Coleman LLC and Gaylord Kellogg, a/k/a the "Kellogg Family Ranch," with respect to the referenced Project and DEIS. We enclose revised Attachments number 2 and 3. Attachment numbers 2 and 3 depict an aerial photograph of overview of Kellogg Family Ranch (dated May 11, 2002), and an aerial photograph of springs of Kellogg Family Ranch (dated May 11, 2001), respectively. The substitute Attachments correct the illustration of the approximate boundaries of property shown as Chmelewski/Vancil. The substitute Attachments have been dated at the bottom as March 26, 2002.

1265429.1

Seattle
Tacoma



Bonneville Power Administration
March 26, 2002
Page 2

Thank you for your consideration of these corrected Attachments. Please contact us if you have any questions.

Very truly yours,

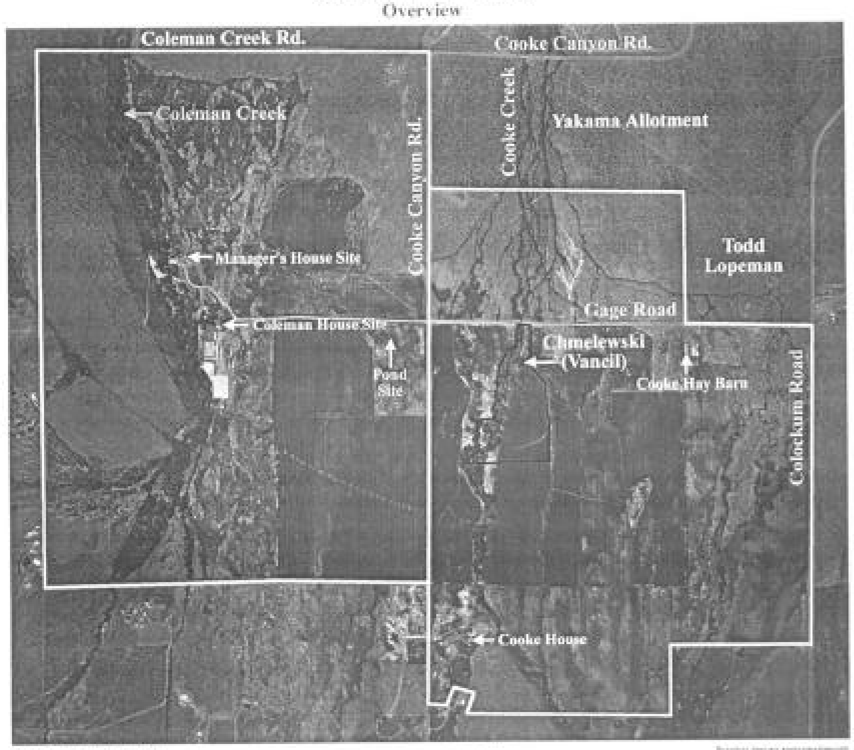
WILLIAMS, KASTNER & GIBBS PLLC

P. Arley Harrel

P. Arley Harrel
Attorneys at Law

Enclosures
cc: Clients
Nancy Wittpenn, Environmental Lead
Carol Borgstrom, Director, Office of NEPA Oversight
Environmental Protection Agency, Attention Office of Federal Activities
John Iani, Regional Administrator, Environmental Protection Agency, Region 10

Kellogg Family Ranch
Overview



Date of Aerial: May 11, 2001

Williams, Kastner & Gibbs PLLC
3/26/2002

John Iani, Regional Administrator U.S. Environmental Protection Agency, Region 10 1200 Sixth Avenue, EXA-124 Seattle, Washington 98101 Fax: 206-553-0149	X U. S. Mail __ Facsimile __ Email
Environmental Protection Agency Attention: Office of Federal Activities (A-104) 1200 Pennsylvania Ave. N.W. Washington, DC 20460 Fax: (202) 564-0070	X U. S. Mail __ Facsimile __ Email

The foregoing statement is made under penalty of perjury under the laws of the State of Washington and is true and correct.

Signed at Seattle, Washington, this 26th day of March, 2002.

Nancy Lygren

Nancy Lygren

1265438.1

Public Comments

DECLARATION OF SERVICE

I, Nancy Lygren, say:

1. I am now and at all times herein mentioned, a citizen of the United States and resident of the State of Washington, over the age of eighteen years, not a party to the above-captioned action, and competent to testify as a witness.

2. I am employed with the law firm of Williams, Kastner & Gibbs PLLC, 4100 Two Union Square, 601 Union Street, Seattle, Washington.

3. On March 26, 2002, we caused to be served the following documents in the manner indicated:

(1) Letter dated March 26, 2002, Re: Schultz-Hanford Area Transmission Line Project – DOE/EIS 0325, CORRECTIONS: Comments on Draft Environmental Impact Statement Attachments 2 and 3: aerial photographs of overview and springs directed to the Bonneville Power Administration, Communications – KC-7 (Document No. 1265429).

Bonneville Power Administration Communications – KC-7 905 NE 11th Avenue Portland, OR 97232 Fax: (503) 230-3285	_X_ U. S. Mail ___ Facsimile ___ Email
Nancy A. Wittpenn (KEC-4) Environmental Project Lead Bonneville Power Administration 905 NE 11th Avenue Portland, OR 97232 Fax: (503) 230-5699	_X_ U. S. Mail ___ Facsimile ___ Email
Carol Borgstrom, Director Office of NEPA oversight, EH-25 U.S. Dept. of Energy 1000 Independence Avenue S.W. Washington D.C. 20585 Fax: 202-586-7031	_X_ U. S. Mail ___ Facsimile ___ Email

1265438.1

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
500 NE Multnomah Street, Suite 356
Portland, Oregon 97232-2036

IN REPLY REFER TO:

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-026
RECEIPT DATE:
APR 03 2002

April 2, 2002

ER02/0150

Mr. Lou Driessen, Project Manager
Bonneville Power Administration
Communications - KC-7
P.O. Box 12999
Portland, Oregon

Subject: **COMMENTS** – Review of Draft Environmental Impact Statement for the Schultz-Hanford Area Transmission Line Project, DOE/EIS-0325, Kittitas, Yakima, Grant, and Benton Counties, Washington

Dear Mr. Driessen:

The Department of the Interior (Department) has reviewed the subject draft environmental impact statement for the proposed Schultz-Hanford Area Transmission Line Project, DOE/EIS-0325, to be located in Kittitas, Yakima, Grant, and Benton Counties, Washington. The following comments reflect considerable concern about environmental impacts related to the construction and operation of the proposed project, especially for the project's potential to adversely affect the operation and management of the Hanford Reach National Monument and the Saddle Mountain National Wildlife Refuge. The Department requests that the Bonneville Power Administration (BPA) address these concerns, including continued consultation and coordination with the Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge, during the development of the final environmental impact statement for this proposed project.

GENERAL COMMENTS

In December 2001, the Department, through the U.S. Fish and Wildlife Service, Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge, provided preliminary comments on an earlier draft of this environmental document. Several text and figure inaccuracies describing administrative boundaries and agency management responsibility on the Hanford Site, the Hanford Reach National Monument (Monument), and the Saddle Mountain National Wildlife Refuge were noted. Concerns were also expressed regarding the treatment of cultural resources. Review of the subject document indicates that most text corrections describing administrative boundaries and

Public Comments

DECLARATION OF SERVICE

I, Nancy Lygren, say:

1. I am now and at all times herein mentioned, a citizen of the United States and resident of the State of Washington, over the age of eighteen years, not a party to the above-captioned action, and competent to testify as a witness.

2. I am employed with the law firm of Williams, Kastner & Gibbs PLLC, 4100 Two Union Square, 601 Union Street, Seattle, Washington.

3. On March 26, 2002, we caused to be served the following documents in the manner indicated:

(1) Letter dated March 26, 2002, Re: Schultz-Hanford Area Transmission Line Project – DOE/EIS 0325, CORRECTIONS: Comments on Draft Environmental Impact Statement Attachments 2 and 3: aerial photographs of overview and springs directed to the Bonneville Power Administration, Communications – KC-7 (Document No. 1265429).

Bonneville Power Administration Communications – KC-7 905 NE 11th Avenue Portland, OR 97232 Fax: (503) 230-3285	X U. S. Mail ___ Facsimile ___ Email
Nancy A. Wittpenn (KEC-4) Environmental Project Lead Bonneville Power Administration 905 NE 11th Avenue Portland, OR 97232 Fax: (503) 230-5699	X U. S. Mail ___ Facsimile ___ Email
Carol Borgstrom, Director Office of NEPA oversight, EH-25 U.S. Dept. of Energy 1000 Independence Avenue S.W. Washington D.C. 20585 Fax: 202-586-7031	X U. S. Mail ___ Facsimile ___ Email

1265438.1

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
500 NE Multnomah Street, Suite 356
Portland, Oregon 97232-2036

IN REPLY REFER TO:

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-026
RECEIPT DATE:
APR 0 3 2002

April 2, 2002

ER02/0150

Mr. Lou Driessen, Project Manager
Bonneville Power Administration
Communications - KC-7
P.O. Box 12999
Portland, Oregon

Subject: **COMMENTS** – Review of Draft Environmental Impact Statement for the Schultz-Hanford Area Transmission Line Project, DOE/EIS-0325, Kittitas, Yakima, Grant, and Benton Counties, Washington

Dear Mr. Driessen:

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GENERAL COMMENTS

In December 2001, the Department, through the U.S. Fish and Wildlife Service, Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge, provided preliminary comments on an earlier draft of this environmental document. Several text and figure inaccuracies describing administrative boundaries and agency management responsibility on the Hanford Site, the Hanford Reach National Monument (Monument), and the Saddle Mountain National Wildlife Refuge were noted. Concerns were also expressed regarding the treatment of cultural resources. Review of the subject document indicates that most text corrections describing administrative boundaries and

Public Comments

26-1 agency management responsibility have been made. However, there is still confusion about the relationship between the Monument and the U.S. Department of Energy (USDOE) in several sections of the document, especially in Chapter 3. Figures throughout the document remain incorrect, and technical details are still lacking or confusing for the cultural resource sections.

26-2 The document suggests that double-circuit towers would be built along some portions of the "new" line, instead of single-circuit structures. We strongly recommend using double circuiting on Monument lands to avoid new ground disturbance that would be incurred by developing a new row of towers adjacent to the existing towers. The Monument Proclamation states that *"Existing Federal Columbia River Transmission System facilities located within the monument may be replaced, modified and expanded, and new facilities constructed within the monument, as authorized by other applicable law.* ***Such replacement, modification, expansion, or construction of new facilities shall be carried out in a manner consistent with proper care and management****...*(Proclamation 7319, June 9, 2000) *(emphasis added)*".

The Department believes that the greatest consistency with proper care and management would be achieved by replacing existing structures within the existing Right-of-Way (ROW) without disturbing additional Monument land. To accomplish this, the Department supports a modified preferred alternative which would include use of double circuiting on Monument lands and other lands with resource protection and preservation as primary management objectives. The use of a double circuit tower, rather than multiple, separate single-circuit structures, would decrease the disturbance to monument land.

26-3 In describing impacts to wildlife resources, the draft document fails to explain the significance of impacts. The document reports the litany of species which could be impacted by construction and operation of the proposed transmission line, reports the types of mitigation measures which would be used to offset impacts, and finally provides an overall assessment of post-mitigation impact. This is accomplished in a table using single words, such as high, moderate, low, or none. Such an analysis does not assess the overall ramifications of the impact of the proposed action on affected resources; what the National Environmental Policy Act (NEPA) refers to as significance (see 40 CFR 1502.16 (a), (b) and 40 CFR 1508.27). The final environmental statement should explain the reasoning behind the one-word impact assessment. The biological basis for why the proposed mitigation measures are expected to reduce the level of impact, and the ramifications of the level of impact in the context of existing baseline conditions should be explained.

For example, in section 4.4.3.3, the draft document reports that where the proposed transmission line climbs over Umtanum Ridge, clearing the area would cause high impacts to burrowing owls and moderate impacts to other shrub-steppe dependant species. The document also reports that the "*southern most end of the proposed line crosses the Cold Creek wildlife migration corridor, which is one of the most important bird migration corridors in Washington and an important corridor for wildlife migrating between the Yakima Training Center and the Hanford site. Disturbance to this area could disrupt the migration patterns of these species and increase the hazard of avian collisions with transmission lines and structures (moderate impact).*"

26-3 cont. The measures recommended in section 4.4.10 to mitigate these impacts include consulting with wildlife agencies to avoid construction during migration times, monitoring potential problems after construction, and installing line markers in areas with high risk for avian collisions. However, no biological rationale is provided to explain why these proposed measures are expected to reduce impacts to wildlife species or document their effectiveness. In addition, there is no discussion of the overall ramifications of such impacts in the context of how important these habitat areas are to local and regional wildlife populations. Thus the reader, as well as any potential decision-maker, cannot assess the significance of the direct and indirect impacts reported in the document. The final environmental statement should include an analysis, which better explains the effectiveness of the recommended mitigation measures and better assesses the significance of the post-mitigation impacts.

26-4 The U.S. Fish and Wildlife Service (USFWS) has engaged in pre-development consultation with BPA and its consultants. We expect that formal consultation pursuant to section 7 of the Endangered Species Act and its implementing regulations at 50 CFR 402.14, will be initiated by BPA with the USFWS in the near future. Federal agencies are required to review their actions at the earliest possible time to determine whether any action may affect listed species or critical habitat. If such a determination is made, consultation with the USFWS is required.

The BPA should prepare a Biological Assessment (BA) to evaluate the potential effects of the project on listed and proposed species and critical habitat, and determine whether any such species or critical habitat are likely to be adversely affected by the action. Under the Act's implementing regulations at 50 CFR 402.08, the Commission may designate a non-federal representative to conduct informal consultation or prepare a biological assessment. If the BA is prepared by the designated non-federal representative, the BPA must furnish guidance and supervision, and must independently review and evaluate the scope and contents of the BA. The ultimate responsibility for compliance with section 7 remains with the BPA.

26-5 The document's treatment of cultural resources lacks technical detail. For example, the details of the proposed substation at Wautoma are minimal. It is in the vicinity of Dry Creek, which may have significant natural and cultural resources. More complete details about the location and construction of the substation would be useful. The final environmental statement should also explain how the substation would affect or be affected by the proposed Black Rock Reservoir in that area.

The lack of detail may explain the generic treatment of the cultural resources information discussed in section S.3.11 of the document summary. This section should provide a concise synopsis of the data known in the project area; the types of sites, number of sites, site significance, etc. It should state clearly where gaps exist in the known data. Pursuant to NEPA and 36 CFR 800, cultural resource values must be considered equally with other environmental values.

Public Comments

Mr. Lou Driessen, Project Manager 4

26-5 cont.

Although it is often impossible to have 100 percent field survey at the draft environmental assessment stage, the analysis should clearly state where such information is incomplete. As currently presented, each Alternative and Segment varies as to the level of field coverage and, hence, cultural resource documentation. Definitive numbers of sites and "sensitive areas" are at best preliminary. For example, Map 11 has few cultural resource areas identified on Segments D and E. Does this reflect a lack of sites or a lack of survey(s)? Similarly, little information is discussed about project areas previously surveyed. The map shows a number of identified cultural resource areas along Segment C, yet the cultural resources technical report lists only 55 sites for all of Alternative 3, compared to over 90 for the other two alternatives. The cultural resources technical report even mentions the different level of survey between the two Segment B options. Thus, a major discrepancy in the quantification of cultural resource information exists in the draft document. One cannot discern with confidence the number of cultural resource sites potentially at risk, or the type of sites within a designated "sensitive area." Section S.4.11 reports the number of sensitive areas and the square miles for each alternatives show, but does not explain why the number of cultural resource sites as listed in the cultural resources technical report are not. Consequently, the information portrayed in the draft environmental document shows little significant difference in the impacts to cultural resources between alternatives. Flushing out the details on the cultural resources affected is necessary to make an informed decision.

More importantly, the Section 106 process for the implementation of the National Historic Preservation Act, in accordance with 36 CFR 800, requires sites to be evaluated for significance. It is a site's eligibility for the National Register of Historic Places that is critical to the environmental review process. The draft document presents no information on the eligibility of any of the sites discussed, nor is there any mention of undertaking this process even on the sites previously recorded. Without eligibility determinations for these sites, the comparison of any of the cultural resources information for the selected alternatives does not contribute to the draft's use as an environmental decision document.

Lastly, there is no information regarding consultation with Native Americans and Tribal entities on Traditional Cultural Properties, use areas, sacred areas, etc. The forthcoming Phase II cultural resource survey should include such information. This information would also need to be included in the final environmental document and added into the equation for determining site significance.

SPECIFIC COMMENTS

26-6

Section S.2.2.9 Communications Equipment - This section states that as part of the preferred alternative, approximately 59.3 miles of fiber optic cables would be strung between the Vantage Substation and the new Wautoma Substation, and between the Vantage and Columbia Substations. It is not clear whether the installation of these cables along existing transmission lines would result in ground disturbing activities that are in addition to those associated with the

Mr. Lou Driessen, Project Manager 5

26-6 cont.

construction of the Schultz-Hanford line. If so, it would be prudent to include a description of these activities and to quantify the amount of ground disturbance that would take place.

26-7

Section S.4.5 Fish Resources - The third paragraph of this section states that Segment A of the preferred alternative would cross streams that are designated as critical habitat for Middle Columbia River steelhead and bull trout. This statement is incorrect regarding bull trout. At this time, the U.S. Fish and Wildlife Service has not designated critical habitat for bull trout.

26-8

Section S.4.6 Land Use Impacts - This section should explain the standard used to establish the height of towers and conductors along transmission line routes. The option of installing shorter towers in some areas to match the profile of existing lower voltage transmission lines as a measure to reduce visual impacts and the likelihood of bird collisions should be analyzed.

26-9

Section 1.1 Need for Action - Increasing the reliability of the current transmission system is one of the stated needs for this project. Please explain whether the current transmission system has enough capacity to reroute the flow of electricity without lengthy interruption in the event of a catastrophic line failure. Will the construction of the proposed 500 kV line necessitate the construction of another 500 kV line along a different route to provide system reliability in the event of a line failure? If such future construction is likely, then the effects of those actions should be addressed now instead of adding it piecemeal at a later date.

26-10

Section 2.1.1 Segment A - This section mentions a potential reroute for this segment. The conditions or criteria that would be used to determine whether the original route or the potential reroute would be chosen for implementation should be explained.

26-11

Section 2.2.1.1 Structures - In addition to the double circuit lines proposed for the agricultural land along Segment D of the preferred alternative, the possibility of utilizing double circuit structures in areas where the transmission line would be in close proximity to sensitive plant populations should also be considered as a measure to minimize land disturbance.

26-12

Table 2.8-1 - Under the preferred alternative column on page 2-23, the table states that the introduction or spread of weed species would be a low to moderate impact. The introduction and spread of weeds is one of the greatest threats to native ecosystems nationwide. Documented impacts of weed invasion include dramatic reductions in both the structural and biological diversity of plant and animal communities. These impacts should not be classified as low.

26-13

We assume that Table 2.8 1 lists the selected alternatives in preferential order. If so, this information should be stated in the table title and in the document. On page 2.27 of the table under Visual Resources on the Preferred Alternative, Segment G is discussed. There is no Segment G identified on the accompanying map.

26-14

Table 3.4-1 - The units used in this table are misleading. Linear miles are not a unit that can be used to describe vegetation "cover". For example, if a plant community or population covers 1

Public Comments

26-14 cont. mile and the segment width is 0.5 miles, this could encompass 310 acres. All of this information should be presented as acres, or some proportion of the total acres included in the project. These tables should be changed to reflect acres or proportions. Vegetative cover data should be presented in the text as is it on page 4-27. This convention should be used consistently throughout the document.

26-15 Several areas of importance identified by the Washington State Natural Heritage Program (WNHP) are impacted by the project. However, information on the relative size or importance of these areas statewide is not presented. The size in acres of each of these areas, and the total area of each of these communities that remain should be stated so that their importance can be evaluated. For example, the project may *only* impact 5 acres of one of these communities, but if there are only 15 acres like it remaining in the state, impact significance could be considered very high. It is difficult to assess the real impacts to these WNHP sites without knowing the relative abundance of these areas statewide.

26-16 Rare plant surveys were conducted in August 2001, which is too late in the year to identify many plants in the Columbia Basin. Most plants are dormant by the heat of the summer and many have disappeared from the landscape. Further surveys should be conducted during the spring growing season, March through May, and should also be based on known phenology of the listed plants.

26-17 **Section 3.5 Wildlife -** The reference to Johnson and O'Neil is misleading because there are many more wildlife species that occupy these habitats than the opening statement suggests. Johnson and O'Neil present information for 150 species that have an association with shrub-steppe habitats. There are, however, many more generalist species and migratory species that occupy shrub-steppe habitats. The difference is that species that are associated rely on aspects of the shrub-steppe habitat for their life-cycle, whereas other generalists and migratory species may use or occupy these habitats, and other habitats as well. This section should be revised to reflect that 150 species are associated with shrub-steppe habitats, but many more species use or occupy these habitats.

26-18 **Section 3.5.2 Segment B -** Canadian geese should be changed to read Canada Geese.

26-19 **Section 3.5.3 Segment C -** The statement that the elk herd has "dramatically increased" over the past several years is incorrect. The herd has decreased since 2000. We are unaware of any evidence or data indicating that elk populations in surrounding areas have originated from the Rattlesnake herd.

26-20 **Section 3.5.5 Segment E -** Brunkal is misquoted on page 3-37 as stating that pygmy rabbits and sagebrush voles are known to exist in Hanford Reach National Monument. Potential habitat for these species exists, but no surveys have been conducted to verify the presence/absence of these species. Historical information suggests that these species may have been present in these areas. The most recent surveys, which were *not* exhaustive, suggest pygmy rabbits have been extirpated from the area.

26-21 **Section 3.3.7 Threatened and Endangered Species -** This section needs to be revised to include the pygmy rabbit (*Brachylagus idahoensis*) as an endangered species. The Columbia Basin pygmy rabbit was granted immediate endangered species status under the emergency rule provision of the Endangered Species Act on November 30, 2001.

26-22 **Table 3.5-1 -** Page 3-41 lists sagebrush vole twice and each listing has different information.

26-23 **Table 3.7-2 -** This table does not reflect lands that are owned by USDOE and administered by the USFWS.

26-24 **Section 3.7.2.2 Public Agency Administered Lands -** The study area includes crossing of the Saddle Mountain, Wahluke, and Columbia River Islands/Dunes Units of the Hanford Reach National Monument. The study area also includes crossing of the Hanford Reach of the Columbia River. This river reach was found suitable for inclusion in the National Wild and Scenic Rivers system under "Recreational River" classification in the National Park Service's Hanford Reach of the Columbia River Comprehensive Conservation Study/EIS, (June, 1994). The Hanford Reach is currently under interim protection as directed by Public Law 100-605, as amended by Section 404 (Hanford Reach Preservation) of Public Law 104-333. The USFWS is responsible for overseeing interim management protection.

26-25 **Section 3.7.6.2 USDOE Lands -** The description for the Hanford Reach National Monument should be altered to reflect the following: The lands within the Monument are divided into five major management units: Fitzner-Eberhardt Arid Lands Ecology Reserve (administered by USFWS), McGee-Riverlands Unit (administered by USDOE), Saddle Mountain Unit (USFWS), Wahluke Unit (USFWS), and the Columbia River Islands/Dunes Unit (USDOE).

26-26 **Section 3.7.7.2 Public Lands -** Segment E would cross through the Saddle Mountains Unit of the Hanford Reach National Monument. Please delete the word "uninhabited" when describing wildlife habitat.

26-27 **Section 3.7.8.2 USDOE Lands -** Change text to reflect the following: Segment F crosses the Wahluke Unit of the Hanford Reach National Monument, which receives year-round recreation use.

26-28 **Section 3.9 Visual Resources -** The state highway 24 and 12 travel corridors, the Vernita Bridge rest stop, and the primitive boat launch are key viewing areas for travelers and recreationists associated with the Hanford Reach National Monument. Visual impacts and potential mitigation for these areas should be assessed in the final environmental document.

26-29 **Section 3.10.4 Hanford Reach National Monument -** The Saddle Mountain Unit is situated on the north side of the Columbia River. Public access to this area is currently limited to permitted research and environmental education activities only.

Public Comments

26-29 cont. The Wahluke Unit, located north and east of the Saddle Mountain Unit, provides 57,000 acres of recreational opportunities in the Hanford Reach National Monument. Popular recreation pursuits include sightseeing, hiking, photography, bird watching, hunting, fishing, and environmental education. Current visitor use facilities consist of directional signing, improved roads, boat launches, and parking areas.

26-30 **Table 4.1-1** - To accurately represent the acres of ground disturbance associated with each of the construction alternatives, this table should include the number of acres that would be disturbed at line tensioning sites, staging areas, and the construction of the new substation.

26-31 **Section 4.3 Vegetation** - Fragmentation of vegetation communities should be addressed as part of the construction impacts. Larger parcels of vegetation/habitat have greater biodiversity. Fragmentation reduces biodiversity and decreases surrounding habitat quality and quantity.

26-32 **Section 4.3.1 Vegetation Impact Levels** - The permanent removal of vegetation from an area dominated by non-native species may not be a low impact if the vegetation actually being removed consist of the native portion of the plant population.

26-33 Increasing the density of noxious weeds in a location where they already exist should not be classified as a low impact to the vegetative community. An increase in the density of noxious weeds at a particular location may result in increased seed production and dispersal and thereby increase the rate of noxious weed invasion to adjacent areas.

26-34 **Section 4.3.3.1 Segment A** - The number of acres and proportion of the Wyoming big sagebrush/bluebunch wheatgrass plant community that would be affected by the construction of segment A should be described.

26-35 This section states that there would be no direct impact to Ute ladies' tresses because the wetland habitats where the plant may be found would be avoided by the transmission line tower placement. However, access roads along the transmission route include the installation of culverts and stream crossings that may result in a direct impact to this species during both construction and operation and maintenance. These potential impacts should be addressed in the final environmental statement.

26-36 **Section 4.3.3.3 Segment D** - The number of acres and proportion of the Bitterbrush/Indian ricegrass plant community that would be affected by the construction of segment A should be described. The conditions or criteria that would be used to determine whether a double circuit structure would be used in the area of the Umtanum buckwheat population should be explained.

26-37 This section states that there would be no direct impact to Ute ladies' tresses because the wetland habitats where the plant may be found would be avoided by the transmission line tower placement. However, access roads along the transmission route include the installation of culverts

26-37 cont. and stream crossings that may result in a direct impact to this species during both construction and operation and maintenance. The potential impact of these construction activities on Ute ladies' tresses should be addressed in the final environmental statement.

26-38 **Section 4.3.8.2 Native Plant Communities** - Shrub-steppe communities can be restored. On the Hanford Site, the USDOE is required to restore acres at a 3:1 ratio (Hanford Site Biological Resources Management Plan, 2000) of acres restored to acres disturbed through construction. Shrub-steppe restoration has been underway in the Hanford area for several years. There are many acres of public land near the proposed project with restoration potential. The existing 3:1 ratio should be considered as a precedent for BPA to mitigate project-caused shrub-steppe habitat losses, particularly for the impacted acres on the Hanford Reach National Monument, and within the Hanford Site that are designated as Preservation in the Hanford Site Comprehensive Land Use Plan. The Department recommends that the USDOE and BPA continue to consult and coordinate with USFWS Monument/Saddle Mountain National Wildlife Refuge staff regarding when, where, and how such mitigation should occur.

26-39 The use of non-invasive, non-native species for re-seeding disturbed areas when there are seed sources for native species available is not recommended.

26-40 **Section 4.3.8.3. Rare Plants** - The discussion regarding rare plants suggests that double circuit structures could be used in these areas as mitigation. However, this strategy is not included in the mitigation section. As previously mentioned, the Department strongly recommends the use of double circuit structures on Monument lands to avoid new ground disturbance that would be incurred by developing a new row of towers adjacent to the existing towers.

26-41 **Section 4.4.2.1 Construction Impacts** - Wildlife habitat destroyed by this project should be mitigated through habitat improvements in other areas, or on adjacent public lands. The Department recommends that the USDOE and BPA continue to consult and coordinate with USFWS Monument/Saddle Mountain National Wildlife Refuge staff regarding when, where, and how such mitigation should occur.

26-42 **Section 4.4.2.2 Operation and Maintenance Impacts** - There is no mention in this section of the potential electrocution of perching and migratory birds, particularly hawks and eagles. This issue and measures to prevent the electrocution of raptors and other migratory birds should be addressed in the final environmental assessment.

26-43 Post-construction surveys should be conducted to evaluate actual collision impacts, and provisions made for further mitigation if avian mortality exceeds an identified threshold.

26-44 **Section 4.4.8 Threatened and Endangered Species** - This section needs to be revised to include the pygmy rabbit (*Brachylagus idahoensis*) as an endangered species. The Columbia Basin pygmy rabbit was granted immediate endangered species status under the emergency rule provision of the Endangered Species Act on November 30, 2001.

Public Comments

Mr. Lou Driessen, Project Manager 10

The USFWS has engaged in pre-development consultation with BPA and its consultants. We expect that formal consultation pursuant to section 7 of the Endangered Species Act and its implementing regulations at 50 CFR 402.14, will be initiated by BPA with the USFWS in the near future.

26-45 **Section 4.4.8.1 Bald Eagle** - This section states that with mitigation, the project would have no impact on bald eagles. It is highly unlikely that there would be absolutely no impact to bald eagles as a result of project construction and operation. The temporary displacement of eagles from foraging areas during construction or operations and maintenance is just one of the possible impacts that may result. Although this level of impact may be minimal it is an impact nonetheless.

26-46 **Section 4.4.8.4. Sage grouse** - Sage Grouse are prone to collision mortality with powerlines. The anticipated expansion of the population of sage grouse on the Yakima Training Center to the Hanford Reach National Monument should be considered, and corridors for the movement of grouse between these areas should be maintained. Additionally, increased avian predators using the powerlines for perches from which to hunt could have a dramatic impact on sage grouse.

Section 4.4.10.4 Shrub-steppe Habitat loss and Mitigation - Please refer to prior comments for section 4.3.8.2 - Native Plant Communities.

26-47 **Section 4.4.10.5 Wildlife Disturbance Mitigation** - Seasonal activity restrictions should occur during the breeding/nesting season from March 1 through August 31.

26-48 The draft document does not address mitigation for impacts to migrating and/or resident bats.

26-49 **Section 4.4.10.2 Avian Collision Mitigation** - Avian collisions are minimized not only by minimizing the vertical separation between structures but also by minimizing the horizontal separation between structures. Mitigation could be enhanced by reducing the number of structures and lines to a minimum; i.e., using the single, double circuit to hold the lines rather than creating new lines. Visual indicators should be used on all lines crossing the Monument, all water crossings, and areas adjacent to wetlands that may be frequented by waterfowl. All lines should use insulators in areas where birds may perch and be electrocuted.

26-50 **Section 4.4.11 Cumulative Impacts** - Adequate mitigation is not proposed for long-term declines in wildlife habitat. We suggest BPA target areas that are identified as habitat preservation areas for wildlife habitat enhancement mitigation.

26-51 **Section 4.5.2.2 Operation and Maintenance Impacts** - The discussion in this section should mention that information on the effects of Electric and Magnetic Fields (EMF) on humans and fish and wildlife is available in the appendix.

Mr. Lou Driessen, Project Manager 11

26-52 **Section 4.5.8.3 Bull Trout Columbia River DPS** - The first sentence of this section is not correct. At this time, the USFWS has not designated any areas of critical habitat for bull trout.

26-53 **Table 4.5-3** - The reference for the "FP" designation Under Federal Status for the coastal cutthroat trout does not appear at the bottom of the table.

26-54 **Section 4.6.2 Land Use - Impacts Common to Construction** - Table 4.6-1 does not include "preservation" as a type of existing land use. Monument lands are identified in the USDOE Comprehensive Land Use Plan and EIS as Preservation Lands. This section should indicate that impacts to the Preservation Lands of the Monument and Refuge would occur and would include loss and degradation of wildlife habitat, increased habitat fragmentation, and increased human disturbance of wildlife.

26-55 **Section 4.6.8 Recommended Mitigation** - Locating structures outside of agricultural fields may increase the level of disturbance to native habitat types and promote increases of invasive species. We suggest adding an action to restore or improve rangeland acres through rehabilitation re-seeding and planting on other public land areas. We suggest adding an action to use double circuit structures in areas managed for preservation and resource protection.

26-56 **Section 4.6.3.1 Segment A** - The wording used to describe impacts to agriculture land should also be used to describe impacts to preservation lands, e.g., "Even though the total quantity of *preservation* lands being affected is relatively limited, the impact to this land would be high due to the land being permanently converted from its *preservation* use."

26-57 **Section 4.9.5 Recreation Mitigation** - Posting signs and information at trail heads may not be adequate notification for users traveling from long distances. Increased measures to inform the public of recreational restrictions should be implemented so that people are not traveling long distances just to be turned away. Additionally, alternative recreational sites could be included on signs that indicate closures.

26-58 **Section 4.10 Cultural Resources** - The discussion in this section is general and lacks technical detail. It would be more useful if specific site survey information was available as previously mentioned. The general recommendations for various types of construction activities are unnecessary for the most part; e.g., "The presence of conductors, overhead ground wires and insulators would probably have little or no direct effect on archaeological and historical sites."

26-59 **Section 4.10.5 Recommended Mitigation** - Most of the discussion in this section has little to do with mitigating cultural resource impacts, but rather focuses on other steps in the environmental review process; e.g., study methods, site identification, site evaluation, etc., that should be developed and expanded in other sections of the document. This section would be improved by articulating the site specific actions to be implemented along the project ROW to preserve and protect identified cultural resource sites and artifacts.

Public Comments

26-60 **Section 4.10.6 Cumulative Impacts** - This section could be improved by providing more information relative to the proposed project's contribution to potential cumulative impacts on cultural resources. Based on the concluding remark in the last paragraph, one would surmise that such cumulative impacts are likely to be significant. The final environmental document should specify the action(s) that would be implemented to avoid, mitigate, rectify, or compensate for the project's contribution to cumulative damage to cultural resources.

26-61 **Section 4.11.5 Fire** - This section refers to construction that would occur during the summer months (winter months would be largely unrestricted, due to "low" fire danger), but does not provide many specifics on prevention/suppression of fires arising from construction work. We recommend a 3-tiered restriction based on fire danger rating, similar to how the USFWS limits human uses (open fires, camp stoves, smoking, etc.) or industrial activities (mowing, road scraping, welding, etc.) as fire danger increases. The USFWS can provide fire danger ratings to the COR or other entity on a daily or weekly basis. The restriction tiers would be accompanied by respective prevention/suppression requirements at each level (i.e., fire extinguishers, pumps, water tenders, etc.). Ultimately, the USFWS would reserve the right to prohibit high fire-risk activities during periods of "very high" or "extreme" fire danger.

26-62 **Section 5.2.2 Wildlife** - This section states that with mitigation, the project would have no impact on bald eagles. It is highly unlikely that there would be absolutely no impact to bald eagles as a result of the proposed project. The temporary displacement of eagles from foraging areas during construction or operations and maintenance is just one of the possible impacts that may result. Although this level of impact is minimal, it is an impact nonetheless.

26-63 **Appendix C: Line Separation** - There is no risk analysis associated with the justification that lines need to be separated by 2000 feet. Data should be presented that documents how often transmission lines are struck by lightning, how often a line falls onto another line, etc. It is difficult to assess the actual need for 2000-foot line separation without information on the frequency/risk of such occurrences.

26-64 **Appendix D: Property Impacts** - This section presents the action of removing existing transmission lines and replacing them with new lines in the same location as a mitigative strategy. We suggest that this action instead be brought forward and considered as a separate alternative, which would have potentially less overall environmental impact than several of the other alternatives proposed. This action, at a minimum, should be considered for use on all Monument lands and other lands with preservation and resource protection as primary management objectives.

26-65 **Appendix H: Phase I Cultural Resources Assessment** - We appreciate that this technical report has been modified and improved since the last iteration. Unfortunately, there is still confusion about the relationship between the Monument and the U.S. Department of Energy (USDOE); important figures are absent or remain incorrect, and technical details are still lacking. This confusion and lack of detail in the technical report is carried forward into the draft environmental

26-65 cont. document further compounding errors and omissions. There is still no overview map included, though one is referenced in the report. Figure 4.1 is referenced but not included in the report. Table 4.2 would be helpful if it contained the number of sites known for each alternative as well. A definition or description of what constitutes a "sensitive area" is not provided. Information on the number and type of cultural resource sites within the project area and how many of them are eligible for the National Register of Historic Places is not provided. The background historical/ethnographic information is limited and selective. Major gaps occur, such as Hanford site and pre-Hanford agricultural history. There are abundant data for reference on Hanford. These deficiencies should be corrected prior to completion of the final environmental document.

SUMMARY COMMENTS

26-66 The Department appreciates the opportunity to provide comments on the draft environmental impact statement for the Schultz-Hanford Area Transmission Line Project. We recommend that the final environmental statement include all direct, indirect, and cumulative impacts to fish and wildlife and their habitats, cultural resources, and Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge lands resulting from construction, operation, and maintenance of the proposed project. We encourage USDOE and BPA to continue consultation and coordination with USFWS Monument/Saddle Mountain National Wildlife Refuge staff regarding means and measures to ameliorate the project's effects on fish and wildlife and other environmental values. Consultation with the USFWS pursuant to section 7 of the Endangered Species Act should begin as soon as possible. Questions or concerns regarding these comments, or requests for additional information regarding potential project effects on fish and wildlife resources, and Monument and Refuge lands should be directed to Mr. Mark Miller, Project Leader, U.S. Fish and Wildlife Service, Eastern Washington Fish and Wildlife Office, P.O. Box 848, Ephrata, Washington 98823 (509-754-8580), and/or Mr. Greg Hughes, Project Leader, Hanford Reach National Monument/Saddle Mountain NWR, U.S. Fish and Wildlife Service, 3250 Port of Benton Blvd., Richland, WA 99352 (509-371-1801), respectively.

Sincerely,

Preston A. Sleeger
Regional Environmental Officer

Public Comments

Service List

Mr. Terry N. Martin
U.S. Department of the Interior
Office of Environmental Policy and Compliance
1849 C Street, Mail Stop 2340
Washington, DC 20240

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U.S. Fish and Wildlife Service
Division of Federal Project Activities
4401 N. Fairfax Dr., Rm 400
Arlington, VA 22203

Mr. Estyn R. Mead
Regional Hydropower Coordinator
U.S. Fish and Wildlife Service
Division of Habitat Conservation
911 NE 11th Avenue
Portland, Oregon 97232-4181

Mr. Gregg Kurz
U.S. Fish and Wildlife Service
Eastern Washington Fish and Wildlife Office
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Mr. Don Voros, Regional Chief
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Mr. Stephen Moore, Division Chief
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Mr. Lonnie Selam, Chairman
Yakama Indian Nation
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Mr. Samuel Penny, Chairman
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Gary Burke, Chairman
Confederated Tribes of the Umatilla Indian Reservation
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Pendleton, OR 97801

Messrs. Max Benitz, Jr., Leo Bowman, and Claude Oliver
Benton County Commissioners
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Prosser, WA 99350

Ms. Sue Miller, Ms. Neva Corkrum, and Mr. Frank Brock
Franklin County Commissioners
1016 N. 4th
Pasco, WA 99301

Ms. Debra Moore, Mr. LeRoy Allison, and Mr. Tim Snead
Grant County Commissioners
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THE CONFEDERATED TRIBES of THE COLVILLE RESERVATION

POST OFFICE BOX 150 · NESPELEM WASHINGTON 99155 PHONE (509) 634-2200

April 1, 2002

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS – 027
RECEIPT DATE:
APR 04 2002

Bonneville Power Administration
Communications- KC-7
P.O. Box 12999
Portland, OR 97212

Re: Comment on DEIS for Schultz-Hanford Transmission Line Project

To Whom It May Concern:

This letter presents the comments of the Tribal Historic Preservation Officer (THPO) of the Confederated Tribes of the Colville Reservation (CCT) on the Draft Environmental Impact Statement (DEIS) for the Schultz-Hanford Transmission Line Project.

27-1 Of principal concern is that the agency has not initiated or maintained appropriate consultation with the CCT on this project as required by the National Historic Preservation Act. This has not occurred despite a request by the CCT THPO for formal consultation.

The CCT conducted a Phase I records research project for this DEIS. Our technical report has been used selectively in developing the Cultural Resources section of the DEIS. 27-2 Incomplete information or interpretations of the content of our technical report have led to incorrect statements or representations. In particular, Map 11 depicts "cultural areas" rather than sensitive areas, the latter of which included areas with high *potential* for cultural resources, an important distinction especially since this map could be misused to vandalize sites and potential site areas. The potential for vandalism also is a concern and we ask that this map not be included in the Final EIS. Federal law specifically exempts site location information from public presentations, even in the face of Freedom of Information Act requests.

27-3 The definition of "lithic" is inaccurate: lithic is Latin for stone and therefore refers to anything stone, not just tools. The sentence where "debitage" is defined in a side-bar has an extra "the." The table of contents references incorrect page numbers for this section of the DEIS. 27-4 The Appendix H technical report references a map of the different alternatives and segments which we expected would be included by Parsons-Brinkerhoff, but no map has been included or referenced to Volume I.

We look forward to consultation meetings on this project, which should include an opportunity to comment on the cultural resources work to follow as this project proceeds toward construction.

Sincerely,

Adeline Fredin
Tribal Historic Preservation Officer

cc. Allyson Brooks, State Historic Preservation Officer

Public Comments

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

PUBLIC INVOLVEMENT
LOG#: SHDEIS-028
RECEIPT DATE: APR 22 2002

April 19, 2002

Reply To
Attn Of: ECO-088

Ref: 00-061-BPA

Nancy Wittpenn
Bonneville Power Administration (KEC-4)
P.O. Box 3621
Portland, OR 97208

Dear Ms. Wittpenn:

The Environmental Protection Agency (EPA) has completed its review of the draft Environmental Impact Statement (EIS) for the proposed **Schultz-Hanford Area Transmission Line Project** (CEQ No. 020049) in accordance with our authorities and responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act. The draft EIS has been prepared by the Bonneville Power Administration (BPA) to evaluate options to resolve the current and projected lack of transmission capacity in the region. The EIS evaluates four transmission line alignment alternatives as well as the No Action alternative. The draft EIS identifies Alternative 2 as the agency-preferred alternative.

Based on our review and evaluation, we have assigned a rating of EC-2 (Environmental Concerns -Insufficient Information) to the draft EIS. This rating, and a summary of our comments, will be published in the *Federal Register*. A copy of the rating system used in conducting our review is enclosed for your reference.

Our concerns are related to the following topics:

- *Purpose and need for the project;*
- *Range of alternatives evaluated in the EIS;*
- *Rationale for development and assessment of certain project segments (Segment A Reroute and Segment B);*
- *Characterization of Expected Effects;*
- *Proposed Mitigation Measures;*
- *Monitoring and Evaluation Plan; and*
- *Rationale for development and assessment of certain project segments (Segment A Reroute and Segment B).*

These issues are discussed in greater detail in the enclosure to this letter.

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2

Thank you for the opportunity to provide comments on the draft EIS. I urge you to contact Bill Ryan of my staff at (206) 553-8561 at your earliest opportunity to discuss our comments and how they might best be addressed for the project.

Sincerely,

/s/

Judith Leckrone Lee, Manager
Geographic Implementation Unit

Enclosures

Public Comments

EPA Comments
on the
Schultz-Hanford Area Transmission Line Project
Draft Environmental Impact Statement (EIS)

Purpose and Need and Range of Alternatives

28-1

We are concerned that the cursory manner in which the need for the proposed project is presented in the EIS leads the reader to the conclusion that the only solution to the lack of carrying capacity of the existing transmission lines is the construction of additional transmission lines (and specifically the proposed Schultz-Hanford transmission line). Additionally, by including "meet energization date of late 2004" as a project purpose, the EIS suggests that the solution must include the construction of a transmission line that will be operational in 2004. While we have no reason to disagree with the underlying need to resolve the current and projected lack of transmission capacity in the region, we do have concerns that the manner in which project purpose and need is presented appears to result in no assessment of alternatives that could be employed to address the underlying need without constructing additional transmission lines in general and the proposed project specifically (so called nonwires solutions). The National Environmental Policy Act (NEPA) implementing regulations direct Federal agencies to "use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects...upon the human environment" and to "use all practicable means...to...avoid or minimize any possible adverse effects of their actions on the human environment" (see 40 CFR 1500.1(e) and (f)). In order to meet that direction, we believe that the EIS must include an evaluation of nonwires alternatives that could meet (or contribute to meeting) the underlying need and achieve the project purposes of maintaining transmission system reliability, optimize transmission system usage, minimize environmental impacts and minimize overall costs. We recommend that the EIS be revised to include an assessment of alternatives such as demand management, distributed generation, interruptible/curtailable rates and transmission pricing solutions.

Characterization of Expected Effects

28-2

We are concerned with the manner in which expected impacts related to the proposed project have been characterized in the draft EIS, particularly with respect to the effectiveness of recommended mitigation measures. The EIS is very vague in its presentation of expected impacts from the proposed project. Many of the characterizations are described in a manner such as "(i)f impacts to these species cannot be avoided, it would be a moderate level of impact. Impacts could be reduced to a low level if successful mitigation is implemented." Such characterizations suggest the following:

- Insufficient baseline data have been collected to truly understand where specific project impacts would occur and where appropriate mitigation should be applied.
- A strategy to define and implement meaningful measures to avoid, minimize, or compensate for project-related effects has not been developed.

Ultimately, the effects analysis in the EIS should reflect an understanding of the resources

28-2 cont.

that would be affected by the project (the affected environment), an assessment of the potential impacts to identified resources, and a reflection of effects that would be expected with the application of necessary mitigation measures. As presently written, information related to the affected environment, needed to define expected impacts, does not appear to be adequate to support a meaningful effects analysis. For example, the draft EIS indicates that additional plant and wildlife surveys will be undertaken to better define the existence and locations of rare plants or high value plant communities as well as endangered, threatened, candidate or sensitive wildlife species within the project area. Until these surveys are completed (for all alternatives) we do not believe that effects can be evaluated relative to the criteria identified on pages 4-22 and 4-23 (for vegetation) and page 4-36 and 4-37 (for wildlife).

28-3

Additionally, the EIS does not present 1) identified mitigation measures in a manner that indicates that they would be implemented, 2) the locations where they would be applied, or 3) information related to their expected effectiveness. The clear identification of mitigation measures that would be employed with project implementation, the identification of locations where they would be applied, and a discussion (citing applicable reports, papers, etc) of their effectiveness in avoiding or reducing effects, are needed to establish the project-related impacts that are to be reported in the EIS.

28-4

We recommend that the EIS be revised to include characterizations of effects that reflect sufficient site-specific knowledge of the specific resources at risk and the implementation of mitigation measures that would be used with project implementation.

Proposed Mitigation Measures

We have concerns with the mitigation measures recommended for implementation in the EIS, as presented below:

28-5

- Many of the mitigation measures contain phrases such as "if possible," "to the extent possible," "as needed", and "if necessary." We recommend removing such phrases from the mitigation measures as we believe that mitigation measures should reflect clear direction and commitment related to what will be done to mitigate effects. If certain conditions exist where exceptions would need to be made, those conditions should be explicitly identified as part of the measure.

28-6

- The EIS indicates that site-specific surveys for plants and wildlife (only for the preferred alternative route) would be conducted to identify areas where rare plants occur and areas of listed, candidate, of species of concern exist. We do not view surveys of this type as mitigation. As described in the EIS, they appear to be necessary to define the effects from the proposed project and identify necessary mitigation measures. We believe that such information should be reflected in the EIS, per the direction of the implementing regulations for NEPA to "insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken" (40 CFR 1500.1(b)) and to "include appropriate mitigation measures not already included in the propose action or alternatives" (40 CFR 1502.14(f)). We also believe that such surveys should be conducted for all alternatives to ensure that appropriate environmental information is available to the public and the decision maker prior to decisions being

Public Comments

28-6 cont. made.

28-7 The EIS indicates that a spill prevention/spill response plan would be developed prior to construction of the project. Like the proposed plant and wildlife surveys, the development of this plan is necessary for defining the effects from the proposed project and identify necessary mitigation measures. We believe that such information should be reflected in the EIS, per the direction of the implementing regulations for NEPA to "insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken" (40 CFR 1500.1(b)) and to "include appropriate mitigation measures not already included in the propose action or alternatives" (40 CFR 1502.14(f)).

The EIS should clearly present the mitigation measures that would be applied and ultimately committed to in the Record of Decision (ROD) for the project.

Monitoring and Evaluation Plan

28-8 We believe that it is extremely important that project-level monitoring be designed and conducted to determine whether mitigation measures are achieving their desired/expected resource protection outcomes. To ensure that such efforts would be undertaken for the proposed project and that they would be conducted in a systematic and predictable fashion, we recommend the development of a monitoring and evaluation plan for the propose project (for inclusion in the EIS). This plan would include the design of appropriate monitoring methods, establishment of evaluation and reporting mechanisms, and include a framework for making appropriate changes based on the results of the monitoring. Such a plan would ensure the evaluation of whether mitigation measures committed to in the ROD for the project have actually been implemented (implementation monitoring) and the effectiveness of those measures in offsetting or reducing impacts (effectiveness monitoring). We ultimately see that the development and implementation of a monitoring and evaluation plan will provide the Bonneville Power Administration with useful information related to project implementation that will also aid in future planning efforts.

Segment A Reroute

28-9 Page 2-2 of the draft EIS indicates that Segment A may require a small (approximately 1 mile) reroute of the proposed and existing transmission lines approximately 7 miles southeast of the Schultz Substation. As presently written, the EIS does not discuss why this reroute is being considered or how it was developed/determined. We recommend that the EIS be revised to clearly describe the reason(s) that the reroute is presently being evaluated and how the particular alignment for the reroute (as opposed to other potential routes) was determined. This information will provide the public and the decision maker with a clear understanding of the rationale for the development of that particular component of the preferred alternative.

28-10 Additionally, the EIS presents no information related to the affected environment (land ownership, natural resources) associated with the "reroute"portion of Segment A nor does it include an assessment of effects along that stretch of the proposed transmission line. We recommend that the EIS be revised to include information related to the affected environment along with an assessment of effects for the "reroute"segment of Alternative A, consistent with

28-10 cont. the direction of the NEPA implementing regulations (see 40 CFR 1500.1, 1502.15, and 1502.16).

Segment B

28-11 The EIS presents distinctly different alignments for Segment B (entitled B_{North} and B_{South}) but, as with the Segment A Reroute, the EIS does not discuss why these different routes are being considered or how they were developed/determined. We presume that B_{North} was selected for evaluation because it would parallel an existing transmission line. However, we are unable to determine why the B_{South} route is being evaluated or potentially necessary, particularly when the affected environment and project effects are characterized as being essentially the same for both alignments. We recommend that the EIS be revised to clearly describe the reason(s) why these "subalternatives" are being evaluated and how those particular alignments (as opposed to other potential routes) were determined. This information will provide the public and the decision maker with a clear understanding of the rationale for the development of a particular component of the preferred alternative ($_{BSouth}$).

Public Comments

7

U.S. Environmental Protection Agency Rating System for
Draft Environmental Impact Statements
Definitions and Follow-Up Action*

Environmental Impact of the Action

LO - - Lack of Objections

The Environmental Protection Agency (EPA) review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC - - Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce these impacts.

EO - - Environmental Objections

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no-action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU - - Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact Statement

Category 1 - - Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis of data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2 - - Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses or discussion should be included in the final EIS.

Category 3 - - Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the National Environmental Policy Act and or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

* From EPA Manual 1640 Policy and Procedures for the Review of Federal Actions Impacting the Environment. February, 1987.

Kuehn, Ginny -KC-7

From: Wittpenn, Nancy A - KEC-4
Sent: Monday, April 22, 2002 12:39 PM
To: Kuehn, Ginny -KC-7
Subject: FW: Schultz-Hanford Transmission Project Comments

schultzhanford_sig.wpd schultzhanford_sig.doc

see below. Can you log this in and route. Thanks. They sent it in Word Perfect but I have also include a WORD version.

-----Original Message-----
From: Ryan.William@epamail.epa.gov [mailto:Ryan.William@epamail.epa.gov]
Sent: Friday, April 19, 2002 3:46 PM
To: nawittpenn@bpa.gov
Subject: Schultz-Hanford Transmission Project Comments

Hi Nancy-

Attached are our comments on the draft EIS prepared for the Schultz-Hanford Transmission Area Transmission Line project. I appreciate your willingness to accept these beyond the close of comments date. I hope that they are timely enough for you to include and address in the final EIS.

The file is a WordPerfect document. Hope you can read it. If not, let me know and I will send it in a format that will work for you. A signed, hard copy will be sent to you thru the mail, though it probably won't leave here until Monday.

Feel free to call if you have any questions.

Thanks for your patience.
Bill Ryan
(206) 553-8561

(See attached file: schultzhanford_sig.wpd)

1

Public Comments

-----Original Message-----
From: Ken Jacobson [mailto:KenJ@liberty.seanet.com]
Sent: Tuesday, April 30, 2002 5:27 PM
To: Lou Driessen / Project ManagerSchultz-Hanford Transmission Project
Cc: Senator Harold Hochstatter
Subject: TNP-TPP-3: (Schultz-Hanford) Public Comment

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-029
RECEIPT DATE: MAY 02 2002

Dear Mr. Driessen;
April 30, 2002

I own five and a half acres on the Columbia River approx. one mile north and east of the Wanapum Dam.

I am in the gruling political process of trying to build a permanent home on the site. The Grant County PUD enjoys an above ground power line easement across the northern portion of my property to run a power line underwater westernly to the park on the other side of the river.

When I purchased the property I was assured I had the right to take water from the Columbia because I could and did transfer a Department of Ecology Surface Water Permit #S3-28794.

Recently I was denied an easement per my Land Use Permit Application.

The reason sited by Sheryl Dotson, a Grant County PUD Lands Specialist was...

"Land use permits may be issued if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project.

"District staff will not be approving your request to place the irrigation structure across shoreline properties. The District believes the recreation use, and the scenic and environmental value of the shoreline adjacent to the Wanapum Beaches residential subdivision would be diminished by placement of an irrigation structure."

Ms Dotson further stated she had mutually rejected my plan with her supervisor Nancy Craig. I asked Ms Craig and Ms Dotson to review their decision (in a letter dated Feb. 4, 2002) because of erroneous conclusions in Ms Dotson letter. I did not ask for an "above ground"

1

installation... In fact the pipe has been buried into the river for over six years. I also do not believe Ms Dotson had ever been on the property. To date I have not received a response from either.

You are asking for comments to build a 500-kV transmission line...

I am asking permission to use an underground withdrawal pipe on 30 to 40 feet of PUD property that has been buried underground and underwater for over six years.

29-1 IS THE GRANT COUNTY PUD GOING TO APPLY THE SAME STANDARDS AND GUIDELINES TO YOUR TRANSMISSION LINE REQUEST AS THEY APPLY TO MY REQUEST?

If they are you, better look for another way to transfer power.

Ken Jacobson
#10 Wanapum Beaches
P.O. Box 36
Redmond, WA 98073
(425)-985-3682

2

Public Comments

B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS – 030
MAY 13 2002

Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement

Comment Form

30-1

1. What are your comments on the Preferred Alternative? The preferred alternative is fine except for the Sickler re-route. Our home is located on property that will be affected by this action. Please reconsider the point at which the reroute angles northeast after leaving Shultz. Please locate this point farther

2. What are your comments on other alternatives? east ~~[illegible]~~ so the line doesn't cross the Puget line where you propose currently. It would have a very adverse affect on our view to have this line cross the meadow below our house and have a

3. I need more information about new tower on the beautiful columnar basalt bluff that I enjoy meditating on as I do dishes! (The rattlesnakes would appreciate it too!)

4. Additional comments Thank you for your consideration. Sincerely, Melinda Arnold

☐ Please put me on your project mailing list. (You are already on the mail list if you have received mailed notice.)

☐ Please remove me from the project mailing list.

Name Melinda & Frank Arnold

Address 14442 Wilson Creek Rd

Please send comments by March 25, 2002 to:

Bonneville Power Administration
Public Affairs Office - KC
P.O. Box 12999
Portland, OR 97212

BONNEVILLE

B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS – 031
MAY 13 2002

Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement

Comment Form

31-1

1. What are your comments on the Preferred Alternative? My opinon on The Prefered Route is That it should follow The existing Route as close as Possible ~~with existing Route~~ with-out any Diviations.

31-2

2. What are your comments on other alternatives? The other Alternatives Do not seem plausible or Financially Resonible either for us as Land owner or The B.P.A.

3. I need more information about

31-3

4. Additional comments As a Land owner I Do not agree with any Alternate Routes or Diviations of This power Line

☐ Please put me on your project mailing list. (You are already on the mail list if you have received mailed notice.)

☐ Please remove me from the project mailing list.

Name Kevin K Barnhart - Land owner + Rancher, Barnhart + Sons Ranch

Address 1790 colockum Rd.

Please send comments by March 25, 2002 to:

Bonneville Power Administration
Public Affairs Office - KC
P.O. Box 12999
Portland, OR 97212

BONNEVILLE

Public Comments

BONNEVILLE POWER ADMINISTRATION

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-032
RECEIPT DATE:
MAY 1 3 2002

Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement

Comment Form

32-1
1. What are your comments on the Preferred Alternative? We're immediately south of The substation off ~~[illegible]~~ west of Wilson Creek Road. It appears that none of The alternatives will affect us

2. What are your comments on other alternatives?

3. I need more information about

4. Additional comments

☒ Please put me on your project mailing list. (You are already on the mail list if you have received mailed notice.)

☐ Please remove me from the project mailing list.

Name [illegible]

Address [illegible] Ellensburg, WA [illegible]

Please send comments by March 25, 2002 to:

Bonneville Power Administration
Public Affairs Office - KC
P.O. Box 12999
Portland, OR 97212

BONNEVILLE POWER ADMINISTRATION

RECEIVED BY BPA
LOG#: SHDEIS-033
RECEIPT DATE:
MAY 1 3 2002

Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement

Comment Form

1. What are your comments on the Preferred Alternative?

2. What are your comments on other alternatives?

3. I need more information about

33-1
4. Additional comments Before entering property - Please call - 925-3576 - This includes appraisers, environmental people and R.R.

☐ Please put me on your project mailing list. (You are already on the mail list if you have received mailed notice.)

☐ Please remove me from the project mailing list.

Name Bud Dunning

Address 3990 Brick Mill Rd Ellensburg

Please send comments by March 25, 2002 to:

Bonneville Power Administration
Public Affairs Office - KC
P.O. Box 12999
Portland, OR 97212

Public Comments

B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement

Comment Form

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS – 034
RECEIPT DATE: MAY 13 2002

1. What are your comments on the Preferred Alternative?

2. What are your comments on other alternatives?

3. I need more information about

34-1
4. Additional comments
[illegible handwriting]
Please do not bring anymore
[illegible handwriting]
transmission lines through our
[illegible handwriting]
Valley – There are Many Indian
[illegible handwriting]
sides in that area that need to be
~~[illegible]~~ respected – by you – by us.

☐ Please put me on your project mailing list. (You are already on the mail list if you have received mailed notice.)

☐ Please remove me from the project mailing list.

Name [illegible]

Address 404 [illegible]

Please send comments by March 25, 2002 to:

Bonneville Power Administration
Public Affairs Office - KC
P.O. Box 12999
Portland, OR 97212

BONNEVILLE

B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

Schultz-Hanford Area Transmission Line Project Draft Environmental Impact Statement

Comment Form

RECEIVED BY BPA
PUBLIC INVOLVEMENT SHDEIS–035
RECEIPT DATE: MAY 13 2002

35-1
1. What are your comments on the Preferred Alternative? The preferred route through the Sage brush lands should be the route for the new line. This will have the least impact on the ~~[illegible]~~ Valley residents.

35-2
2. What are your comments on other alternatives? The alternate route is not good. This route will have a very negative affect on Some of Ellensburgs most prestine ranches.

3. I need more information about

35-3
4. Additional comments
The BPA should not reroute the ~~pretty~~ preferred route to preserve the native lands at the expense of non native lands and non native residents.
The BPA. should pay the price to the natives to keep the lines on the preferred route

☒ Please put me on your project mailing list. (You are already on the mail list if you have received mailed notice.)

☐ Please remove me from the project mailing list.

Name Pery Savage

Address 808 So. Main Ellensburg, Wa 98926

Please send comments by March 25, 2002 to:

Bonneville Power Administration
Public Affairs Office - KC
P.O. Box 12999
Portland, OR 97212

BONNEVILLE

Public Comments

TRANSMISSION AGENCY OF NORTHERN CALIFORNIA

P.O. Box 15129, Sacramento, CA 95851-0129 (916) 852-1673

February 20, 2002

RECEIVED BY BPA
PUBLIC INVOLVEMENT
LOG#: SHDEIS-036
RECEIPT DATE:
MAY 1 6 2002

Mr. Lou Driessen
Project Manager
Bonneville Power Administration
P. O. Box 491
Vancouver, WA 98666-0491

Subject: Schultz-Hanford Area 500-kV Transmission Line Project

Dear Mr. Driessen:

The Transmission Agency of Northern California (TANC) would like to express its support of the proposed Schultz-Hanford Area Transmission Line Project. As the project manager for the California-Oregon Transmission Project (COTP), which was energized in 1993, TANC and its 15 utility Members and our other COTP Participants utilize the Interties to buy, sell, and exchange power with the Pacific Northwest (PNW). The Schultz-Hanford Area Project should significantly improve the grid capabilities to the PNW.

36-1 Therefore, TANC strongly supports BPA's goal to maintain system reliability and optimize transmission usage through the construction of the Schultz-Hanford Transmission Project. We support completion of this project at the earliest practical date.

Sincerely,

James H. Pope,
Chairman

A Public Entity whose Members include:
Alameda, Biggs, Gridley, Healdsburg, Lodi, Lompoc, Modesto Irrigation District,
Palo Alto, Plumas-Sierra Rural Electric Cooperative, Redding, Roseville,
Sacramento Municipal Utility District, Santa Clara, Turlock Irrigation District, Ukiah

SCHULTZ-HANFORD AREA TRANSMISSION LINE PROJECT
Ellensburg, WA
February 26, 2002 4 – 7 pm
Hall Holmes Community Center, 201 Ruby Street

EL-1 Would like construction to occur outside times of increased moisture.

EL-2 Naneum Creek has sustained flow throughout year. (low flow Aug-Nov)

EL-3 The crossing of creek near my property (sheet 3 of aerial photomaps) should not be used as a continued use crossing.

EL-4 Instrument approach to Runway 11-29 far SE end of approach affected by elevation change. Will the elevation of the towers affect the approach onto Bowers field?

EL-5 Rattle snake dens near Wilson Creek, have they been taken into consideration?

EL-6 We don't like the re-route around the tribal allotment.

EL-7 Nap weeds need to be taken care of on Coulee line.

EL-8 Did the landowner declare an objection during the scoping period?

EL-9 How many acres will Wautoma take?

EL-10 The preferred route will be the easiest to build.

EL-11 We have many pumps on our farm land and like having power to them.

EL-12 Concerned about re-route thru property.

EL-13 Sickler-Schultz goes right by our house. Can we move it more to the west to avoid our house? We really don't want the line where you propose. Will our comments really be considered? My dad lost his land to Schultz Substation.

EL-14 Do we have to go around Indian land?

EL-15 We don't like the re-route around the tribal allotment. (x3)

Ellensburg, WA February 26, 2002

Public Comments

EL-16 Are there any plans west of Schultz Sub within the next 10 to 20 years?

EL-17 Why aren't lines being double circuited in other areas in addition to irrigated areas?

EL-18 Why was Schultz sub constructed?

EL-19 How much more power will this line bring from Grand Coulee?

EL-20 Where will the line be located with regards to Cooke Canyon?

EL-21 Doesn't want anymore power lines on property. Land will lose its value with another transmission line for recreational building site.

EL-22 Appraisers were insulting to landowner when doing appraisal. They said land wasn't worth much.

EL-23 Third generation landowner doesn't want another power line, if power line wants total buy out of 160 acres.

EL-24 When entering property, BPA and it's contractors should call first.

EL-25 County Commissioners have not been met with yet, would like meeting.

EL-26 Regarding route around tribal allotment, Cooke/Coleman Ranch recently paid to bury powerlines on property so he wouldn't see it anymore. Now he would have to see two high voltage lines.

EL-27 Why route around the tribal allotment at all. There are no cultural uses of that property.

EL-28 The existing line loses a lot of power - noise and losses. Why not reconductor the existing line while we're at it?

EL-29 Why not double circuit the existing line and the new line?

EL-30 Concerned about access roads. Worried about public using roads. Any roads installed are a problem, gates and fences can be hard to maintain.

EL-31 BPA people do not close gates behind them.

Ellensburg, WA February 26, 2002

EL-32 Why don't studies address the density of human population, in relation to the line?

EL-33 Why can't we double circuit all of the lines?

EL-34 What are the differences in tower types? Is one better then the other?

EL-35 Is there a map that shows the tower location?

EL-36 Will someone be contacting landowners to compensate for easement?

****

Ellensburg, WA February 26, 2002

Public Comments

SCHULTZ-HANFORD AREA TRANSMISSION LINE PROJECT
Desert Aire, WA
February 27, 2002 4 – 7 pm
Sage Brush Senior Center, 441 Desert Aire Drive

DA-1 Winter is the best time for construction through irrigated area. Orchards: Oct.- March 1, Vineyards: mid Oct.- March 1, and Row Crops: Oct. - March 1

DA-2 Noise is an issue - Use best design to reduce magnetic/electric fields.

DA-2 OK with real paralleling, like the preferred does.

DA-2 BPA is doing a real good job of Public Involvement.

DA-2 Preferred route is best.

DA-3 Stay parallel.

DA-4 Keep towers adjacent to existing, at Crab Creek.

DA-5 When will we know tower locations?

DA-6 Stay away from sensitive plants.

DA-7 Thru agriculture / irrigation stay in same existing right-of-way and replace existing towers with new larger towers. Agrees with preferred.

DA-8 Move, if possible, new towers next to roads.

DA-9 Double circuit through irrigated areas is preferred.

DA-10 Include insulators on transmission lines, where they cross roads (on both sides of road).

DA-11 Federal purchase of private land (i.e., Wautoma site) reduces tax income to Counties and State. How do we compensate for lost income?

DA-12 Wants to connect wind farm from 75 MW near Wautoma.

Desert Aire, WA February 27, 2002

DA-13 50-75 feet of is right-of-way (Railroad Easement) along river (Westside) - Auvil Ranch to Midway.

DA-14 Look at using an alternative on westside along abandoned railroad along Columbia River. Currently being used to herd cattle.

DA-15 Concerned line will go through orchard.

DA-16 Will lines be going into Vantage Substation or Midway Substation?

DA-17 Suggestion: All BPA employees at open house be provided with BPA 1090 shirts at BPA's expense.

DA-18 Concerned about route of preferred route.

DA-20 Will there be a mitigating plan prepared for the agricultural farms where the line crosses?

DA-21 Do the lights on towers at the Columbia River crossing meet FAA requirements?

DA-22 Check map in regards to refuge and private land.

DA-23 When are the cultural resource surveys scheduled to begin?

DA-24 Who will be contracted to perform the cultural resource surveys?

****

Desert Aire, WA February 27, 2002

Public Comments

SCHULTZ-HANFORD AREA TRANSMISSION LINE PROJECT
Richland, WA
February 28, 2002 4 – 7 pm
Richland Days Inn, 615 Jadwin Avenue

RI-1 What are the proposed energization dates of the G-9 projects?

RI-2 Minimize impact on scrub steppe (microbolic crust), during construction and foot print of the line. --- It's disappearing, doesn't re-grow when disturbed.

RI-3 There needs to be a map in the Executive Summary.

RI-4 Lower Columbia Audubon Society is mostly concerned with the Hanford Monument.

RI-5 Preference is that BPA does not cross the Monument at all.

RI-6 Second preference is to use the same footprint as the existing across the Monument. i.e.. Double Circuit.

RI-7 Maps are not accurate. The Hanford Reservation is labeled as the Monument.

RI-8 Maps are confusing.

RI-9 BPA needs a map that shows the preferred route crossing the Monument.

RI-10 There's no specific reference to affected resources that are identified to be on the Hanford Monument.

RI-11 BPA needs to make special care to protect the Hanford Monument resources. Resources are: Habitat, Wildlife, and Visual.

RI-12 BPA needs to work very closely with US Fish & Wildlife.

RI-13 The executive summary should be re-issued for a Draft Review with maps.

RI-14 BPA is continuing to affect habitat and must mitigate for habitat loss. Replacement of shrub steppe habitat in Benton County, by the McWhorter Ranch.

Richland, WA February 28, 2002

RI-15 Executive summary is kind of confusing.

RI-16 Once land is made invaluable, would BPA like to buy property?

RI-17 Glad that alternative 3 is not being used.

RI-18 BPA should do formal hearings.

RI-19 Contact DOE in reference to the LIGO (Laser Interfermetric Gravitational Observatory) Operations.

****

Richland, WA February 28, 2002

This page left blank intentionally.

Responses to Comments

1-1
Comment noted.

1-2
Thank you.

2-1
Comment noted.

3-1
Comment noted.

4-1
Comment noted. As stated more clearly in Chapter 2 of the FEIS and Appendix B, the Segment A Reroute is not preferred.

5-1
Although your property is located in the general vicinity of the proposed alternatives, your property is not crossed by any of the alternatives. For the Preferred Alternative, your property is located approximately 1 1/2 to 2 miles west of the proposed Wautoma Substation.

6-1
Segment A has not changed because of the cultural resource area shown on the map you refer to. The Segment A Reroute was introduced because of anticipated difficulties in acquiring the right-of-way (ROW) for the new line and renewing the ROW for the existing Schultz-Vantage line across a tribal allotment. Please see Appendix B for more detail on the Segment A Reroute.

6-2
Thank you.

7-1
The existing line passing through Sec. 27, 28, Range 19, Township 19 is the BPA Vantage - Schultz 500-kilovolt (kV) line. The new line from Schultz Substation to Wautoma Substation would be a 500-kV line designed to minimize corona on the conductors. Corona is the source of audible noise, visible light, and a small power loss during foul weather. The new line would use a bundle of three conductors suspended from each insulator as opposed to the single large (2.5″) conductor on each insulator for the existing line.

Thus, the new line would be much quieter (14 decibels (dBA) less at the edge of the right-of-way) during foul weather than the existing line. This reduction would be perceived as more than a halving of the noise level. Because of reduced corona levels the conductors of the new line would be less visible during foul weather. Corona loss is localized very near the conductors and does not affect persons or animals on the ground except through perception of either audible noise or visible light.

Nuisance shocks can occur when touching fences under or near 500-kV transmission lines if the person or the fence is not completely grounded. During construction BPA grounds fences and other metal objects on the ROW to eliminate them as sources of nuisance shocks. However, someone wearing insulating shoes can still perceive a nuisance shock when touching a grounded object such as a fence. Similarly, a person could perceive a nuisance shock when touching a vehicle on insulating tires.

Safety of persons and animals is not compromised as long as a safe distance is maintained from the conductors. Thus, irrigation pipes and other long objects should be carried horizontally under the 500-kV or any electric lines. Such long objects should not be tipped up under the lines. Similarly, to prevent a direct path for electricity to flow to ground, direct streams of water should not be sprayed on the conductors.

BPA provides guidance on how to live and work safely near high-voltage transmission lines in their publication "Living and Working Around High-Voltage Power Lines" (DOE/BP-799), 1995, Portland, OR. Please contact BPA to receive a copy, or if you have questions about safety near transmission lines.

7-2
The Preferred Alternative includes locating the new line north of the existing line. As demonstrated in meetings and comments, most people preferred this location. The north side also minimizes the number of 500-kV line crossovers.

Due to existing industry criteria (North American Electric Reliability Council) concerning transmission system reliability, BPA cannot double-circuit two 500-kV transmission lines on the same structure. Structure failure or lightning could remove both circuits from service at the same time. Because 500-kV lines are the backbone of the region's transmission system, any unplanned removal of 500-kV lines from service presents a very big problem for the Pacific Northwest and beyond. Also, the cost to double-circuit is almost double that of a single-circuit line.

7-3
BPA would need to acquire easements to build, operate and maintain the proposed transmission line facilities. Landowners would be contacted and offered fair market value for the easements, which would be established through the appraisal process. The appraisal process takes all factors affecting value into consideration, including the impact of transmission lines on property value. It may also reference studies conducted on similar properties to add support to valuation considerations.

8-1
Comment noted.

8-2
Please see Response 7-2.

9-1
Comment noted.

9-2
BPA agrees. The land use section in Chapter 4 identifies the same problems.

9-3
Thank you for your understanding of the issues.

10-1
BPA agrees.

10-2
One of the primary reasons to construct a new 500-kV substation at Wautoma is to eliminate the critical Hanford-Ostrander 500-kV/Hanford-John Day 500-kV double line loss. Both of these lines parallel each other on adjacent ROW for approximately 19 miles. Looping both of these lines into Wautoma allows for a transmission path to be maintained from Schultz to Ostrander and John Day in the event of a Hanford-Ostrander 500-kV/Hanford-John Day 500-kV double line loss.

Upgrading the existing Benton REA 115-kV Blackrock distribution substation was not considered because an additional 4 miles of new 500-kV line would need to be constructed to extend the existing Hanford-John Day 500-kV line to Blackrock.

10-3
Due to existing industry criteria (North American Electric Reliability Council) concerning transmission system reliability, BPA cannot double-circuit two 500-kV transmission lines on the same structure. Structure failure or lightning could remove both circuits from service at the same time. Because 500-kV lines are the backbone of the region's transmission system, any unplanned removal of 500-kV lines from service presents a very big problem for the Pacific Northwest and beyond. Also, the cost to double-circuit is almost double that of a single-circuit line.

BPA can double-circuit 500-kV lines with lower voltage lines (for example, a 230-kV line). Because this double-circuit design also reduces transmission system reliability and is more costly, BPA prefers to keep these double-circuit segments as short as possible and to a minimum.

Along Segment D, BPA has proposed to double-circuit the new 500-kV line and the existing BPA Midway–Vantage 230-kV line for 8 miles between structures 11/1 and 2/4 of the existing Midway-Vantage 230-kV line. This design would minimize long-term impacts to nearby residences and irrigated agriculture (center pivot systems, orchards, and vineyards). However, this design would not minimize the amount of short-term impacts and construction disturbance. In most cases, the new double-circuit tower would not be located in the exact location of the existing single-circuit tower; rather it would be located approximately 50 feet ahead or behind along the line. The body of the single-circuit tower would be removed (below the surface, the footings would remain) and the ground would be made available for cultivation. Using the double-circuit towers in the agricultural area would result in a negligible loss of land that can be cultivated. In non-agricultural areas, the double-circuit design would create the same amount or more construction disturbance (removal of the single-circuit tower and construction of the double-circuit tower within 50 feet of the existing single-circuit tower) to shrub-steppe vegetation than building a parallel single-circuit line.

Beyond the 8-mile area mentioned above, both north and south of the double-circuit section, BPA has proposed to locate the new line parallel and adjacent to the existing 230-kV line. BPA would try to avoid, where possible, impacting sensitive environmental resources such as plants, animals, habitat, and cultural resources by locating structures and new access roads away from these areas. Existing access roads would be used and only short spur roads would be constructed to each new structure site. BPA realizes that some impact to environmental resources may be unavoidable. In these cases, BPA has proposed mitigation to minimize these impacts. For example, to minimize impacts to birds BPA would use flat configuration structures (see Chapter 2 for an illustration) in some areas to lower structure height and keep all conductors on the same level. Bird flight diverters would be placed on overhead groundwire to help minimize potential avian collision. Construction would be timed to avoid nesting or spawning periods. More mitigation is identified in Chapter 4 within each resource section.

10-4
As you say, BPA does have experience in the area of fire and weed control. BPA and/or their contractors coordinate with local counties on fire and weed control activities. BPA contractors who conduct weed surveys and eradicate weeds are experts in their field. Section 4.3.8.4 identifies efforts that would be made to minimize the introduction and spread of weeds. These activities and practices would be included in a Weed Management Plan for the project. In addition, BPA would use the procedures outlined in BPA's *Transmission System Vegetation Management Program Record of Decision* (August 2000) to address weed problems in subsequent maintenance activities. This document is available for review at:

http://www.efw.bpa.gov/cgibin/PSA/NEPA/SUMMARIES/VegetationManagement_EIS0285

Contractors hired by BPA to construct the new line and access roads would implement measures for fire prevention and fire suppression preparedness in the project area as required by applicable laws and regulations. In Benton County, contractors would also maintain close contact with U.S. Fish and Wildlife Service (USFWS) officials who monitor fire danger levels for the general area and have vehicles that carry fire suppression equipment. More detailed information about fire preparedness is in Section 4.11.5.

BPA plans to revegetate disturbed areas with appropriate seed mixes. BPA would use off-the-shelf seed mixes appropriate for most of the new ROW. For sensitive areas along the new ROW, particularly on the YTC, Saddle Mountain, Columbia National Wildlife Refuge, and the Hanford Reach National Monument, BPA is coordinating with the USFWS, the BLM, and the YTC to define these areas and appropriate seed mixes. BPA is concerned that enough of this seed mixture is available for application after construction would begin. Some seed may need to be collected, grown, and harvested for this purpose.

10-5
Mitigation for shrub-steppe habitat is described in Sections 4.3.8 and 4.4.10.

As additional mitigation for native habitat, BPA is presently reviewing a proposal by the USFWS for restoration of native habitats of the Columbia Basin shrub-steppe ecosystem. BPA is considering purchasing property or contributing to ongoing agency programs/efforts to restore native habitat.

10-6
The absence of a map in the Summary document was an oversight during the printing of the document. Map S-1 in the stand-alone DEIS Summary was the same as Map 2 in the DEIS. We apologize for the inconvenience of not having a map in the DEIS Summary. As an alternative, the full DEIS was available for review. The DEIS included all maps and a full description of the alternatives, affected environment, and associated impacts.

10-7
The Hanford Site was mislabeled as Hanford Reach National Monument on many of the maps in the DEIS. This has been corrected in the FEIS. Because of the map scale, it was easier to identify the Hanford Reach National Monument on Map 8, which details that area.

11-1
Comment noted.

11-2
BPA understands the importance of riparian trees to the ecology of the stream and surrounding land. BPA would only remove those trees that present a safety hazard to the operation of the new transmission line. The BPA Forester has looked at each riparian area and completed a preliminary assessment of the trees to be removed. The factors taken into consideration were transmission line voltage, tree species, height and growth rates, ground slope, conductor elevation above ground, and clearance distance required between the conductors and other objects. A total of approximately 33 trees would be removed from within riparian areas. Section 2.2.3 *Clearing* in this document details the number of trees at each of the five different creeks that would require clearing.

11-3
BPA does not condone unauthorized public use of its access roads and ROW. BPA would work with private and public landowners to install gates and fencing where needed to discourage unauthorized public use.

11-4
Please see Response 11-3. No fords will be constructed for the proposed project. An existing improved ford will be used on Johnson Creek. Access to the project on other streams that currently have fords such as Wilson/Naneum and Caribou Creeks will be from either side of the streams and these fords will not be used.

11-5
A series of rare plant surveys (August 21-23, 2001, April 9-12, May 8-18, May 22-26, June 11-13, July 17-19, and July 24-25, 2002) have been conducted for the proposed ROW and access roads along the Preferred Alternative (Segments A, B_{SOUTH}, and D) to identify populations of federally-listed threatened and endangered plant species and state listed plant species. This information will be used to avoid, where possible, locating new structures or access roads within or near these populations. A field reconnaissance was done for the fiber route. Since no new roads would be built, no impacts to plants would occur. Another survey of the Hanford Monument will take place in Spring 2003 to identify populations of sensitive plants for survey areas, tower sites, and access roads.

11-6
Please see Response 10-4.

11-7
The project botanist has been alerted to the presence of *Iliamna longisepala* near the proposed crossing of Naneum Creek.

12-1
Comment noted. Thank you for the feedback that the public meeting was helpful and informative.

12-2
Please see Response 12-1.

13-1
Comment noted.

13-2
You are correct, although the new tower footprint would be slightly larger due to the larger tower.

BPA is working closely with landowners along Segment D to determine whether tower locations need to be moved to improve existing situations. BPA worked with the tenant of the southeast quarter section and was able to adjust the placement of the towers on the circle boundary to better accommodate farming.

13-3
BPA would work with the WDNR to discuss ROW easements on state trust lands affected by the project.

14-1
BPA contracted with the Yakama Nation to conduct an intensive on-the-ground cultural resource survey that began on April 22, 2002. The survey included the Preferred Alternative ROW, proposed access roads, and disturbed areas from fiber optic installation. Because Cooke-Coleman LLC refused BPA and its contractors entry to their property (see Response 17-5), a survey of the Segment A Reroute could not be done. The results of the cultural resource survey are summarized in Chapters 3 and 4 of the FEIS.

14-2
Please see Response 14-1.

14-3
Please see Response 14-1.

As clearly stated in Appendix B of the FEIS, the Segment A Reroute is not part of the Preferred Alternative. If it was and BPA chose to construct the Preferred Alternative, a cultural resource survey along the Segment A Reroute would be conducted prior to construction.

14-4
The DEIS contains the same level of detail for all alternatives. This information is a combination of existing information and field reconnaissance. Detailed field studies were not completed for the alternatives in the DEIS. With over 160 total miles, this would be cost-prohibitive. Detailed wetland, botanical, wildlife, cultural resource, and weed field studies were completed for the Preferred Alternative and are summarized in the FEIS. The Segment A Reroute is not included in the Preferred Alternative. If further surveys are required, they would be completed during the survey season of 2003.

Also, please see Responses 14-1 and 14-3.

15-1
Rights-of-way acquired by BPA for this project would be federally held. Any land acquired for the building of a substation would be owned by the federal government in fee.

15-2
The proposed project is a federal project owned, operated, and maintained by BPA. Therefore, obtaining county-level critical areas ordinance and zoning reviews would not be required. BPA would work towards meeting or exceeding the substantive standards and policies of the county zoning and critical area ordinances and comprehensive plans.

15-3
Existing roads and existing stream crossings would be used where practicable. Sensitive areas have been identified in the field, including wetlands. New towers and access roads have been located so as to avoid sensitive areas to the greatest extent possible. BPA would design stream crossings to minimize impacts, as suggested.

16-1
The site-specific details that are referenced were unavailable at the time the DEIS was prepared. BPA has now located towers and access roads along the Preferred Alternative, and field surveys have been conducted. More detailed information on the Preferred Alternative was used to update the FEIS.

16-2
Please see Response 10-3.

16-3
BPA will submit a Joint Aquatic Resources Permit Application (JARPA) to obtain a Hydraulic Project Approval (HPA) from the WDFW, as required. 10 perennial streams or rivers are crossed by the project. Only one of these streams will require crossing improvements. Schnebly Creek will require the replacement of an undersized culvert on the existing BPA access road. This culvert replacement will be done during either the WDFW primary or secondary preferred in-water work window of July 15-August 15 or June 15-July 15. The reach of Schnebly Creek where the existing road crosses is usually dry during this time. Towers placed on either side of the remaining nine perennial creeks or rivers will be accessed from either side or by using existing culvert or bridge crossings. Many intermittent or ephemeral streams will require culvert replacement or the addition of crushed rock at existing or new crossings. BPA will review the project with the state designated biologist and design crossings according to HPA requirements. JARPA permits would include design details and identify any additional mitigation that may be required.

16-4
Comment noted.

16-5
Please see Response 16-3.

16-6
Please see Response 16-3.

16-7
BPA will prepare the necessary documents, drawings, and photographs for each crossing, as required. In addition, BPA would like to conduct a field review with WDFW to ensure that BPA and WDFW both understand the crossing designs and potential associated issues.

16-8
The level of wetlands work done for the DEIS consisted of a review of available information and a field reconnaissance of the area to determine the presence/absence of wetlands and to estimate their extent. The design process for the Preferred Alternative and further wetland field review has provided the level of detail to further analyze impacts and make design adjustments in order to avoid impacts to wetlands where practicable.

Access road design involved environmental specialists working with the road engineer to determine if the current design would impact any wetlands and moving access roads where possible to avoid impacts.

A wetland delineation has been completed for the few unavoidable wetland impacts. A permit application for these impacts is being prepared and will be submitted to the U.S. Army Corps of Engineers, Washington State Department of Ecology, and other appropriate agencies in accordance with the Clean Water Act.

16-9
Comment noted.

16-10
BPA has tried to acknowledge cumulative impacts in each resource discussion in Chapter 4. BPA agrees that this is a difficult area of assessment. Cumulative actions/impacts refer to past, present, and future foreseeable actions/impacts. While the past and present are obvious, what impact future actions might have on a resource is difficult to predict. Please see Response 10-5.

16-11
Please see Response 10-5. The quantities for areas disturbed by the project have been updated in the FEIS.

It is difficult for BPA to take a broad overview of total impacts associated with all of BPA's projects. Even though BPA is working on several projects at the same time, it is unknown which of the projects will actually be constructed. Several of the projects are a result of new generation facilities. If these generation facilities are not constructed (as of this printing, several of these projects have been put on hold), the associated BPA-portion of the project also goes away. Financing is also different from one project to another. Sometimes, financing comes from a third party. BPA plans to finance the Schultz-Hanford Area Transmission Line Project. Due to the critical nature of each project, each project stands on its own merit. Mitigation is usually associated with one project only. BPA is presently exploring the opportunity to combine mitigation efforts with one other transmission line project in Eastern Washington. This might involve restoration or protection efforts.

17-1
Mr. Jeff Slothower (attorney with Lathrop, Winbauer, Harrel, Slothower & Denison L.L.P.), representing Cooke Coleman LLC (manager and sole member to be Mr. Gaylord Kellogg), contacted

the Bonneville Power Administration on July 11, 2001, requesting more information on the location of the proposed new transmission line in relation to his client's property. At that time, BPA was not proposing a reroute, referred to as the Segment A Reroute, and Mr. Slothower was informed that the new line was proposed to be north of the existing line. The new line would not cross Cooke Coleman LLC property. BPA answered Mr. Slothower's questions and agreed to fulfill his request to be added to the mail list to receive future mailings and meeting notices.

By October 2001, BPA decided to study a reroute around the tribal allotment. Because the Segment A Reroute was not proposed until October 2001, no information concerning this reroute would have appeared in the Notice of Intent (November 9, 2000) or four letters sent to the public (December 12, 2000, March 26, 2001, June 6, 2001, and July 30, 2001). The Segment A Reroute could not have been included in the scoping notice, scoping meetings, and four letters sent to the public, because it was not proposed at that time. Also, since the Segment A Reroute mostly crossed one private landowner's property, Cooke Coleman LLC, a letter was not sent to the entire mail list. Instead, a BPA representative contacted Cooke Coleman LLC's attorney (still Mr. Jeff Slothower) by phone on November 8, 2001 to personally discuss the Segment A Reroute and its potential to affect his client's property.

The BPA representative also indicated that BPA would be sending Permission to Enter Property (PEP) forms for his client to sign that would allow BPA permission to enter the property to conduct certain studies. The BPA representative recalls that Mr. Slothower agreed to send the forms to Mr. Gaylord Kellogg and added that his client would not be very happy about this new development. BPA sent a letter, referring to the telephone conversation, with the PEP forms attached to Mr. Slothower on November 8, 2001.

This was Cooke Coleman LLC and Mr. Gaylord Kellogg's first opportunity to learn of the Segment A Reroute.

17-2
As stated in Response 17-1, the Segment A Reroute could not have been included in the scoping notice, scoping meetings, and four letters sent to the public, because it was not proposed at that time. As described in Response 17-1, Cooke Coleman LLC's first opportunity to learn of the Segment A Reroute was on November 8, 2001, soon after BPA decided to study a reroute. BPA made both a personal telephone call and sent a letter to Mr. Slothower, who was the attorney representing Cooke Coleman LLC and Mr. Gaylord Kellogg.

BPA received a response letter from Mr. Jeff Slothower, dated November 20, 2001, stating that the information in BPA's November 8, 2001 letter had been forwarded and discussed with his client, Cooke Coleman LLC.

After contact was made and information exchanged with Cooke Coleman LLC, BPA continued to study the Segment A Reroute and, as required by National Environmental Policy Act (NEPA), included information in the DEIS describing this reroute. No other contact by Cooke Coleman LLC was made with BPA until availability of the DEIS was announced in the Federal Register and by letter. The Notice of Availability announcing the availability of the DEIS was published on February 8, 2002. Letters were sent to the parties on the mail list. A 45-day comment period for the DEIS, as required by NEPA, closed on March 25, 2002. BPA responded to Cooke Coleman LLC's request by e-mail on February 7, 2002 for copies of the DEIS to be sent via Federal Express.

17-3
As stated in Response 17-1, the Segment A Reroute could not have been included in the scoping notice or scoping meetings because it was not proposed at that time. BPA did not propose the Segment A Reroute until October 2001. As can happen with very large transmission projects like this one, an original proposal can change to accommodate new information. The Segment A Reroute was proposed in response to new information. Cooke Coleman LLC and Gaylord Kellogg were first notified of the Segment A Reroute on November 8, 2001. Mr. Kellogg had 45 days to comment on the DEIS, which was the same amount of time given to other landowners whose property was also proposed to be crossed by the new transmission line. A 45-day comment period is provided so that affected individuals can provide meaningful comment on the proposal.

In Mr. Kellogg's attempt to obtain public information from BPA, it is unfortunate that Mr. Kellogg and his second attorney, Mr. Harrel, waited until February 2002 (over 3 months after Mr. Kellogg's first notification by BPA of the Segment A Reroute) to send two Freedom of Information Act (FOIA) requests to BPA (February 12, 2002 and February 26, 2002) as this did not allow BPA enough time to fully respond to the FOIA requests before the close of the DEIS comment period on March 25, 2002. In responding to the FOIA requests, BPA needed to take 10-day working extensions, allowed by statute, to fully respond to both FOIAs. Partial responses were sent on March 15, 2002 and March 27, 2002. Final responses were sent on March 28, 2002 and April 10, 2002.

17-4
On March 20, 2002, BPA responded to Mr. Harrel's written request for BPA to prepare a supplemental DEIS. A portion of the letter is quoted here.

> "At this time, BPA does not intend to prepare a supplemental DEIS. BPA considers the description and analysis of the Segment A Reroute in the DEIS sufficiently detailed for public comment during the 45-day comment period that began on February 8, 2002. The possible re-routing of this approximate one-mile segment does not, in BPA's view, pose potentially significant impacts to the human environment. BPA recognizes that public comments received during the DEIS comment period allow an agency to improve its proposed action, thereby leading to better, more informed decisions. BPA looks forward to receiving comments on the Segment A Reroute and other portions of the project. All comments will be responded to in the Comment/Response section of the FEIS and appropriate changes will be made to the document at that time."

BPA has provided an explanation for proposing the Segment A Reroute and added additional information on the Segment A Reroute in Appendix B of the FEIS. A supplemental DEIS is not needed.

17-5
BPA's environmental team used a variety of methods to study the Segment A Reroute. Study methodology included field visits, aerial photography review, literature research and review, state and federal database queries, and contact with local, state, and federal agency representatives.

Field visits were restricted to observation of the Cooke Coleman LLC property from the nearest public access because Cooke Coleman LLC refused access to BPA. In BPA's November 8, 2001 letter to Mr. Slothower (Cooke Coleman LLC attorney), BPA attached Permission to Enter Property forms for his client's review and signature. These forms, when signed, would allow BPA access to the property to perform certain studies. Mr. Slothower's November 20, 2001 response letter served

> "as notice that Cooke Coleman LLC was not willing to grant BPA staff, employees, contractors, subcontractors, or others working for or on behalf of BPA access to the Cooke Coleman LLC property for any purpose. Accordingly, Cooke Coleman LLC is not signing the Permission to Enter Property forms you forwarded to me.
>
> Please also accept this letter as formal notice to the Department of Energy, Bonneville Power Administration, its employees, contractors, subcontractors, consultants, and any others working for or on behalf of the Department of Energy, Bonneville Power Administration, that they are not allowed to access any property owned by Cooke Coleman LLC. Furthermore, any access by Department of Energy, Bonneville Power Administration, its employees, contractors, subcontractors, consultants, and any others working for or on behalf of the Department of Energy, Bonneville Power Administration will be treated as a trespass by Cooke Coleman LLC."

BPA and its contractor environmental specialists conducted an analysis of the Segment A Reroute and included a description of the results of that analysis in Chapters 3 and 4 in the DEIS. Without access to the property itself, the scale of the aerial photography, details contained in available databases and in the literature, and limited detailed knowledge of private property from local, state, and federal agency representatives, BPA concluded in most cases that the impacts would be similar to those reported for Segment A. BPA has included additional language in Appendix B in the FEIS to help the reader better understand the Segment A Reroute impacts.

17-6
Please see Responses 17-5 and 17-7.

17-7
The description of the Segment A Reroute in the DEIS was not clear; an improved description has been included in Appendix B of the FEIS. The descriptions of the alternatives, including the Segment A Reroute, were written using common landmarks and were intended to accompany the maps in the DEIS. The maps were correct and were intended to provide interested persons or agencies with the locations of alternatives to the level of detail that BPA had available at the time the DEIS was printed.

17-8
BPA agrees that "southeast" should have been used in the description of Segment A Reroute instead of "south." This has been corrected in the FEIS. The map in the DEIS and FEIS clearly and correctly illustrates the Segment A Reroute. BPA disagrees with the commenter's implied conclusion that the entire impact analysis for the reroute is incorrect because the location description was slightly incorrect.

17-9
The Segment A Reroute is an option that can be chosen or not chosen to be added to Segment A. In the DEIS, each of the alternatives (Preferred Alternative and Alternatives 1, 1A, and 3) included Segment A without the Reroute as part of its alignment. Therefore, the text and tables that quantify the Segment A length in the DEIS did not include the Segment A Reroute. Please refer to Response 17-7 regarding the clarification made to the descriptions of alternatives.

17-10
Not mentioning the Segment A Reroute in the Summary was an oversight and has been corrected. The estimated cost of the Segment A Reroute has been added to the FEIS. As stated in Response 17-9, the optional reroute was not included in any of the alternatives. The Summary briefly describes overall impacts of the alternatives. The inclusion of impacts associated with the Segment A Reroute, which would add approximately one-quarter mile to Segment A, would not substantially change the overall impacts associated with the 58- to 70-mile alternatives.

17-11
The DEIS did not clearly describe the impacts of removing the existing Schultz-Vantage line and moving it to the south. This information has been added to Appendix B in the FEIS.

17-12
For the Segment A Reroute, 350 feet of new ROW would be needed for both the new and existing line (75 feet from the center line to the edge of the ROW for each line and 200 feet between the two lines). If the Segment A Reroute were chosen, the existing line that presently crosses the tribal allotment would be removed and constructed next to the new line across Cooke Coleman LLC property. Segment A Reroute is not preferred. A more complete description of these activities and an analysis of associated impacts have been added to Appendix B of the FEIS.

17-13
Clearing and access roads associated with the Segment A Reroute were not included in Sections 2.2.3 and 2.2.4 in the DEIS. A discussion of the clearing associated with towers and access roads for the Segment A Reroute has been added to Appendix B in the FEIS.

17-14
The Segment A Reroute would disturb approximately 4.1 more acres of land area than the original Segment A alignment described in the DEIS.

The construction of Segment A Reroute would disturb additional soil surface and have the potential for additional erosion, sedimentation, and runoff at or near Cooke Creek; impair soil productivity; and remove 0.3 acres of land from production.

The amount of riparian vegetation cleared under the Segment A Reroute would be less than or at most equal to that of the original route because the original route crosses a wider riparian area containing tall cottonwoods and willows that would need to be cleared. Only taller riparian vegetation such as cottonwoods and willows would need to be removed for conductor clearance purposes. The Segment A Reroute crosses 4 to 5 small channels with narrower areas of smaller riparian vegetation, most of which would likely not need to be cleared.

A search of the Washington Natural Heritage Program database and discussions with WDFW, WDNR, USFWS, and independent botanists and biologists did not indicate that the area of the Segment A Reroute harbored fish and wildlife species or plant assemblages unique to the region or substantially different than the original proposed route and surrounding areas (BPA was denied permission to enter the property to conduct detailed biological surveys). If the Segment A Reroute were to be chosen, the overall impacts (described for the original Segment A) on vegetation, wildlife, and fish would remain the same.

Appendix B in the FEIS contains a more detailed analysis of the Segment A Reroute.

17-15
Please see Response 14-1.

17-16
BPA has added more detail to the description of the Segment A Reroute in Appendix B of the FEIS. Also, please see Response 17-4 regarding preparation of a supplemental DEIS.

17-17
Please see Response 17-14 regarding vegetation impacts.

Field surveys were conducted in August 2001 along the Preferred Alternative to identify late-blooming rare species and to search for potential habitat for other rare species habitat to be surveyed in 2002. A second year of field surveys was conducted throughout spring to late summer in 2002. A professional botanist skilled at identifying plants in the Columbia Basin was retained to conduct rare plant surveys during the correct time of year to identify the species with the potential to occur in the area. The surveys were done at a level of intensity to ensure that if rare species are present, it is likely that they would be found. The results of rare plant surveys are included in Appendix F, Rare Plant Survey for the Preferred Alternative of the FEIS.

As explained in Responses 17-5 and 14-1, Cooke Coleman LLC has refused BPA entry to their property; therefore, a detailed survey of the Segment A Reroute on their land could not be conducted.

Also, please see Response 17-4 regarding preparation of a supplemental DEIS.

17-18
Cooke Creek is the correct name. All occurrences of "Cooke Canyon Creek" in the EIS and Appendices have been corrected to read "Cooke Creek."

17-19
Please see Response 17-5. At the time that the analysis for the Segment A Reroute was completed, BPA made the decision not to revise the Fish and Wildlife Technical Report in the DEIS Appendix to include the new information, but to include it only in Chapters 2, 3, and 4 of the FEIS. Similarly, BPA has not revised the Fish and Wildlife Technical Report for the FEIS Appendix but has added information in Appendix B on the Segment A Reroute.

Also, please see Response 17-4 regarding preparation of a supplemental DEIS and Response 17-14 for a response to comments regarding impacts on wildlife species.

The definition of riparian vegetation in the DEIS glossary is inadequate. According to the USDA Natural Resources Conservation Service (1996), "Riparian areas are lands that occur along watercourses and water bodies. Typical examples include floodplains and streambanks. They are distinctly different from surrounding lands because of unique soil and vegetation characteristics that are strongly influenced by the presence of water." The American Fisheries Society (1998) defines riparian vegetation as "Vegetation growing on or near the banks of a stream or other water body that is more dependant on water than vegetation that is found further upslope." It is generally accepted that riparian vegetation is significantly different from surrounding upland vegetation, which in the area where the Segment A Reroute crosses Cooke Creek is shrub-steppe composed mostly of sagebrush. Shrub-steppe vegetation near Cooke Creek is indistinguishable from upland areas and cannot be considered riparian vegetation. The riparian areas along Cooke Creek and most other streams along Segment A exist as thin strips of cottonwoods, willows, and shrubs following individual stream channels.

As described in Response 17-4, the amount of riparian vegetation (taller cottonwoods and willows) removed along the Segment A Reroute would be less than or, at most, approximately equal to the amount removed from the original Segment A alignment.

17-20
Please see Response 17-5. The Segment A Reroute has been added to all maps in the FEIS. At the time that the analysis for the Segment A Reroute was completed, BPA made the decision not to revise the Fish and Wildlife Technical Report in the DEIS Appendix to include the new information, but to include it only in Chapters 2, 3, and 4 in the DEIS. Similarly, BPA also has not revised the Fish and Wildlife Report for the FEIS Appendix but has added information in Appendix B on the Segment A Reroute.

Also, please see Response 17-4 regarding preparation of a supplemental DEIS.

Please see Response 17-19 for a definition and discussion of riparian vegetation. Impacts to fish species in Cooke Creek from removal of riparian vegetation would be the same or lower for the Segment A Reroute as for the original Segment A alignment. Tower sites would be located well back from any channels of Cooke Creek and access roads would not cross the creek, which is similar to the original Segment A alignment. The topography of the area slopes parallel to Cooke Creek, so any sediments or pollution resulting from construction in upland areas would not flow directly into the creek. Best management practices proposed for construction near streams would prevent sediments and pollutants from leaving construction sites. Overall, impacts to fish species present in Cooke Creek would be the same for both the original alignment and the Segment A Reroute.

17-21
Please see Response 17-5. The Segment A Reroute has been added to all maps in the FEIS.

At the time the DEIS was published, BPA did not have detailed information on access roads. The access road study has been completed for the FEIS. No access roads have been proposed to be built for the Segment A Reroute.

BPA commends Mr. Kellogg for taking steps toward restoring portions of the Kellogg Family Ranch to a natural state as it existed prior to widespread cattle grazing.

BPA disagrees with Mr. Harrel's conclusions regarding the impact discussions in the DEIS. Additional analysis of impacts on floodplains and wetlands along the Segment A Reroute has been added to Appendix B of the FEIS.

17-22
Additional discussion and analysis of impacts on land use along the Segment A Reroute have been added to Appendix B of the FEIS.

17-23
Please see Response 7-3.

17-24
Please see Responses 17-1, 17-2, 17-4, and 17-5.

The electric fields, magnetic fields, and corona effects (audible noise, radio interference, television interference, and visible light) levels from the proposed 500-kV line and the relocated Vantage-Schultz 500-kV line in the proposed Segment A Reroute would be comparable with those along other sections of the route. The presence of two transmission lines on a 350-foot ROW would increase the ROW area over which fields and corona-related quantities are present. However, the levels on the ROW would not exceed, and the levels at the edge of the ROW and beyond would not be different, from those described in the DEIS for the remainder of the route. Therefore, the impacts associated with electromagnetic field (EMF) and corona effects would be similar to those described in the DEIS and the basic conclusions of Appendix I, Electrical Effects remain unchanged for the Segment A Reroute section.

A second addendum to Appendix I, Electrical Effects is being prepared to quantify field and corona effects levels along the sections in Segment A where the proposed line would be located 200 feet from the existing Vantage–Schultz 500-kV line. This includes the Segment A Reroute section.

Noise from vehicles, aircraft and other equipment, air quality issues, and management of toxic and hazardous substances would be the same for the Segment A Reroute section as for other sections of the proposed line during construction, operation, and maintenance; therefore the discussion of these impacts presented in the DEIS applies to the Segment A Reroute section as well as the rest of the route.

It is not expected that concrete would be used for footings of support structures along the Segment A Reroute. The support structures would likely be attached to steel plates or grillages that are placed within the excavated area. It is not anticipated that the addition of a transmission line and relocation of the existing line would alter the elevation of the groundwater along the Segment A Reroute. Excavations for the support structures for these two transmission lines would have a low, localized, temporary impact to groundwater if it is less than 6 to 10 feet deep. The impact would be even less if the groundwater were deeper.

17-25
The Segment A Reroute has been added to all maps in the FEIS.

Additional discussion and analysis of impacts on visual and recreational resources along the Segment A Reroute have been added to Appendix B of the FEIS.

Also, please see Response 17-4 regarding preparation of a supplemental DEIS.

The DEIS recognized the visual importance of the area around the Segment A Reroute, as demonstrated by the location of "Visually Sensitive Viewpoint A," indicated on Map 10 and discussed in section 3.9.1.1. Visual impacts of the Segment A Reroute would indeed be higher at viewpoint locations closer to the reroute (particularly locations within 0.5 mile) and, as demonstrated by the comment, all viewers from the Kellogg Ranch are apparently extremely sensitive, which supports the definition of "High Visual Sensitivity" provided by the EIS in the sidebar of section 3.9.1. Impacts would be high to moderate for residential properties within 0.5 mile of the Segment A Reroute.

Colockum Pass was identified as a Visually Sensitive Area due to the number of residences with foreground views of the proposed transmission line project(s). The photograph for "Visually Sensitive Viewpoint A" is taken from Gage Road. Cooke Canyon Road and Coleman Road are in this general area as well, but contain fewer residences within 0.5 mile.

No public recreation resources were identified, and no private recreation activities conducted on privately owned lands (such as camping, broom hockey, and all-terrain vehicle usage) were known during the preparation of the DEIS. Thus, no discussion of recreational activities in this area was presented. These identified private activities have been addressed in Appendix B of the FEIS. However, placement of two proposed transmission lines along the Segment A Reroute alignment would not prevent the identified activities from occurring elsewhere on the private property, including within the transmission line ROW and around the transmission line towers. Appendix B of the FEIS has been written to clarify the impacts to recreational activities from Segment A Reroute.

17-26
Please see Responses 17-4, 17-5, and 17-15.

18-1
Please see Response 10-6.

18-2
It is unfortunate that you did not find our public meetings helpful. BPA tries to provide a welcoming environment for the public in order to answer their questions and to record their comments. Often times in this kind of setting a number of people will stand together at a station/table giving comments as a group, or as you said, participating in a public dialogue. BPA is not required to hold a public hearing where members of the public stand before the group and give testimony. BPA has found that the open house meeting style is very successful in generating dialogue between agency representatives and the public.

18-3
Comment noted. BPA has met or exceeded all public involvement requirements per the CEQ regulations and DOE Guidelines Implementing NEPA.

18-4
BPA agrees with your assessment. That is one reason BPA has chosen Alternative 2 as the Preferred Alternative (Segments A, B_{SOUTH}, and D).

Along Segment A, the new line would parallel BPA's existing 500-kV Schultz-Vantage line at a distance of up to 1400 ft. The reasoning behind this required separation is explained in Response 10-3. More information is also contained in Appendix D, Line Separation Issue Paper.

For most of its length, Segment B_{SOUTH} would parallel an existing lower voltage 230-kV line at a separation of 125 feet. Segment B_{SOUTH} was preferred by the Army.

Segment D parallels existing BPA 230-kV lines at a separation of 125 feet from the existing lines. Along an 8-mile double-circuit section, between structures 11/1 to 2/1 of the existing Midway-Vantage 230-kV line, the existing ROW would be expanded 25 feet on the west side to accommodate the new large double-circuit structures.

18-5
Please see Responses 10-3, the last paragraph of 10-4, and 10-5.

As stated in Response 10-3, replacing the existing single-circuit towers with double-circuit towers would not reduce the amount of construction disturbance. It is true that there would be only one set of towers, but if the issue is disturbance to a fragile ecosystem, the damage has already been done by the existing towers. In some cases, enough time has passed that some of the vegetation has recovered around the towers, to take the tower out now would disturb the area again. BPA would locate the new double-circuit towers near the existing towers and then remove the existing towers so the footprint of two towers would cause disturbance for every one double-circuit tower. In using the double-circuit towers, the cost would be almost double that of the single-circuit towers and would increase the amount of construction disturbance. In addition, double-circuit structures would be about 40 feet taller than single-circuit structures. Depending on the area, this could increase visual impacts and/or avian collision. The double-circuit structures would hold six bundles of conductor on three levels (see illustration of structure in Chapter 2).

As the new line crosses the Columbia River, north of Midway Substation, it would be located to the west of the existing lines that cross the river. The existing lines are both BPA and Grant County 230-kV lines. Although BPA could double-circuit with another BPA 230-kV line (as explained in Response 10-3), the new line cannot be double-circuited at this point because it is not being routed into Midway Substation as is the existing line, but rather around and to the west of the substation. Avoiding Midway Substation requires the westernmost alignment of the new line as it crosses the Columbia River. In addition, BPA cannot locate the new line over Midway Substation because of reliability and safety issues. South of Midway Substation, the new 500-kV line would parallel BPA's existing Big Eddy-Midway 230-kV line at a 125-foot separation. Through the Hanford Monument, BPA is planning to construct the new line using flat configuration structures to reduce impacts on birds.

19-1
In Section 1.1 of the DEIS it is stated that "…During spring and early summer months, the amount of power that needs to move through this area exceeds the carrying capacity of the existing transmission lines…." In order to accommodate additional power transfers through this area, more transmission capacity must be made available so that system reliability will not be compromised in the event of an outage. The term "maintain system reliability" was meant to describe the ongoing efforts to reinforce the transmission system for today's needs and future uses, and to meet higher reliability standards supported by the electric industry reliability council (North American Electric Reliability Council, NERC).

19-2
BPA agrees that the primary purpose of an EIS, as stated at 40 CFR 1502.1, is to serve as an action-forcing device to inform the decision-maker, and that NEPA does not allow an agency to define its purpose and need so narrowly as to unreasonably restrict the array of alternatives. However, BPA, as a federal agency, has the discretion and expertise to define the purpose and need for the action that

it is proposing to take. BPA has defined the need for action for this project in Section 1.1 in the DEIS and FEIS in relatively broad terms. Moreover, in this instance, BPA must look at constraints and limitations of its existing transmission grid that impede BPA's mission to provide reliable and cost effective energy to its customers. Naturally, the location and nature of identified constraints and limitations have an effect on the types and locations of actions BPA may need to consider to remedy such constraints and limitations. Please note, BPA has added a section in the FEIS under Section 2.7, *Alternatives Eliminated from Detailed Consideration*, that describes BPA's study of non-transmission line alternatives, including those you have identified in this comment letter. This section in the FEIS explains that non-transmission alternatives were not reasonable alternatives to meet the need as described in Chapter 1.

19-3
BPA respectfully disagrees that the actual need and purpose of this project is to increase system reliability. Although maintaining transmission system reliability is certainly an important purpose, there are several other purposes stated in Section 1.2 of the DEIS. Notably, optimization of transmission system usage is also identified, which includes the ability to carry greater electrical loads to meet rising electrical demand and the ability to transmit electricity from one area to another. Certain areas are, in fact, in greater need of system fixes than others. BPA believes it has identified neutral, yet important project purposes, and that BPA is looking at the reasonable array of alternatives that meet the identified project need. In addition, please see Response 19-2.

19-4
Please see Responses 19-2 and 19-3.

19-5
The need for action is insufficient transmission capacity to accommodate additional power transfers through the north of Hanford area. By increasing the transmission capacity north of Hanford additional power transfers can be accommodated while maintaining system reliability. Distributed renewable generation is now only becoming a viable alternative to central plant generation, but cannot, in the next 5 or 10 years, make enough of an impact on energy use to delay the need for this project. BPA has been a major player in regional conservation for the past 30 years, which has reduced the energy needs of the Pacific Northwest substantially. However, the potential for reduced energy use from conservation and the benefits of distributed generation combined cannot eliminate the need for this project. Since the DEIS was written BPA was involved in the construction of several large wind generation project in central Washington, there are still a few more possible in the near future and this will continue to strain the transmission system in that area. Major transmission reinforcement is and will be required to benefit from earth-friendly generation sources.

Please see Responses 19-1, 19-2, 19-3, and 19-4.

19-6

Please see Response 19-5.

19-7
Some of the lost generation due to spilling water for salmon transportation could be made up through distributed renewable energy near the lower Snake and Columbia Rivers. However, during the spring and summer months, electricity generated in Canada and at dams along the mid- and

upper-Columbia River moves south through central Washington to load centers in Seattle and Portland, and through the Southern Intertie to meet market demands.

19-8
Please see Responses 19-5 and 19-7.

19-9
Please see Responses 19-5 and 19-7.

19-10
Please see Responses 19-2 and 19-3. BPA has been undertaking studies and investing in on-the-ground conservation and encouraging renewable generation for many years, including a recent infusion of money into, among other things, wind generation. We agree that conservation and renewable energy generation remain an important part of our overall mission. However, it should be noted that our energy forecast already has taken foreseeable conservation and renewable generation into consideration.

19-11
Please see Responses 19-1 to 19-10.

19-12
Part of BPA's responsibilities in the region include helping meet the region's energy needs. As presented in your comment, every project that BPA proposes or is partner to in the past, present, and foreseeable future that helps meet the region's energy needs would qualify as cumulative impacts under NEPA, and should be described in the EIS. Past projects are already completed and, since the inception of NEPA, environmental coverage on these projects has been completed. Most future projects are too speculative at this time to require compliance with NEPA, but as they are proposed, each project will require NEPA coverage. The projects you have identified have independent and distinct purposes and needs, and the decision to implement one project is not dependent on the implementation of the others. They each address certain regional needs and have independent utility. Moreover, trying to include all of these projects in one EIS would make that NEPA process unwieldy, which would tend to obscure the many potentially significant impacts of the many projects, and likely discourage, rather than encourage, meaningful public review. Dealing with so many projects and alternatives within a single document would also tend to complicate the nature of the decision at issue, and potentially hinder, rather than clarify, decisions for the decision-maker. At that scale, detailed impacts could not be revealed effectively because data presentation would need to be at such a large scale.

BPA has a responsibility to provide NEPA coverage on actions that it proposes. The agency uses its discretion and the DOE rules on implementing NEPA to determine the scale of the proposed federal action, and the manner and level of NEPA coverage for each proposed project. BPA believes the proposed Schultz-Hanford Area Transmission Line Project is being presented to the public and the decision-maker at the appropriate level and scale for meaningful review.

19-13
BPA follows the Transmission System Vegetation Management Program DOE/EIS-0285 for managing vegetation on rights-of-way and at facilities. This program identifies buffer widths that vary based on herbicide toxicities (defined for each herbicide by concentration), characteristics, and the type of

application used near water bodies, agricultural irrigation, domestic/public drinking water wells, water intakes/spring developments, and sole source aquifers. For example, the use of a moderately toxic herbicide near a water body would require a 25-foot buffer between the water's edge and the edge of the application area if using spot application. If, for example, aerial application would need to be used for the same herbicide, a 250-foot buffer would be required between the water body and the edge of the application.

It is anticipated that there would be low to no impact on water quality from the use of herbicides to control vegetation near water bodies. BPA would follow the Transmission System Vegetation Management Program, which is included in the FEIS as mitigation for impacts to vegetation.

19-14
The "distributed renewable energy generation" is not an alternative that is being considered in this EIS. It does not meet the purpose and need for the project. Please see Responses 19-5 and 19-7.

19-15
For a discussion of public health and safety impacts from the two gas-fired plants identified in Chapter 1, please see the EISs for those projects. The Starbuck Power Project is presently on hold and a DEIS will not be released to the public at this time. The FEIS for the Wallula Power Project was released to the public in August 2002. BPA is currently awaiting approval from the governor of Washington before BPA writing a Record of Decision. Construction of future gas plants as a result of this transmission line project is highly speculative and beyond the scope of this EIS.

19-16
Under the USA PATRIOT Act (Pub. L. No. 107-56, § 1016) "A continuous national effort is required to ensure the reliable provision of cyber and physical infrastructure services critical to maintaining the national defense, continuity of government, economic prosperity, and quality of life in the United States." "Critical infrastructure" is defined by the act as "systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security, national economic security, national public health or safety, or any combination of those matters." The White House publication "The National Strategy for Homeland Security" includes the energy sector as a component of critical infrastructure (see page 30).

In support of national efforts to prevent domestic terrorism, BPA limits the distribution of maps (particularly in electronic format) that detail facilities critical to sustaining the reliability of its transmission system and the energy infrastructure of the Pacific Northwest, while adhering to public information laws and guidance from the Department of Energy, the Office for Homeland Security, Congress, and the President.

Consistent with BPA's Open Access Transmission Tariff, BPA does not take a position on the choice of energy resources used by others in the Pacific Northwest where BPA's involvement is limited to the request for interconnection.

19-17
See Response 19-15. This response also applies to air quality and all other environmental resources.

20-1
After receiving your comment we have attempted to obtain a copy of the Nature Conservancy's report that you sited but have been unable to do so. Other reports authored by the Nature Conservancy were used in this EIS and can be found in the References Chapter.

20-2
Please see Responses 10-3 and 18-5.

20-3
Please see Responses 10-3 and 18-5.

20-4
Please see Responses 10-3, 10-5, and 18-5.

20-5
Please see Response 19-12. Each of the projects listed in Section 1.6 of the DEIS and FEIS is undergoing their own NEPA analysis. If BPA were to analyze all of the actions it is presently undertaking in one EIS, the scale of the analysis would be much too large, too general, and would likely obscure the type, abundance, and level of impacts that may occur. BPA believes that analyzing all of these projects, purposes, and alternatives in a single document would be counter-productive, and would not truly reveal the more detailed impacts that would be present. Furthermore, proposed mitigation at this scale would be extremely complex and would be more effectively dealt with on a project-by-project basis. However, BPA understands your concerns regarding cumulative impacts, and has tried to acknowledge and address cumulative impacts to each resource in Chapter 4.

20-6
Please see Response 10-5.

20-7
Mitigation measures described in the EIS will be written into the specifications of the construction contract. The contractor will be responsible for abiding by the conditions of the contract. A separate professional environmental and erosion control contractor will be used to provide construction monitoring which would include preparing erosion control plans and BMP's for all sensitive areas and disturbances, then constructing, monitoring and maintaining these BMP's. The same company would monitor construction crews during construction and conduct final stabilization and monitoring of stabilized areas after construction. The BMP's would include measures for limiting the amount of disturbance to shrub-steppe and preventing the spread of noxious weeds. Long term monitoring of revegetation success and long term weed control would be accomplished by BPA maintenance. BPA may also work with landowner agencies and other state or federal agencies to monitor sensitive habitat status.

20-8
A Mitigation Action Plan will be developed as part of the construction specifications. Sensitive areas requiring avoidance as well as revegetation directions, including seed mixes, will be included. BPA has contacted local seed suppliers in order to have adequate supplies of native seed mixes available after construction.

21-1
The Segment A Reroute goes around a tribal allotment. The question of if this property has been used for any recent cultural activities would need to be referred to the allottee(s). It would be expected that cultural activities would have been conducted by the allottee's family members or at least conducted with the knowledge of the allottee(s). The implication that only recent cultural use of the property would warrant avoidance by the proposed project is not consistent with applicable cultural resources laws and regulations. Cultural uses represented by physical (archaeological) remnants must be assessed for significance/importance to all interested parties and the general public based on criteria established by federal law (the National Historic Preservation Act). Conversely, the importance of a property solely for its traditional cultural uses (e.g., as a Traditional Cultural Property), whether conducted in recent memory or in the more distant past in some cases, can only be determined by the interested parties, such as Native Americans, who conducted those activities. Under federal guidelines, judgment of the importance of preserving a property where traditional uses occurred is not open to assessment by parties not associated with the traditional activities.

Regarding the question of whether any Native American traditional cultural practices have ever been documented for the tribal allotment, field-based studies were not conducted prior to release of the DEIS. Consequently, discoveries of archaeological materials that would demonstrate some aboriginal cultural uses of the property had yet to be documented when the DEIS was written. In addition, Traditional Cultural Property studies, which may indicate traditional cultural uses of the property that may or may not leave physical remains, also had not been completed. Documentation of evidence of aboriginal use of this and other properties along the Preferred Alternative has since been conducted and is summarized in the FEIS.

21-2
BPA has completed its negotiations with the allottees through the Bureau of Indian Affairs. BPA has successfully obtained rights across the tribal allotment for the new line and the existing line. If BPA decides to construct the Preferred Alternative, the new line would cross the tribal allotment land and would not follow the Segment A Reroute.

21-3
Please see Response 21-2.

21-4
Please see Response 17-5.

21-5
The EIS preparers are those people who have been directly involved in the writing of the EIS or planning of the project. They are BPA employees, consultants, and subconsultants. State and other federal agencies have been consulted in the development of the EIS and have contributed information to the analysis for the EIS, but they are not listed as preparers. BLM, U.S. Army, USFWS, and BOR are all cooperating agencies for this document and have participated in various meetings, submitted information, and actively reviewed the document prior to publishing. The Confederated Tribes of the Colville Reservation and the Yakama Nation were hired to complete the cultural resource work.

21-6
Please see Response 21-5.

Approximately 0.8 mile of the Segment A Reroute has soils that, if irrigated, would be designated as prime farmland.

Please see Response 17-14 for a discussion of impacts to wildlife. Additional discussion and analysis of impacts on wildlife along the Segment A Reroute have been added to Appendix B of the FEIS.

21-7
Comment noted. Please see Response 21-2.

22-1
We have noted the corrections to your previous submittal.

23-1
BPA has always considered double-circuit only in the agricultural areas. Also please see Response 10-3. BPA agrees that this is the most rugged portion of the entire route. The existing access roads in this area, and in other parts of the project, are being upgraded to accommodate construction traffic. The roads would be bladed and rocked. BPA would extend the existing roads to the new tower sites. BPA has located the new line such that tower site locations can be more flexible to minimize impacts by new tower sites and the new access road extensions.

23-2
On-the-ground surveys were completed before issuing a FEIS. All reports have been made available to the BLM. Cultural resources, rare plants, and sensitive wildlife species information has been updated in the FEIS.

23-3
The Confederated Tribes of the Colville Reservation (CCT) and the Yakama Nation have both expressed interest in this project. The CCT completed Phase 1 (literature review) of the cultural resource work for BPA. This was included in the DEIS as Appendix H. The Yakama Nation and its consultants are completing Phase 2 (cultural resource survey). In an effort to protect known cultural resources, the complete Phase 1 and Phase 2 studies are not included as an appendix to the FEIS; however, results of the surveys are summarized in Chapters 3 and 4 of the FEIS. BPA has also requested that the CCT submit a Traditional Cultural Properties study to BPA. BPA has initiated formal consultation under the NHPA with both Tribes. The CCT and BPA had their first consultation meeting on July 2, 2002. BPA will send all final survey reports to the BLM.

23-4
All occurrences of the term “BLM sensitive species” in the EIS and Appendices have been changed to “BLM special status species.”

23-5
It was BPA’s understanding that the parcels within the YTC that were previously held by the BLM had been or were being released to the YTC. Because the parcels are located within the boundaries of the YTC, they are being managed as part of the YTC. BPA proposes to keep the discussion of land ownership as was stated in the DEIS.

23-6
Section 5.5.1.1 will be corrected to accurately state that the BLM Spokane District is divided into ten management areas. Table 5.5-1 will also be corrected to state that Segment B crosses “Saddle Mountains,” Segment C crosses “Scattered Tracts,” and Segment D crosses “Saddle Mountains and Scattered Tracts.”

23-7
The scale of the maps in the FEIS will not change. Because the project area and total amount of proposed transmission line is so large, the maps need to be at the present scale to keep the number of maps in the FEIS manageable. BPA realizes that the scale, unfortunately, does not allow for detailed study, only illustration.

Specialized maps and photos are being prepared for construction to show tower and road locations, in greater detail, as well as sensitive areas to avoid. Unfortunately, due to security reasons, BPA is unable to publish these maps as part of the FEIS or appendices.

23-8
BPA met with the BLM on May 20, 2002. BPA was able to discuss, in more detail, the proposed tower and access road locations that may affect BLM-managed land. Realty requirements were discussed. Right-of-way application and plan of development requirements were also discussed.

BPA fish and wildlife and botany contractors met with a BLM staff (wildlife biologist) on June 12,2002 on Saddle Mountain to review the tower and access road locations and discuss potential impacts. The BLM biologist stated that the project would likely cause relatively low impacts to habitat, wildlife and plants along the proposed route through BLM lands.

A conference call meeting was held on November 7, 2002, to further discuss new design developments. A field trip was conducted on November 21, 2002, to view tower locations, access roads, and sensitive sites. BPA will continue to be available to meet and discuss project design and impacts on the ground or in the office with BLM staff.

24-1
BPA has located your previous letter. The engineering design staff will contact you if necessary.

25-1
BPA has noted the corrections to your previous submittal.

26-1
The maps in the FEIS have been corrected. On the 11x17 maps, the “Hanford Site” refers to the Hanford Reach National Monument and the DOE lands as a whole. Map 8 delineates the boundaries of the Hanford Reach National Monument and the DOE portion of the Hanford Site. It also shows the areas managed by the USFWS. More information on cultural resources and consultation with Tribes has been incorporated into the FEIS, including the Summary.

26-2
Please see Responses 10-3, the last paragraph of 10-4, 10-5, and 18-5.

26-3
A discussion of the significance of impacts to wildlife species can be found in Section 4.4.1 Impact Levels. This section describes five categories of impact levels developed to describe potential impacts the project might have on individual species. A more detailed analysis of how construction might impact various species has been included in Section 4.4.2. Because construction and operation of a project in a particular habitat generally affects a number of species dependent on that habitat, impacts to wildlife species have been addressed by groups according to their preferred habitat.

26-4
A Biological Assessment (BA) was prepared to evaluate the potential effects of the project on listed and proposed listed species and critical habitat. USFWS has concurred with the effect determinations in that document. There were no effects to listed fish species, therefore, NMFS did not renew the BA.

26-5
Additional cultural resource surveys were conducted along the Preferred Alternative, with the exception of four small areas where access was denied to archaeologists by the private landowners. All areas that have denied BPA access would be surveyed after BPA purchases the easements for the new line. More information on cultural resources and consultation with Tribes was incorporated into the FEIS, including the Summary. Cultural resources that are considered to be significant or potentially significant and eligible for listing on the NRHP are identified in the survey reports. Specific details about individual cultural resources are not described in order to protect the location and quality of each resource. Avoidance and mitigation measures are also included.

The proposed Black Rock Reservoir is not in the vicinity of this project.

26-6
As part of the Preferred Alternative, fiber optic cable would be strung on the new transmission line between the Vantage and Wautoma Substations as well as on existing transmission lines between Midway and Wautoma Substations and Vantage and Columbia Substations. More detailed information on the fiber construction has been added to Chapter 2 and Appendix C, Construction Procedures. Impacts resulting from the fiber installation have been more clearly called out in Chapter 4 of the FEIS.

26-7
The USFWS has not designated critical habitat for bull trout. All references to critical habitat for bull trout have been removed.

26-8
BPA follows national standards and BPA standards to ensure the safety of the facility and people who work on the facility, live near the line, or use the ROW. The new line's conductors cannot be as low as the existing lower voltage lines such as the 230-kV line. BPA, in some cases, will use a flat configuration tower where all the conductors are on the same level except for the overhead groundwire. The actual tower height is dependent on the voltage of the facility, the land use within the ROW, and the distance between towers. For example, if lower towers are used, then the distance between towers must be shortened. And, if there is shorter distance between each tower then more towers are needed along the route. BPA tries to balance the distance between the lines, the height of the towers, the costs of the facility as the distance between towers is reduced or

increased from optimum (1,150 feet), and the land use (agriculture, residential, recreation area, natural environment issues, cultural issues, etc.).

26-9
Please see Response 19-1.

The need for action is insufficient transmission capacity north of Hanford to accommodate additional power transfers during the spring and summer months. If additional transmission capacity is not made available then system reliability could be compromised in the event of an outage.

The transmission system is operated in a reliable manner to meet expected outages. In order to facilitate additional power transfers required by market demands, more transmission capacity needs to be added to the transmission system.

Construction of the Preferred Alternative does not require the construction of another 500-kV facility along a different route in the event of an outage.

26-10
The only criteria BPA will use are whether or not BPA, through the Bureau of Indian Affairs (BIA), is successful in its negotiations with the tribal allottee(s). Please see Response 21-2.

26-11
Please see Responses 7-2 and 10-3.

26-12
The introduction or spread of weeds has been changed to a high impact level.

26-13
Alternative 2, the Preferred Alternative, is listed first in tables for ease of referencing impacts of the Preferred Alternative. The other alternatives are not listed in any order of preference. The mention of Segment G was an oversight in editing. B_{SOUTH} was originally referred to as Segment G by the project team.

26-14
The numbers in the FEIS have been updated and where appropriate the use of acres has been incorporated.

26-15
The Washington Natural Heritage Program (WNHP) determines if communities meet the definition of High Quality Plant Communities. The two plant communities identified by the WNHP as occurring within the study area include the Wyoming big sagebrush/bluebunch wheatgrass shrubland community and the bitterbrush/Indian ricegrass shrubland community. This sagebrush/wheatgrass community represents an area of shrub-steppe that has been relatively undisturbed. Approximately 50% of the historical shrub-steppe area in Washington has been converted to agricultural uses and only about 25% of the remaining shrub-steppe is in reasonably good condition; therefore, this area represents a relatively rare resource.

The WNHP was contacted to determine if it is possible to answer this comment, and they responded that the state has not been completely inventoried for High Quality Plant Communities. It would take a huge effort in terms of personnel and funding to conduct a complete inventory given the geographic extent of the Columbia Basin and it would also be difficult to obtain permission to enter all areas. WNHP staff stated that they know of other examples of these communities not included in their inventory. Therefore, BPA cannot determine the proportion of the total acreage of these communities that will be impacted or the relative quality of these occurrences to other occurrences. Only the amount of the High Quality Plant Community that will be impacted by this project can be calculated. This information was included in the FEIS. As requested by the USFWS, a Spring 2003 survey will be conducted on the monument.

26-16
The first round of rare plant surveys were conducted in the late summer of 2001, which was too late to identify some rare plants. Surveys in April, May, and August of 2002 were conducted based on the phenology of expected rare and listed plants. Results and analysis of the survey data have been added to the FEIS and Appendix F, Rare Plant Survey for the Preferred Alternative.

26-17
This section and its reference to Johnson and O'Neill has been revised to reflect the fact that more than the 150 species listed in Johnson and O'Neill use or occupy shrub-steppe habitat during some aspect of their life cycle.

26-18
All references in the FEIS to "Canadian geese" have been revised to read "Canada geese."

26-19
The reference to the elk herd "dramatically increasing" has been removed. Also, the reference to elk populations in surrounding areas coming from the Rattlesnake herd has been removed.

26-20
The Brunkal quote has been changed to state that potential habitat for pygmy rabbits and sagebrush voles is known to exist in Hanford Reach National Monument, but extensive surveys have not been completed for these species.

26-21
A discussion of the pygmy rabbit has been included in Section 3.5.7, *Threatened and Endangered Species*.

26-22
The extra listing of sagebrush vole in Table 3.5-1 has been removed and the correct information is presented in the listing.

26-23
Table 3.7-2 "*Private and Publicly Administered Lands in the Project Area*" was created to show land ownership, not who administers the land. The title of the table has been changed to "*Private and Publicly Owned Lands in the Project Area*."

26-24
The Land Use and Recreation sections in the FEIS were modified to include these accurate public agency administered lands as well as the National Wild and Scenic River classification and interim protection of the Columbia River.

26-25
The description of the Hanford Reach National Monument in this section was corrected in the FEIS.

26-26
The word "uninhabited" was deleted from this section in the FEIS.

26-27
The reference to the Wahluke Unit in this section was corrected in the FEIS.

26-28
BPA agrees that the Highway 24 travel corridor and Vernita Bridge and primitive boat launch are important visual locations for the local area. A "Visually Sensitive Viewpoint" has been added to the FEIS for the boat launch area. As discussed in the FEIS, the presence of seven existing transmission lines crossing the Columbia River 2 to 3 miles from this viewpoint contribute to a low to moderate impact resulting from the addition of a new transmission line. Additional visual impacts and mitigation measures are discussed in Chapter 4 of the FEIS.

26-29
The descriptions of recreation activities that occur on the Saddle Mountain Unit and the Wahluke Unit have been updated in the FEIS.

26-30
Table 4.1-1 has been updated to include the number of acres that would be disturbed by the line tensioning/stringing sites, staging areas, and construction of the Wautoma substation.

26-31
BPA agrees that fragmentation of vegetation communities reduces biodiversity. The effects of fragmentation have been discussed in the FEIS, mainly in terms of the effect to wildlife, although the potential effects to plants, such as impeding dispersal across the landscape and other aspects of plant life history, also have been discussed.

26-32
The following moderate impact level has been added to address this situation: In areas where native species are a minor component, removing the natives from the plant community is a moderate impact.

26-33
The impact level of increasing the density of noxious weeds in a location where they already exist has been increased to a moderate impact from a low impact.

26-34
A botanist has visited the area to verify the impacts that the proposed line would have on this community. No access roads or structures would be placed in this vegetation community, therefore

the project would have no effect on the Wyoming big sagebrush/bluebunch wheatgrass plant community.

26-35
A survey for Ute ladies'-tresses was conducted in September 2001 and August 2002 when the species can be identified by floral characteristics. BPA contracted with an independent botanist, who currently performs monitoring of a Ute ladies'-tresses population in Washington State and who also discovered a population of this species. The botanist searched for potential habitat and conducted the survey in potential habitat, including stream crossings. The botanist did not locate any Ute ladies'-tresses. Most road crossing areas are not potential habitat for this species because it requires high groundwater levels in the summer and most road crossings are over narrow streams that are often quite dry and have a narrow riparian area and narrow stream channel.

26-36
Please see Response 26-15 for a discussion of WNHP high quality plant communities.

A survey was done of the Umtanum buckwheat population in September 2001 and in spring and summer of 2002 by a botanist who was involved in the discovery of this occurrence and who continues to participate in the monitoring of this species. An existing transmission line is located between the proposed route and the Umtanum buckwheat population. Double-circuiting the line in this area is not considered necessary to protect the Umtanum buckwheat from impacts from the construction and presence of the proposed transmission line because an adequate buffer would be in place.

Existing access roads will be used that will not affect the Umtanum buckwheat population. One access road is particularly close to a population. BPA has agreed to install fencing along the road to keep vehicular traffic and parking from disturbing this population. Also, BPA has agreed to install a gate on the road entering the area to minimize general public use of the area.

Please see Responses 10-3 and 18-5 regarding double-circuiting.

26-37
Please see Response 26-35.

26-38
BPA is coordinating with the USFWS (Hanford Reach National Monument/Saddle Mountain Unit) staff to determine when, where, and how mitigation for impacts to native plant communities and shrub-steppe communities can be accomplished. Please see Response 10-5.

26-39
Please see Response 10-4 regarding reseeding activities.

26-40
Please see Responses 10-3 and 18-5. Also, BPA has surveyed for rare plants and found none near or within the proposed ROW.

26-41
The BPA is committed to working with the USFWS on all aspects of the project that concern the Hanford Reach National Monument/Saddle Mountain Unit as well as other lands that are managed by the USFWS. Design data for access roads and tower locations and survey results for sensitive plants and animals and cultural resources are being shared and discussed with the USFWS. Also, please see Response 26-38.

26-42
A discussion of potential electrocution of perching and migratory birds and prevention measures has been included in Chapter 4 of the FEIS. These risks have been significantly minimized by design changes over the past several decades. All BPA transmission line systems have been specifically designed to prevent electrocution of perching and migratory birds, including raptors. The size of 500-kV lines and the distances between conductors and between conductors and towers is much larger than the wingspan of the largest bird species. These tower and conductor system designs will also be used for this project.

26-43
BPA is not planning to conduct post-construction surveys for bird collisions with the new transmission line.

26-44
A discussion of the pygmy rabbit has been included in Section 4.4.8, *Threatened and Endangered Species*, of the FEIS.

26-45
All discussion in the FEIS of impacts on bald eagles has been changed from none to low, due to the potential for disturbance by temporary displacement from construction or maintenance activities.

26-46
The area between the Columbia River crossing at Midway and the proposed Wautoma Substation will have spiral bird markers installed on overhead groundwires on each span to prevent sage grouse and other birds from colliding with the transmission lines and overhead groundwires. Existing access roads will be used to the extent possible and new towers will be located adjacent to existing towers in most locations to match spans. BPA will use flat configuration structures (see Chapter 2 for an illustration) to lower structure height and keep all conductors on the same level through particularly sensitive areas. This will minimize the amount of shrub-steppe disturbance and minimize the vertical offset between the new transmission line and the existing lines.

26-47
Construction on much of the Hanford Reach National Monument/USFWS- and DOE-managed lands is planned for winter to avoid the risk of fire and to maximize revegetation success.

26-48
A number of studies of bat mortality and injury have been done in association with wind turbines and communications towers, however no studies of bat mortality and injury associated with transmission lines have been done (See Keeley in Avian Interactions With Utility and Communications Structures, Proceedings of a workshop held in Charleston, South Carolina, December 2-3, 1999. EPRI). There is some evidence that migrating bats echolocate less than foraging

bats, and may be more susceptible to collisions with tall structures especially communication towers and other very tall structures. However, migrating bats probably fly higher than the typical transmission line structures. It should be assumed that some bat mortality or injury would occur as a result of the proposed project, however since few bat mortalities have been observed near transmission lines compared to bird mortalities, it is unlikely that the proposed project would be a significant cause of bat mortality or have significant impacts to bat populations.

26-49
Please see Response 26-42 and 26-46.

26-50
USFWS and BPA are having ongoing discussions about appropriate mitigation measures for changes to shrub-steppe wildlife habitat resulting from the proposed project. Please see Response 10-5.

26-51
Section 4.5.2.2 of the FEIS has been updated to reference EMF information that is available in Appendix G.

26-52
Please see Response 26-7.

26-53
The designation for FP (Federal status Proposed) has been added to Table 4.5-3.

26-54
Table 4.6-1 in the DEIS and FEIS grouped land uses into five broad categories. "Preservation" as a specific land use is included in the forest, range, and agriculture categories.

Impacts from construction activities on lands within the Hanford Reach National Monument designated as "preservation" are not discussed in Section 4.6.2, *Impacts Common to Construction Alternatives*, because these impacts are not common to all alternatives or line segments. Instead, these impacts are discussed in the individual environmental consequences sections for Segments D, E, and F, which are the three segments that cross the lands designated as preservation (Sections 4.6.3.3, 4.6.4.2, and 4.6.6.1 in the DEIS). In addition, each of these sections indicates that impacts from Segments D, E, and F would include the loss and degradation of wildlife habitat, increased habitat fragmentation, and increased human disturbance to wildlife.

26-55
Please see Responses 10-3, last paragraph of 10-4, 10-5, and 18-5.

26-56
For Segments E and F, the impact to lands designated as "preservation" within the Hanford Reach National Monument was rated high in the DEIS.

For Segment D, the impact to lands designated as "preservation" within the Hanford Reach National Monument was originally rated moderate in the DEIS. The impact rating has been adjusted to high in the FEIS. However, due to the limited distance that the Preferred Alternative (the Segment D portion) is located within this "preservation" area in relation to the entire Preferred Alternative

(Segments A, B_{SOUTH}, and D), the overall land use impacts from this alternative remain moderate to high.

26-57
Most disruptions to recreational trail users would be expected to occur along the 22-mile stretch of the John Wayne Trail owned and managed by the YTC. Current YTC policy states that sections of the trail may be temporarily closed for safety purposes as directed by the installation Commander. Visitors wishing to use the John Wayne Trail on the YTC must sign in and out in-person daily at the Operations Center and may enter the YTC at one of two authorized entry points. Organized activities, tours, and events must be approved in advance of arrival at the trailhead by contacting the YTC Environment and Natural Resources Division. Trail users would be informed of any temporary construction-related closures if they call the YTC in advance of arrival or when checking in with the Operations Center and the entry points. Directions to the nearest open portions of the trail would be provided.

Information concerning temporary closures to the trail will be passed along to the local visitor association in the County of the closure. Any users calling the association would be able to get trail closure information. In addition, directions around the closed areas and back to the John Wayne Trail would be provided on signs indicating trail closures.

26-58
Please see Response 26-5.

26-59
Please see Response 26-5.

26-60
BPA did not intend to imply in the DEIS that the cumulative impacts would be significant. The FEIS discussion of cumulative impacts on cultural resources has been changed to correctly reflect what would occur.

26-61
Please see Response 10-4.

26-62
Please see Response 26-45.

26-63
Appendix D, Line Separation Issue Paper, has been revised to include a discussion on risk elements and a justification for line separation distances.

26-64
Please see Response 10-3.

26-65
The map was left out of Appendix H in the DEIS by mistake. In an effort to protect known cultural resources, the complete Phase 1 and Phase 2 studies are not included as an appendix to the FEIS;

however, results of the surveys are summarized in Chapters 3 and 4 of the FEIS. Please see Response 26-5 regarding additional detail on cultural resources added to the FEIS.

26-66
The FEIS includes all direct, indirect, and cumulative impacts to fish and wildlife and their habitats, cultural resources, and Hanford Reach National Monument/Saddle Mountain Unit lands resulting from construction, operation, and maintenance of the proposed project.

27-1
Under its responsibilities to Section 106 of the NHPA, BPA determined that the proposed action for the Schultz-Hanford Area Transmission Line Project was a federal undertaking that had the potential to cause effects on historic properties. In a letter to Ms. Adeline Fredin dated April 8, 2002, BPA, pursuant to 36 CFR 800.4(a)(4), initiated formal consultation with the Confederated Tribes of the Colville Reservation (CCT). BPA and the CCT had their first consultation meeting on July 2, 2002.

27-2
The Cultural Resources sections in the FEIS have been revised to reflect changes discussed with the CCT and USFWS. Additional information from the surveys conducted along the Preferred Alternative has also has been summarized in the FEIS. Map 11 has been removed from the FEIS.

27-3
The definition of "lithic" has been corrected, the extra "the" removed, and the table of contents has been modified.

27-4
We apologize for the oversight of omitting the project map in the Appendix H technical report. Please see Response 26-65.

28-1
BPA, as a federal agency, has the discretion and expertise to define the purpose and need for the action that it is proposing to take. BPA has defined the need for action for this project in Section 1.1 in the DEIS and FEIS. BPA has added a section in the FEIS under Section 2.7, *Alternatives Eliminated from Detailed Consideration*, that describes BPA's study of non-transmission line alternatives, including those identified in this comment letter. Please see Response 19-2.

28-2
At the time the DEIS was developed and distributed to the public, BPA included all information then available regarding project design, affected environment, subsequent impacts, and recommended mitigation. Because BPA has incorporated avoidance of environmental impacts into its design criteria (i.e., the engineering and environmental information are shaped through an iterative matrix approach to formulate the least damaging, practical project design), much of the final design information occurs after obtaining information from public input received from the publication of the DEIS. The prior method of project design involved a phased approach, where the first phase concentrated on transmission line requirements, and did not address environmental criteria (avoidance, minimization, and compensation) until transmission criteria were firmly established. Unfortunately, under our current approach, complete transmission design information is not available until a later stage in the NEPA process. However, BPA believes this matrix approach is consistent with the mandate of Section 102(2)(A) to "utilize a systematic, interdisciplinary approach which will insure the integrated

use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment."

As more design information becomes available, analysis of impacts continues. Meetings occur with agencies and tribes to discuss more detailed design information, expected impacts, and mitigation. On federal lands especially, other agencies define for BPA their expected requirements for mitigation.

The FEIS has been updated with new information. The ROD will outline BPA's decision and commitment to mitigation. If BPA decides to construct one of the alternatives, BPA will then prepare a Mitigation Action Plan as required by the USDOE Guidelines Implementing NEPA. The Mitigation Action Plan will include further mitigation detail.

BPA does not conduct on-the-ground intensive surveys for cultural resources (including TCP sites), sensitive, or threatened and endangered plants and animals for all alternatives, nor does NEPA require such intensive surveys. NEPA only requires a "reasonable" discussion of impacts and mitigation. Please see Response 14-4.

28-3
The mitigation sections of the FEIS have been updated with new information where available. Please see Response 28-2.

28-4
The affected environment, impact, and mitigation sections of the FEIS have been updated with new information.

28-5
BPA has tried to provide greater clarity on our mitigation plans. As stated above, BPA will complete a Mitigation Action Plan if BPA decides to construct one of the alternatives. NEPA does not require a complete disclosure of precise mitigation commitments, but only a reasonable discussion of how mitigation will be accomplished. Please see Responses 28-2, 28-3, and 28-4.

28-6
Please see Responses 28-2, 28-3, 28-4, and 28-5.

28-7
As explained in Chapters 3 and 4 of the DEIS and FEIS, all existing substations for this project have Spill Prevention Control and Countermeasure Plans in place. These plans outline protocols and procedures for response in case an oil spill or leak occurs at these substations. The plans do not provide details on the effects of an oil spill occurring at these substations.

A Spill Prevention Control and Countermeasure Plan would be developed for the new substation and the plan for Schultz Substation would be modified to include and address the new equipment to be added at the substation. Commitments to prepare and update these plans were stated in the FEIS. The protocols and procedures used to respond to a spill or leak function as the best mitigation in case an oil spill or leak occurs.

28-8
The Mitigation Action Plan would provide details on the mitigation measures that BPA would commit to doing. Some mitigation does not require monitoring. Other mitigation may require monitoring. Federal agencies that manage lands proposed to be crossed by the project may require monitoring of certain mitigation measures. BPA's preference is to provide funds to the federal agencies that manage these lands for monitoring because they have the most knowledge of the land and resources present. The details on monitoring are still being determined.

28-9
The Segment A Reroute was developed in response to anticipated delays or possible inabilities to acquire new ROW easement and renewing existing easement across tribal allotment land. This has been clarified in Chapter 2 and Appendix B was added to the FEIS to describe Segment A Reroute in greater detail.

28-10
Appendix B of the FEIS has been written to clearly state more detailed information on the affected environment and potential impacts of the Segment A Reroute.

28-11
The rationale for developing the B_{SOUTH} segment has been added to Chapter 2 of the FEIS.

B_{SOUTH} was developed in response to a request by the Army, whose land is crossed by both of the B_{NORTH} and B_{SOUTH} segments. The Army has concerns with the 1,200-foot separation between the existing line and the new B_{NORTH} line. The impacts associated with B_{NORTH} line separation would adversely affect Army maneuvers and would increase the potential for aircraft collisions with the lines. The Army suggested paralleling existing lines located farther to the south (B_{SOUTH}) in order to minimize the line separation distance.

29-1
The proposed project is a federal project owned, operated, and maintained by the BPA. Therefore, obtaining county-level approvals would not be required. BPA would work towards meeting or exceeding the substantive standards and policies of the county zoning and critical area ordinances and comprehensive plans.

30-1
BPA will consider whether or not the line could be moved. Currently it is adjacent to an existing line. To move the line further to the east and away from the house and its view could be difficult due to the steep terrain. The line's proximity to other homes to the east also would need to be balanced in this consideration.

31-1
Comment noted.

31-2
BPA agrees that the Preferred Alternative is a good balance between cost and impacts.

31-3
Comment noted.

32-1
Comment noted.

33-1
Your phone number and request to be notified before entry has been added to the Permission to Enter Property form that you signed.

34-1
BPA has contracted with the Yakama Nation to complete a cultural resource survey of the Preferred Alternative. The goal is to minimize adverse impacts to Native American sites along the route.

35-1
Impacts of the different alternatives are analyzed in the EIS.

35-2
Comment noted.

35-3
BPA will negotiate easements with the landowners along the Preferred Alternative.

36-1
Comment noted.

EL-1
BPA will consider weather conditions during the construction phase to minimize erosion and rutting potential. BPA will also upgrade existing access roads so that if the weather were to bring considerable moisture, travel can still take place without substantially increasing erosion. Some construction also could take place in the winter when the ground is frozen.

EL-2
No in-water work would be performed in Naneum Creek. Existing crossings would be utilized for access.

EL-3
BPA will take this into consideration. If this is an existing access road, BPA will continue to use it for the existing line and the new line. BPA needs access to every structure for construction, maintenance, and emergency purposes. BPA will design creek crossings so as to minimize impacts to the water and surrounding vegetation.

EL-4
The new proposed line would have no effect on Bowers field. BPA will be coordinating with the FAA to determine if any portion of the facility needs to be marked so as to be better seen from flying aircraft.

EL-5
Because rattlesnakes are not protected or listed under state or federal regulations, they were not surveyed. However, large numbers of snakes have been observed in the rocky areas between Wilson and Naneum Creek and east of Naneum creek by survey crews and other field personnel on the

project. Existing access roads will be used where possible to minimize impacts to rattlesnake den sites.

EL-6
Comment noted.

EL-7
If there is an existing ongoing noxious weed program by the county to eradicate weeds, BPA participates. If there is no noxious weed program by the county, it is ineffective to eradicate weeds on BPA ROW only to have the ROW reinfested with weeds in a short time period. BPA works closely with counties and participates in their weed programs. BPA also works with landowners on weed issues. Your concerns have been passed on to our maintenance personnel.

EL-8
Unfortunately, this comment is not specific enough for BPA to reply.

EL-9
BPA would acquire approximately 47 acres for the Wautoma Substation. The substation footprint would be approximately 500 feet by 800 feet.

EL-10
BPA agrees.

EL-11
Comment noted.

EL-12
Comment noted.

EL-13
It appears that this comment is by the same person who wrote 30-1, but the BPA representative who recorded this switched the directions the landowner wanted the line moved. Please see comment 30-1 for the response.

EL-14
Please see Response 26-10.

EL-15
Comment noted.

EL-16
At some point in the future additional transmission capacity may be required to support load growth in the Puget Sound area. However, the timing for this addition depends on load growth and where new generation is developed.

EL-17
Please see Response 10-3.

EL-18
The Schultz Substation was constructed to address the Puget Sound voltage stability problems identified in the late 1980s. At that time, when the largest lines (Coulee-Raver lines) feeding the Puget Sound went out, they would cause voltage stability problems. Schultz Substation was built to add a cutoff for the Coulee-Raver lines. The multiple lines that are tied into Schultz Substation limit the severity of outages on the Coulee-Raver lines and provide backup routes for the electricity.

EL-19
Preliminary studies indicate that this project will increase the transfer capability north of Hanford by approximately 600 MW and reduce or eliminate remedial action schemes (RAS) for single-line outages.

EL-20
The line is proposed to be located on the northeast side of the existing 500-kV line in the Cooke Canyon vicinity.

EL-21
Please see Response 7-3.

EL-22
Thank you for reporting this encounter with appraisers. BPA has advised their appraisers that respect must be shown to all landowners in conducting interviews and appraisals.

EL-23
BPA can only acquire land rights needed for the particular project. The impact of introducing a new ROW for transmission towers and lines can vary dramatically depending on the placement of the ROW in relation to the property's size, shape, and location of existing improvements. A transmission line may diminish the utility of a portion of property if the line effectively severs this area from the remaining property (severance damage, as defined in the "Uniform Appraisal Standards for Federal Land Acquisitions"). The landowner would be compensated for the value of the transmission line ROW easement as well as the severance damage, if any. If no utility is left to the remainder of the property, then BPA would offer to acquire the entire parcel.

EL-24
BPA personnel and its contractors contact landowners prior to entering private property if the landowner designated this request on their Permission to Enter Property form.

EL-25
BPA has contacted all the counties crossed by this project and will meet with any county officials who express an interest.

EL-26
Comment noted.

EL-27
Please see Responses 21-1, 21-2, and 26-10.

EL-28
In past instances, some transmission lines have been reconductored for loss savings and/or to reduce noise levels. However, in most cases, transmission lines are typically considered for reconductoring once the operating temperature of the existing conductor has been upgraded to its maximum capability. This is accomplished by resagging the line, removing insulators or soil beneath the limiting line sections.

EL-29
Please see Response 10-3.

EL-30
BPA will minimize the construction of new roads. BPA wants to work with individual landowners to install gates and maintain gates. BPA also does not want the public on BPA ROW.

EL-31
Unfortunately that sometimes happens. BPA does tell its personnel and the contractors to keep the gates shut unless previously arranged with the landowner while construction takes place.

EL-32
Human population densities within the study area were identified in the DEIS and FEIS as sparsely populated. This is due to all of the segments crossing through rural areas where no population centers are located (refer to Section 3.8.1). It is not expected that population densities would increase as a result of the project; however, population growth and associated densities may decrease if transmission capacity is not increased.

EL-33
Please see Response 10-3.

EL-34
The difference in tower types is that one tower type can carry more conductor weight than another and also carry higher voltage wires, overhead groundwire, and communication wires. Some towers, dead end towers, are much heavier so they can support changes in conductor tension and support angles as the line changes direction.

EL-35
Unfortunately, due to security reasons, BPA cannot include a map in the FEIS that shows tower locations. A BPA representative would be available to meet with you on your property if you have any questions as to where a tower may be located.

EL-36
Please see Response 7-3.

DA-1
BPA will try to schedule activities to avoid or minimize crop damage.

DA-2
Please see Response 7-1.

DA-3
BPA agrees that paralleling next to an existing line would reduce overall impacts as compared to a non-parallel line. The Preferred Alternative, as compared to the other alternatives, has the most segments where the new line is immediately parallel to an existing line. Towers are immediately adjacent to the existing towers at Crab Creek. Tower locations are determined after surveys (wildlife, plant, and cultural) have been completed and design has been determined. New tower sites and new access roads have been located to avoid sensitive plant areas to the extent practicable. The Preferred Alternative includes one area where existing towers would be replaced with new double-circuit towers. New towers would be placed next to or near existing roads where feasible. BPA does not want to build new roads if not necessary, so BPA balances the location of new towers and their costs and impact to the costs of adding new roads and their impacts to find an overall best solution that minimizes costs and minimizes impacts to land uses and the natural environment.

DA-4
Thank you.

DA-5
Please see Response DA-3.

DA-6
Please see Response DA-3.

DA-7
Please see Response DA-3.

DA-8
Please see Response DA-3.

DA-9
Please see Response DA-3.

DA-10
Please see Response DA-3.

DA-11
Please see Response DA-3.

DA-12
Please see Response DA-3.

DA-13
All transmission lines have insulators connecting the conductor to the towers. At road crossings, BPA uses double insulators to increase reliability and decrease the risk that any of the conductors would release from a tower. At road crossings, BPA also increases the distance from the ground to the lowest conductor.

DA-14
Federal facilities, including BPA facilities, are exempt from local taxes, including property tax. There may be some lost income for some local areas due to small decreases in property value. BPA only purchases rights across private properties. The property still remains in private hands and is therefore still taxed. For those situations where BPA purchases the property, as for the Wautoma Substation site, property tax revenue would be lost to the local county. Through the construction of these new facilities, more businesses are able to locate in Washington and other areas. As a result, the overall impact to local counties could be positive with increased property values and various tax revenues in other areas as a result of new businesses and new residences.

DA-15
Wind farms cannot be directly connected to this new 500-kV facility. A 75-MW generation facility would likely need to be connected to lower voltage lines which in turn, would be connected to the larger lines, such as the proposed Schultz-Hanford line. If someone wants to connect a new generation facility to the BPA system, they would need to contact BPA directly and pay for a study to be done to identify the system upgrades that may need to be done. If you have any questions concerning connecting a generation facility, please contact Mike Raschio at 503-230-3000.

DA-16
BPA has looked at the location immediately west of the Columbia River associated with the railroad route. There is no existing transmission line facility there now so this would be a brand new location with no benefit of existing roads or towers. BPA prefers to locate new facilities adjacent to existing transmission line facilities to minimize impacts. There would be numerous environmental impacts in the location immediately west of the Columbia River such as crossing streams right at their mouth into the Columbia River, visual impacts to those people who overlook the river from the east side, sensitive plants, cultural sites, etc. There are an infinite number of possible alternative locations. The location suggested is not substantially better than the location of the alternative that already crosses the YTC that also has numerous environmental and land use impacts. BPA will not consider the location immediately west of the Columbia River any further.

DA-17
Please see Response DA-16.

DA-18
The Preferred Alternative includes crossing lands that support orchards and vineyards. To reduce the impacts on these crops, BPA proposed to replace the existing line with a double-circuit line between Vantage and Midway Substations. BPA will also work with local landowners to determine the best location for the new double-circuit towers and associated access roads. BPA will also try to construct the new line during the period when crops have already been harvested or the crops, such as orchard trees, are dormant.

DA-19
The new line will not be connected to either the Vantage Substation or the Midway Substation.

DA-20
BPA tries to design their public meetings to fit the communities affected by the project. In many cases, that means that BPA employees and contractors wear casual clothing instead of business attire.

The idea of BPA employees wearing BPA logo shirts for easy identification is good and will be sent to management.

DA-21
The Preferred Alternative is located so as to minimize impacts to land use and the natural environment, while keeping system reliability risks as low as practicable.

DA-22
Please see Response DA-21.

DA-23
Yes, a Mitigation Action Plan will be prepared for the entire project.

DA-24
BPA will coordinate with the FAA to determine which structures/conductors need to be marked, if any. BPA does design to FAA requirements.

DA-25
Comment noted.

DA-26
The on-the-ground cultural resource survey began in April 2002. Results are summarized in the FEIS.

DA-27
The Cultural Resources Program of the Yakama Nation and their contractor were responsible for the cultural resource ground survey.

RI-1
Each project has its own energization date. McNary-John Day, Starbuck Power Project and Wallula-McNary are all on hold until financing is secured. Kangley-Echo Lake has an energization of winter 2003/2004. Grand Coulee-Bell and Schultz-Hanford Area both have energization dates in late 2004. The Schultz Series Capacitors is to be energized in fall 2003 and Celilo Modernization in fall 2004. The Monroe-Echo Lake project has no defined energization date at this time.

RI-2
BPA will minimize the construction area through shrub-steppe habitat and keep the footprint of the transmission line and roads to a minimum.

RI-3
Please see Response 10-6.

RI-4
Comment noted.

RI-5
BPA prefers to locate new facilities adjacent to existing facilities to minimize overall impacts to land use and the natural environment. The Preferred Alternative contains the shortest route across the Monument. Please note that Alternative 3, the only alternative that does not cross the Hanford

Reach National Monument, has greater environmental impacts than the alternatives that cross the Monument.

RI-6
Please see Responses 10-3 and 18-5.

RI-7
The maps have been revised to correctly label the Hanford Site.

RI-8
BPA apologizes for any confusion the maps have caused. The discrepancies that BPA knows of have been corrected.

RI-9
Map 8 in the DEIS showed the Preferred Alternative and the other alternatives overlaid onto the Hanford Site, including the Hanford Reach National Monument. Map 8 also shows this in the FEIS.

RI-10
The document does not have a specific section for the Hanford Monument; however, within the impact discussions for the Preferred Alternative and Alternatives 1 and 1A impacts on resources within the Hanford Reach National Monument are specified within Segments D, E, and F respectively.

RI-11
BPA has analyzed the impacts to vegetation, wildlife, and visual resources within the Hanford Reach National Monument and has developed mitigation to minimize impacts to those resources.

RI-12
BPA is working closely with USFWS concerning the crossing of the Hanford Reach National Monument and Crab Creek areas as well as impacts in general on other resources such as sensitive plants and wildlife species.

RI-13
Please see Response 10-6. Admittedly, the Summary would have been much clearer had the map not been inadvertently left out of the publication; however, BPA will not re-issue the draft Summary with a map. The DEIS included all of the maps and a reader could have requested the entire document if desired.

RI-14
Please see Response 10-5.

RI-15
The Summary has been revised for the FEIS.

RI-16
BPA determines the value of the property impacts before the construction of the new facility as compared to the value of the property after the construction of the new facility. BPA also uses very recent land sales to determine land values. If a landowner is no longer able to use a piece of land

due to BPA's new facility, BPA would consider purchase of the entire parcel, such as a small lot where the new line would take up most of the lot and the remainder is not large enough for a house or building.

RI-17
The Preferred Alternative has the least overall impacts to land use and the natural environment.

RI-18
Please see Response 18-2.

RI-19
BPA has contacted DOE. No impacts are expected to the Laser Interfermetric Gravitational Observatory operations.

Chapter 7 — EIS Preparers

WILLIAM H. BAILEY, Ph.D., Principal Scientist and Health Practice Group Manager, Exponent. Contributor to *Appendix J, Assessment of Research Regarding EMF and Health and Environmental Effects*. Education: Ph.D., Neuropsychology, M.B.A., Post-doctorate neurochemistry. Experience: Thirty years' experience in laboratory and epidemiologic research, health risk assessment, comprehensive exposure analysis, and research on potential health effects of electromagnetic fields.

KATHRYN BECK, Botanist, Beck Botanical Services. Responsible for botanical and vegetation analysis. Education: B.S., Environmental Sciences, B.A., Biology. Experience: 18 years of experience with rare plant surveys, botanical inventory, resource management, and vegetation mapping and analysis.

T. DAN BRACKEN, Ph.D., T. Dan Bracken, Inc. Principal author of electrical and magnetic effects and public health and safety sections. Education: B.S., M.S., and Ph.D., Physics. Experience: Involved in research and characterization of electric and magnetic-field effects from transmission lines for over 27 years, as a physicist with the BPA from 1973 to 1980, and since then as a consultant.

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LAURENS C. DRIESSEN, Project Manager. Responsible for overall project management, engineering information and review. Education: B.S., Civil Engineering. Experience: Facility siting and project management. With BPA since 1969.

JOSEPH DUDMAN, Research Assistant, T. Dan Bracken, Inc. Provided data entry, graphics, and clerical support in the preparation of *Appendix I, Electrical Effects*. Education: B.A., Sociology/Anthropology. Experience: 13 years' experience.

LINDA S. ERDREICH, Ph.D., Epidemiologist/Managing Scientist, E^x^ponent. Contributor to *Appendix J, Assessment of Research Regarding EMF and Health and Environmental Effects*. Education: Ph.D., Epidemiology. M.S., Biostatistics and Epidemiology. Experience: For government and private industry, researches and evaluates public and occupational health impacts of electric and magnetic fields. For the U.S. Environmental Protection Agency, served as Acting Section Chief and Group Leader of the Methods Evaluation and Development Staff, and Senior Epidemiologist of the Environmental Criteria and Assessment Office.

ANGELA FINDLEY, Environmental Planner, Parsons Brinckerhoff. Responsible for socioeconomics analysis. Education: M.S., Forest Resources; B.A. Mathematics. Experience: Over 10 years' professional experience in environmental planning and permitting. With PB since 1998.

DENNIS GRIFFIN, Cultural Resource Specialist, Archaeological Frontiers. Responsible for cultural resource investigation and documentation of information used in cultural resource section of the FEIS, Education: PhD. Anthropology, M.A. Interdisciplinary Studies, B.S. Liberal Studies, B.S. Anthropology. Experience: Over 20 years experience performing cultural resource investigations, with Archaeological Frontier till 2002.

PAULA HARTZELL, Archaeologist, Pacific Projects (subcontracted researcher to the Confederated Tribes of the Colville Reservation History/Archaeology Department). Responsible for cultural resources records research and reporting for Draft EIS. Education: B.A. Anthropology. Experience: Over 10 years as federal agency and self-employed archaeologist.

JAMES HENCKE, Landscape Architect, Parsons Brinckerhoff. Responsible for visual resources analysis. Education: B.S., Landscape Architecture. Experience: Fourteen years' professional experience in planning, urban design, landscape architecture, site and community planning. With PB since 2000.

BRENT HICKS, Project Archaeologist, Confederated Tribes of the Colville Reservation History/Archaeology Department. Responsible for project management and administration, reporting and editing all deliverables for Draft EIS. Education: M.A., Anthropology. Experience: Over 10 years in private and self-employed cultural resources management consulting; over five years with the Colville Tribe.

BARBARA HUTCHINSON, Editor, Parsons Brinckerhoff. Responsible for general editing and formatting of the EIS. Experience: Technical editing and document coordination experience for engineering firms. PB employee since 1998.

KYLE KOHNE, Electrical Engineer, BPA. Responsible for technical network planning studies. Education: B.S., Electrical Engineering. Experience: Electrical transmission grid planning. With BPA since 1991.

LINDA KRUGEL, AICP, Planning Consultant. Responsible for public involvement. Education: B.S. Related Arts, M. of City Planning, M. of Public Administration. Experience: Policy development and public involvement; contractor to BPA from 1984 to 2001.

JUDITH H. MONTGOMERY, Ph.D., Judith H. Montgomery Communications. Technical editor for *Appendix I*, *Electrical Effects*. Education: B.A., English Literature. Ph.D., American Literature. Experience: Over 20 years providing writing, editing, and communications services for government and industry. Preparation of NEPA documents and technical papers on transmission line environmental impact assessment and other utility-related activities.

KATHRYN MOORE, Technical Editor, TW Environmental, Inc. Responsible for final editing of the FEIS. Education: B.A., Communications, English minor. Experience: 18 years of technical editing and writing experience, primarily in engineering and planning. TW Environmental employee since 1996, full-time since 1999.

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LEROY P. SANCHEZ, Visual Information Specialist, BPA. Responsible for EIS graphics. Education: Graphic Design, University of Nevada, Las Vegas 1970-1973; Portland State University 1983-1985. Experience: EIS graphics coordination, cartographic technical duties; BPA employee since 1978.

SCOTT SMITHLINE, Deputy Contract Manager, Parsons Brinckerhoff. Responsible for water quality, soils and geology sections. Education: B.S., Environmental Science; additional undergraduate studies in Engineering. Experience: Five years' professional experience in environmental and engineering sciences including resource assessment, permitting, water quality analysis, noise monitoring, and preparation of SEPA documentation. With PB since 1998.

KIMBERLY ST. HILAIRE, Environmental Protection Specialist, BPA. Responsible for Draft EIS - Vegetation, Wetlands/Floodplains sections. Education: J.D., Environmental Law, M.S., Teaching Biology, B.S., Biology. Experience: Ten years' experience as a natural resources consultant. BPA employee since April 2001.

PATRICK SWEENEY, ASLA, Landscape Architect, Parsons Brinckerhoff. Responsible for gathering land use data and impact assessment. Education: B.S., Landscape Architecture. Experience: Over 10 years' professional experience in urban design, landscape architecture, and site and community planning. With PB since 2000.

STEVEN TROMLY, Archaeologist, BPA. Responsible for coordination of data collection and report review for literature review used in Draft EIS cultural resource section. Education: M.A., Anthropology. Experience: Over 15 years in federal agency, private and self-employment. BPA employee since March 2002.

IVY TYSON, Project Engineer, BPA. Responsible for transmission line engineering, including line siting, tower spotting, tower siting, and conductor sagging. Education: B.S., Mechanical Engineering. Experience: Six years' experience in facilities engineering, four years' transmission line design engineering and project management. With BPA since 1990.

NANCY A. WITTPENN, Environmental Specialist, BPA. Responsible for coordination and completion of environmental review requirements. Education: B.S., Geology, M.S. Marine Geophysics. Experience: Environmental analysis and natural resource management; with BPA as a contractor and employee since 1989.

MARIAN A. WOLCOTT, Realty Specialist, BPA. Responsible for property value analysis. Education: B.S., Forest Management. Experience: Forestry appraisal and Land Branch project coordination; with BPA as a contractor and employee since 1985.

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Chapter 8 — EIS Recipients

The project mailing list contains over 4,000 potentially interested or affected landowners; tribes; local, state, and federal agencies; utilities; public officials; interest groups; businesses; special districts; libraries; and the media. They have either directly received or been given instructions on how to receive all project information that is currently available, including the DEIS and will have the opportunity to review the Final EIS.

Federal Agencies

- National Oceanographic and Atmospheric Administration, National Marine Fisheries Service
- U.S. Army Corps of Engineers
- U.S. Bureau of Land Management
- U.S. Bureau of Reclamation
- U.S. Department of Energy
- U.S. Department of Natural Resources
- U.S. Department of the Army
- U.S. Environmental Protection Agency
- U.S. Fish & Wildlife Service
- U.S. General Service Administration

Tribes or Tribal Groups

- Colville Confederated Tribes
- Umatilla Confederated Tribes:
  - Department of Natural Resources
  - Economic Development Power Plant Project
- Nez Perce Tribe
- Wanapum Band
- Yakama Nation

State Agencies, Washington

- State of Washington Department of Ecology
- State of Washington Department of Fish & Wildlife
- State of Washington Department of Natural Resources
- State of Washington Department of Social and Health Services (DSHS)
- State of Washington Department of Transportation
- Washington State Patrol

Public Officials, Washington

- Federal Congressional Representatives:
  - Maria Cantwell
  - Patty Murray
  - Doc Hastings
  - George R. Nethercutt, Jr.
- Governor Gary Locke
- State Senate:
  - Linda Evans-Parlette
  - Harold Hochstatter
  - Alex Deccio
  - Jim Honeyford
  - Patricia Hale
- State Representatives:
  - Gary Chandler
  - James Clements
  - Joyce Mulliken
  - Mary Skinner
  - Bruce Chandler
  - Barbara Lisk
  - William Grant
  - Dave Masten
  - Jerome Delvin
  - Shirley Hankins

Local Governments, Oregon

- City of Sublimity

Local Governments, Washington

- Cities of:
  - Beverly
  - Ellensburg
  - Moxee
- Counties of:
  - Benton
  - Franklin
  - Grant
  - Kittitas
  - Yakima
- Ports of:
  - Mattawa
- Fire District #8 (Mattawa, WA)
- Fire District #10 (Royal City, WA)

- Fire Protection District #4 (Yakima, WA)
- Kittitas County Hospital District 1

Businesses

- 3-B Farms
- 77 Inc.
- A&J Farms, Inc.
- AB Hop Farms
- ACL Company, LLC
- AHG Related Properties, LLC
- Alamo Orchard
- Alderman Partnership
- Altos EZ Mat, Inc.
- Allstate Insurance Company
- Anchor JM LTD Partnership
- Anderson & Anderson
- Anderson Corporation
- Anderson Development Properties, LLC
- Anderson Hay & Grain Company
- Anderville Farms, Inc.
- Argentea Environmental
- Auvil Fruit Company
- Avenir Corporation
- B&W Enterprises
- BT Loftus Ranches, Inc.
- Bank of America
- Bank of New York
- Bar 14 Ranch House Restaurant
- Belsaas & Smith, Inc.
- Beneficial Mortgage Company
- Bob Kelley Realty, Inc.
- Boulder River, LLP
- Bowers Field Airport
- Brookwood Associates
- Brothers Ventures, LLP
- Brown Boy Feed, Inc.
- Brown Brothers
- Burk Wahluke Enterprises

- Burlington Northern and Santa Fe Railway
- Byrd & Barnes Partnership Columbia, LLC
- C&C, LLC
- Calaway Trading Inc.
- Caribou Land & Cattle, Inc.
- Cascade Hop Farms, LLC
- Cascade Manor Associates
- Central Washington Mental Health
- Charlton Kimball Company
- Circle B Farms
- Cliffacres Orchards Inc.
- CMA Motels, Inc.
- Columbia Fruit Holdings, LLC
- Columbus Properties, LLC
- Cooke Coleman, LLC
- Coombs Ranch, PTN
- Copeland Lumber Yards, Inc.
- Coventry Vale Winery, Inc.
- CP Northwest, LLC
- Crescent Properties, Inc.
- Crosier Orchards Inc.
- D&A Properties
- D&D Orchards
- D&M Motors Inc.
- D M Construction Inc.
- David Evans & Associates
- Davidson Building Partnership
- Den Beste Farms
- Desert Rose, LLC
- Desserault Ranch, Inc.
- Docs A Partnership
- Dry Creek Acres, LLC
- DSC Properties, LLC
- Ecorehab
- Elbee Orchards, LLC
- Elkhorn Ranch
- Ellensburg Lamb Company, Inc.

- Ellensburg Market Poperties, Inc.
- Ellensburg Property, LLC
- Equilon Enterprises, LLC
- Fairway Investments, LLC
- Faltus Motor Company, Inc.
- Faust & Rudolph, LLC
- First Interstate Bank of Washington
- Flying X Ranch
- Frontier Tavern
- Four Feathers Fruit Company
- G&F Investments
- Gallery One
- Graf Investments, Inc.
- Grebb Johnson Reed & Wachsmith
- Gunning Casteel Real, Inc.
- Halverson & Applegate PS
- Hammerstad Holdings
- Harris Farms, Inc.
- Hatlestad Investments, Inc.
- HFSC Funeral Services of Washington, Inc.
- HG White Family Enterprises
- Hill Toppers
- Household Finance Corporation III
- Huntington Court Housing Associates
- Integrated Resource Consultants
- J E M B Investment Corporation
- Jeff Gamache Farms, Inc.
- Jon B. Jolly, Inc.
- Jumpin Jack
- Kayser Ranch, Inc.
- KB Farm Inc.
- Kelleher Motor Company
- King Fuji Ranch, Inc.
- Kittitas Company Publishing, LLC
- Kittitas Valley Bank #1
- Kittitas Valley Land Developers, LLC
- Krugel & Associates

- L&C Dynasty
- L&E Limited Partnership
- L&M Farms, Inc.
- Land Development Pro & Services
- Lands Associates
- Legal Properties
- Lenseigne & Lenseigne
- Lenseigne Farms
- Les Schwab Tire Center
- Libenow Properties, LLC
- Main Street Square, LLC
- Martinez Simon Livestock, Inc.
- Matson Fruit Company
- McDonalds Corporation
- McDougall & Sons, Inc.
- McDowell Properties, LLC
- McNeight Express, Inc.
- Medical Eye Care
- MF Williams Construction Company
- Midstate Aviation, Inc.
- Miller's Refrigeration and Appliance Service
- Moriah Valley Enterprises, Inc.
- Mountain River Ranch Corporation
- MTA Holdings LLC
- Myers Partnership
- National Food Corporation
- NHD Company, LLC
- N W L Ranch, Inc.
- Ocwen Federal Bank FSB
- Okan-Sea Transport Company, Inc.
- Okanogan Seattle Transportation
- Pacific Exchange Company
- Pacificorp
- Palace Restaurant, Inc.
- Par Five, Inc.
- Paradise Investments
- Parsons Brinckerhoff, Inc.

- Pautzke Bait Company, Inc.
- Peter J Young & Son
- Phoenix Group
- Pine Street Station Investment Group
- PJ Taggares Company
- Plath Orchard Company
- PM Management, Inc.
- Preston Gates & Ellis
- Prudential Insurance Company
- R&A Eckenberg Farms
- Raven Orchard, LLC
- RJ Wilson Steel
- RNKC, LLC
- Roche Pomona Orchards
- Rockside Development Corporation
- Rocky V Orchard
- Rosewood Development DBA Greywolf Properties
- Roundup Company
- Roy Farms, Inc.
- Safeway Stores, Inc.
- Saint Michelle Vintners, Inc.
- Samis Land Company
- Saratoga Passage Development
- Schaake Packing Company
- Seco Financial Group, Inc.
- Security National Properties, LP
- Sentinel Gap Water Association
- Shaw Chiropractic Center
- Shushuskin Properties
- Signal Investments & Champion Pac & Dekk Associates
- Silver Dollar Cafe
- Simon Martinez Livestock, Inc.
- Singh, Inc.
- Six B Farms, LLC
- Sonrise Orchards
- South Eighty Orchards PTN
- Stalder Interests, Inc.

- Sterling Savings Association
- Stockdale, Inc.
- Sun Air Aviation
- Sundown M Ranch, Inc.
- Sundquist Fruit & Cold Storage, Inc.
- Sunfresh, Inc.
- Sweetgrass Investments, LLC
- T. Dan Bracken, Inc.
- Taco Bell of America, Inc.
- Tandem Builders, Inc.
- Taylor Investment Group Ltd.
- Teisseire Associates
- Time Oil Company
- Tire Centers, Inc.
- TNT Orchard, LLC
- Tower Investments
- Town Investments LLP
- Transhumance, Inc.
- Tum A Lum Lumber Company
- Twin City Foods, Inc.
- United Builders of Washington, Inc.
- University Place, LLC
- U.S. Bancorp 2701
- V Nickel & Associates, Inc.
- Van de Graaf Ranches, Inc.
- Van Horn Farms, Inc.
- Voshall Mini Storage and Voshall Electric
- Wahluke Hay & Supply Company
- Ward Rugh, Inc.
- Washington Fruit & Produce Company
- Washington Waste Haul & Recycling, Inc.
- Wells Fargo Bank
- Welsh Etter Investment Company
- Wenatchee Petroleum Company
- West Ranch Development
- Western Feed Supplements, Inc.
- Windemere Real Estate

- Winding Brook Corporation No. 71
- Winegar's Drive-In Dairy
- Wondrack Distributing
- Woods Hardward, Inc.
- WW & Association
- Wyckoff Farms, Inc.
- Y J LLC
- Yakima Federal Savings and Loan
- Yakima Independent Medical Service
- Yakima Pomona Mobile Home Park Inc.
- Yakima Ranches LTD
- Yakima Sunny Acres Estates, LLC
- Yamaha of Ellensburg, Inc.
- Young Orchards
- Zirkle Fruit Company

Utilities

- Benton Rural Electric Association
- Ellensburg Telephone Company, Inc.
- Franklin County PUD No. 1
- Grant County PUD No. 2
- Kittitas County PUD No. 1
- Kittitas Reclamation District
- Midstate Electric Coop, Inc.
- Northwest Pipeline Corporation
- Puget Sound Energy, Inc.
- Transmission Agency of Northern California
- United Telephone Company of Northwest

Interest Groups

- Assemblies of God
- Bethel Gospel Tabernacle
- Catholic Bishop of Yakima
- Catholic Cemetery
- Children's Activity Museum of Ellensburg
- Christian and Missionary Alliance Church
- Church of God
- Church of Jesus Christ

- Church of Jesus Christ of Latter Day Saints
- Church of the Nazarene
- Clymer Foundation
- Coyote Creek Owners Association
- Eagles Lodge No. 2220
- Ecumenical Church of Ellensburg
- Ellensburg Masonic Temple Association
- First Baptist Church
- First Christian Church
- First Lutheran Church of Ellensburg
- First United Methodist Church
- Friends of Earth
- Great Roundup Cowboy Church
- I O O F Lodge 20
- Kamiakin Village Association
- Kittitas County Cattlemen's Association
- Kittitas County Historical Society
- Kittitas Valley Rifle Club
- League of Women Voters
- Lower Columbia Basin Audubon Society
- Loyal Order of Moose
- New Hope Korean Presbyterian Church
- Northwest Energy Coalition
- NRCB Hampton Court Government Management
- Pacific Northwest Association of Church of God
- Parkland Condo Owners Association
- Sierra Club
- SRE-1 Skippers of Ellensburg
- Trail's Edge Homeowners Association
- United Pentecostal Church
- Upper Columbia Corporation of Seventh Day Adventists
- Washington State Jaycees Foundation
- Wheat Grower's Association
- Wilderness Society of Washington
- Willows Condo
- Yakima Jaycees
- Yakima Ranch Owners Association

- Yakima River Alliance
- Yakima Rock and Mineral Club
- Yakima Valley Audubon Society
- Yakima Valley OIC
- Yakima Valley Sportsman Association

Libraries and Schools

- Benton City Library
- Central Washington University
- Eastern Washington University
- Ellensburg School District 401
- Kittitas Public Library
- Richland Public Library
- School District #160, Royal City, WA
- USDOE Reading Room at Washington State University, Tri-Cities
- Washington State University
- Yakima Valley Regional Library

Media

- ECTV
- Ellensburg Daily Record
- KIMA TV
- Mattawa Area News
- Tri City Herald
- Yakima Herald Republic

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Source Data for Maps

Map 1: Bonneville Power Administration Regional GIS Database. Hanford Monument Data provided by Bechtel.

Map 2: Bonneville Power Administration Regional GIS Database. Hanford Monument Data provided by Bechtel. Yakima Training Center boundary from Washington Department of Natural Resources, Major Public Lands, June 2001.

Map 3: Bonneville Power Administration Regional GIS Database. Street Identification from DeLorme Street Atlas 6.0.

Map 4: Bonneville Power Administration Regional GIS Database. Flood Hazard data from Federal Emergency Management Agency, Q3 digital flood data. Watershed boundaries from U.S. Geological Survey.

Map 5: Bonneville Power Administration Regional GIS Database. Washington Department of Natural Resources, Natural Heritage Program GIS data set September 2002. USFWS National Wetlands Inventory.

Map 6: Bonneville Power Administration Regional GIS Database. Parsons Brinkerhoff, Inc. for Fish Bearing Water body identification.

Map 7: Bonneville Power Administration Regional GIS Database. Washington Department of Natural Resources Major Public Lands, POCA data, June 2001. Hanford Site boundaries provided by Bechtel.

Map 8: Bonneville Power Administration Regional GIS Database. Hanford Site Information from US Fish & Wildlife Service.

Map 9: Bonneville Power Administration Regional GIS Database. 30 Meter National Land Cover Data from cooperative project by U.S. Geological Survey and the U.S. Environmental Protection Agency. May 2000.

Map 10: Bonneville Power Administration Regional GIS Database. Visual Information provided by Parsons Brinkerhoff Inc.

Chapter 10 — Glossary and Acronyms

This chapter contains a list of acronyms, abbreviations, and technical terms used in this EIS. Words that would be defined in a desk-size dictionary (for example, the College Edition of the American Heritage Dictionary) are not included.

Acronyms and Abbreviations

Ac	acre
Army Corps	U.S. Army Corps of Engineers
ACEC	Areas of Critical Environmental Concern
ALE	Fitzner-Eberhardt Arid Lands Ecology Reserve
ARPA	Archeological Resources Protection Act
APE	Area of Potential Effect
ATV	all terrain vehicle
BA	Biological Assessment
BIA	Bureau of Indian Affairs
B&O	Business & Occupation Tax
BLM	U.S. Bureau of Land Management
BMP	Best Management Practices
BOR	U.S. Bureau of Reclamation
BPA	Bonneville Power Administration
CCT	Confederated Tribes of the Colville Reservation
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CLUP	Comprehensive Land Use Plan
cm	centimeter
CNRMP	Cultural and Natural Resources Management Plan
CO	carbon monoxide
CO_2	carbon dioxide
COE	U.S. Corps of Engineers
CRP	Federal Conservation Reserve Program
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dBA	decibels (A-weighted)
DDE	(1,1-dichloro-2,2-bis(p-chlorophenyl)ethylene)
DDT	(1,1,1-trichloro-2,2-bis(p-chlorophenyl)ethane)
DEIS	Draft Environmental Impact Statement
DNR	Washington State Department of Natural Resources
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOR	Washington State Department of Revenue
DPS	Distinct Population Segment
EDNA	Environmental Designation for Noise Abatement
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement

EMF	Electric and magnetic fields
EMI	Electromagnetic interference
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FCC	Federal Communications Commission
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIRM	Flood Insurance Rate Maps
FPPA	Farmland Policy Act
ft	feet
GIS	Geographic Information System
GMA	Washington State Growth Management Act
GPS	Global Positioning Systems
ha	hectares
HPA	Hydraulic Project Approval
IPM	integrated pest management
JARPA	Joint Aquatic Resources Permit Application
kHz	kilohertz
kV	kilovolt
kV/m	kilovolt per meter
m	meter
mA	milliampere
mG	milligauss
MOU	Memorandum of Understanding
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NERC	North American Electric Reliability Council
NESC	National Electrical Safety Code
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHRP	National Register of Historic Places
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
NWP	Nationwide Permit
NWR	National Wildlife Refuge
OAHP	Washington State Office of Archaeology and Historic Preservation
ORV	off-road vehicle

PCB	polychlorinated biphenyl
PHS	Priority Habitats and Species
PT	Potential Transformer
RAS	Remedial Action Scheme
RCRA	Resource Conservation and Recovery Act
REA	Rural Electric Association
REO	Real Estate Officer
RI	Radio Interference
RL	Richland Operations Office
ROD	Record of Decision
ROW	Right-of-Way
RMP	Resource Management Plan
RTO	Regional Transmission Organization
RV	Recreational Vehicle
SEPA	Washington State Environmental Policy Act
SGCA	Western Sage Grouse Conservation Agreement
SHPO	Washington State Historic Preservation Officer
SMA	Shoreline Management Act
SPAB	Site Planning Advisory Board
SWPP	Storm Water Pollution Prevention Plan
TCP	Traditional Cultural Property
TNC	The Nature Conservancy
TSCA	Toxic Substances Control Act
TSD	Treatment, storage, and disposal
TVI	Television Interference
USDOA	U.S. Department of Army
USDOE	U.S. Department of Energy
USDOI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geologic Survey
V/m	volts per meter
WAC	Washington Administrative Code
WDOE	Washington Department of Ecology
WDNR	Washington Department of Natural Resources
WNHP	Washington Natural Heritage Program
WDFW	Washington Department of Fish and Wildlife
WSA	Wilderness Study Area
WQL	Water Quality Limited
YTC	Yakima Training Center

TECHNICAL TERMS

Alevin: a recently hatched juvenile fish still residing in the gravel of a stream.

Alluvium: sedimentary material deposited by flowing water as in a delta or riverbed.

Alternating current: an electric current that reverses directions at regular intervals.

Ambient noise: noise levels of the surrounding area.

Anadromous: fish that migrate up rivers from the sea to breed in fresh water.

Anticline/Anticlinal: an arching fold in layered rocks.

Aquifer: a layer of underground sand, gravel, or spongy rock in which water collects.

Aspect: when referring to vegetation, the direction a slope is facing.

Background: over five miles from the viewer

Basalt lithosols: soils with very high rock content.

Bay: an area set aside in a substation for special equipment.

Best Management Practices: a practice or combination of practices that are the most effective and practical means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

Biodiversity: different species of plants and animals in an environment.

Biological crust: groups of living organisms that coat the soil or live just below the soil surface. Some components of biological crusts include algae, blue-green algae, bacteria, lichens, mosses, liverworts, and fungi. These organisms give the soil surface a crunchy texture and a bumpy appearance, making the soil appear darker than soils without crusts. Biological crusts are beneficial because they stabilize soil, prevent wind erosion, increase soil fertility, and inhibit germination, which helps decrease invasion by non-native species.

Blackout: the disconnection of the source of electricity from all electrical loads in a certain geographical area.

Breaker: a switching device that can automatically interrupt power flow on a transmission line at the time of a fault, such as a lightning strike.

Brownout: a partial reduction of electrical voltages that causes lights to dim and motor-driven devices to lose efficiency.

Buffer area: a strip of vegetation surrounding a stream or wetland that provides habitat for wildlife, reduces or traps sediments, and slows runoff velocity.

Buswork: a generic term to describe all equipment associated with the bus tubing. Bus tubing is rigid aluminum pipes used within a substation to move electricity. The tubing is supported and vertically elevated by pedestals called bus pedestals.

Class 1 areas: Section 160 of the federal Clean Air Act requires the preservation, protection, and enhancement of the air quality in national parks, national wilderness areas, national monuments, national seashores, and other areas of special national or regional natural, recreational, scenic or historic value. The 1977 Clean Air Act amendments called for a list of existing areas to be protected under section 160.

Class A Weeds: weeds that have a limited distribution in the state, and state law requires eradication of these species.

Class B Weeds: noxious weeds that are not native to the state and are of limited distribution or are unrecorded in a region of the state and that pose a serious threat to that region.

Class C Weeds: widely established and have interest to the agricultural industry. Some of these weeds are controlled on a local basis, depending on local threats and the feasibility of control.

Clean Water Act (CWA): regulates discharges into waters of the United States. Also known as the federal Water Pollution Control Act.

Colluvium: soil and/or rock fragments moved by creep, slide, local wash and deposited at the base of steep slopes.

Columbia River Basalt Group: composed of the Grand Ronde Basalt and the overlying Wanapuma and Saddle Mountain Basalt. Comprises most of the aquifer system (USGS 1994).

Complex: a specific watershed area within the YTC. The YTC is divided into ten complexes.

Congestion pricing: pricing that works to reduce congestion by allowing generation on the surplus side of the constraint to shut down and purchase replacement power on the deficit side.

Corona: the partial electrical breakdown of the insulating properties of air around the conductors of a transmission line. In a small volume near the surface of the conductors, energy and heat are dissipated. Part of this energy is in the form of small local pressure changes that result in audible noise. Corona-generated audible noise can be characterized as a hissing, crackling sound.

Cultural resources: those historic and archaeological properties, properties of traditional and cultural significance, sacred sites, Native American human remains and associated objects, and cultural landscapes which are entitled to special consideration under federal statute, regulations, and/or executive orders.

Cumulative impacts: impacts created by the incremental effect of a specific action when added to other past, present, or reasonably foreseeable future actions.

Current: the amount of electrical charge flowing through a conductor.

DDE: product of the metabolic breakdown of DDT by an organism.

Dead-end structure: transmission line towers that equalize stresses on the conductors and are made of heavier gauge steel. Normally located at angle points and large spans.

Debitage: the flaking by-products that result from working rough stone into tools.

Dedicated Recreation: recreation activities that are limited to a finite geographic location and are supported by improvements that commit the resource to a specific recreational activity.

Dedicated Recreationalist: those who participate in recreational activities within the study area and are limited to a finite geographic location.

Demographic: information relating to the dynamic balance of a population, especially with regard to density and the capacity for expansion or decline.

Direct Service Industries: This group of high-electricity use manufacturers includes 10 aluminum plants, a chlorine manufacturer, and a couple of smaller metal producers. The DSI's purchase their power directly from BPA, rather than from utilities.

Dispersed Recreation: recreation activities that are not limited to a finite location. These types of activities do not require improvements that commit resources to a particular type of recreation.

Distinct Population Segment (DPS): a portion of a species or subspecies that occurs in a certain area.

Double-circuit: towers that hold conductors for two transmission lines.

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

Electromagnetic interference (EMI): a high-frequency noise caused by corona that can cause radio and television interference.

Emergent wetlands: wetlands dominated by herbaceous plants.

Endemic: a naturally occurring species that is limited to a particular geographic area.

Energization date: when the project has been built and is operational.

Environmental Impact Statement (EIS): a document that discloses the environmental impacts of a proposed action and alternatives.

Ephemeral wetlands: wetlands that are only filled with water for a brief time during the spring.

Evolutionarily Significant Unit (ESU): a set of populations with a distinct evolutionary history.

Excise taxes: internal taxes imposed on the production, sale, or consumption of a commodity or the use of a service.

Executive Order on Environmental Justice (Executive Order 12898): enacted in February 1994 to ensure that federal agencies do not unfairly inflict environmental harm on economically disadvantaged and minority groups within the United States or any of its territories.

Extirpated: no longer existing or living in a given geographic area.

Federal actions: can include projects that receive federal funding or require a federal permit.

Federal species of concern: species that may be rare or declining, but are not formally listed under the Endangered Species Act.

Federally listed, proposed, or candidate species: species designated or in the process of being designated under the Endangered Species Act as endangered or threatened.

Floodplain: areas that have a one-percent chance of being flooded in a given year are designated as 100-year floodplains.

Flyway: a path of migration for many different species of birds.

Forage: food for domestic animals, e.g., cattle, sheep, etc.

Forbs: any herb other than grass.

Foreground: within 0.25 to 0.5 miles of the viewer

Forested wetlands: wetlands with a tree canopy.

Full-bench road construction: cutting into the hillside to accommodate the whole road prism.

Gauss: a unit of magnetic induction.

Greenhouse gases: gases contributing to global warming. Greenhouse gases include: water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ground level ozone (and the pollutants which generate ground level ozone), and stratospheric ozone depleting substances such as chlorofluorocarbons and carbon tetrafluoride. CO_2 is the most common greenhouse gas in the atmosphere. Greenhouse gases warm the atmosphere by absorbing infrared radiation given off by the earth, preventing heat loss to outer space.

Gully erosion: rapid erosion, usually in brief time periods, that creates a narrow channel which may exceed 100 feet in depth.

Harm: defined by the U.S. Fish and Wildlife Service as including significant habitat modification or degradation resulting in death or injury by significantly impairing behavioral patterns to the extent that normal behavior patterns (e.g., breeding, feeding, and sheltering) are disrupted.

Headwater: the source of the river.

High quality plant community: areas of native vegetation with little or no disturbance or exotic species.

High quality terrestrial ecosystem: an area must be dominated by native species, with little to no disturbance to vegetation, and have high ecological value, both in condition and viability, the ability to persist on a site.

High Visual Sensitivity: residential viewers who own property within 500 feet of the proposed corridors and are concerned about transmission structures and how they impact the view of the natural environment.

Incised: rivers that have carved a path through the bedrock of an area.

Intermittent stream: water flows only seasonally.

Interstitial spaces: spaces or openings in substrates that provide cover and habitat for bottom-dwelling plants and animals.

In-water work windows: times of year, determined by WDFW, when instream work is least likely to harm listed species.

Kilovolt (kV): one thousand volts.

kV/m: kilovolt per meter

Lacustrine: pertaining to lakes, wetlands or any standing water body with a total surface area exceeding 20 acres.

Large woody debris recruitment potential: the potential for large trees to fall into the stream and provide fish habitat.

Lek: an open area where sage grouse gather in the spring to perform courtship dances.

Lithic: relating to stones.

Lithosols: rocky soils that usually develop in areas underlain by basalt.

Location pricing: a method of establishing prices that is discriminatory with respect to location and the characteristics of a location (e.g., greater demand).

Loess: a windblown deposit of fine-grained silt or clay.

Long-term socioeconomic impacts: the value of any agricultural crops taken out of production, interference with agricultural practices, reductions in the taxable land base, and the perceived effects on property values from new transmission and substation facilities.

Low Visual Sensitivity: most motorists who will only see the proposed transmission lines at limited locations from the roads that they are traversing.

Megawatt (MW): a unit of electrical power equal to 1 million watts.

Middleground: from the foreground to about five miles from the viewer

Milliampere (mA): one thousandth of an ampere, a measure of electric current

Milligauss (MG): one thousandth of a gauss.

Miocene: a period in the Neogene lasting from 23 million years ago to 5 million years ago.

Mitigation: describes measures that could be taken to lessen the impacts predicted for each resource. These measures may include reducing or minimizing a specific impact, avoiding it completely, or rectifying or compensating for the impact.

Moderate Visual Sensitivity: some recreationalists, such as some bird watchers, some hikers and/or those whose recreational activity is specific to a finite geographic location, who are sensitive to man-made structures and how they impact the view of the natural environment.

Monoculture: the cultivation or growth of a single crop or organism, especially on agricultural or forest land.

Motorists: those traveling by automobile on an Interstate, State or local road within the study area.

Native American traditional cultural practices: can include gathering plants and roots for medicinal use and religious ceremonies.

Neogene: the geological period lasting from 23 million years ago to present day.

Neotropical: the biogeographic region that extends south, east, and west from the central plateau of Mexico.

Non-anadromous: fish that do not migrate to the sea and back during their life cycle.

Nonattainment area: a geographic region designated by EPA in which federal air quality standards are not or were not met by a certain date. There are six air pollutants that are monitored; particulate matter (PM), carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb).

North of Hanford: a designated area on the BPA transmission system, north of the Hanford Substation, that is used in transmission system studies.

Notice of Intent: for this project was included in the Federal Register (65 FR 77352). This publication publishes regulations and legal notices issued by federal agencies.

Noxious weeds: particularly troublesome weeds designated by Washington State law. The list of noxious weed species is divided into three classes (A, B, and C) within each county, based on the state of invasion.

Outage: a transmission line that is not in service, either planned or unplanned.

PCB: a family of industrial chemical compounds, noted as an environmental pollutant that accumulates in animal tissue.

Pacific Flyway: The path of migration for many different species of birds.

perennial stream: flows throughout the year.

Physiography: the study of the structure and phenomena of the earth's surface.

Plant communities (also known as plant associations): assemblages of species that grow together in similar habitats and are found repeated across the landscape.

PM-10: particulate matter having a nominal aerodynamic diameter less than or equal to 10 microns.

Potential transformer (PT): a type of transformer that uses low-voltage to monitor the high-voltage system. The low-voltage output of this transformer is used for relaying and metering.

Power Circuit Breaks: a breaker is a switch device that can interrupt a circuit in a power system during overload or fault conditions.

Prime Farmland: land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, livestock, timber, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and/or labor. It does not include land already in or committed to urban development or water storage. (USDA, NRCS web page)

Proposed RTO West: a proposed future Regional Transmission Organization.

Reconductor: take the existing conductors off of the towers and replace them with new conductors.

Regime: refers to the pattern and direction of the flow of the river.

Regional power transfers: within this EIS, this refers to the exchange of electricity between the Pacific Northwest and California or Canada. The transfer occurs when one region has a surplus of energy and demand is high in another. Typically, the Pacific Northwest transfers power to California during the summer when their demand is highest.

Regional Transmission Organization (RTO): an organization comprised of public and private entities that coordinates the sales and purchases of electricity.

Residents: those whose primary residence is located within the study area.

Residuum: unconsolidated weathered mineral material that accumulated as consolidated rock and disintegrated in place.

Rill erosion: mild water erosion, caused by overland flow, producing very small and numerous channels.

Riparian: areas of land that occur along watercourses and water bodies. Typical examples include floodplains and streambanks. They are distinctly different from surrounding lands because of unique soil and vegetation characteristics that are strongly influenced by the presence of water.

Rock Hounder: recreationalist in search of rocks, including petrified wood.

Salmonid: belonging to the family Salmonidea, including salmon, trout, and whitefish.

Scree: a loose rock slope, similar to a tallus slope.

Scrub-shrub wetlands: wetlands dominated by shrubby plants.

Section 303(d): under this section of the Federal Clean Water Act, certain streams are listed that do not meet current water quality standards.

Section 404: Section 404 of the Federal Clean Water Act regulates the discharge of solid materials, including building materials, into US waters.

Section 404 Removal/Fill permit: federal permit issued by the U.S. Army Corps of Engineers that regulates wetland areas.

Sedge: any number of grasslike plants of the family Cyperaceae, having solid stems and leaves in three vertical rows.

Sediment deposition: sediment deposited on a streambank or streambed.

Sediment load: the amount of sediment moved by stream

Short-term socioeconomic impacts: those created by an influx of construction workers into a local area and the additional tax monies generated.

Shrub-steppe: habitat is a shrub and grass dominated community found in arid areas.

Single-circuit: towers that hold conductors for one transmission line.

Snag: a dead tree.

Southern Intertie: a collective group of transmission lines that move power north and south between Oregon and California.

Spilling: when dam gates are opened and water flows out. The water does not go through the turbines, which would injure fish.

Spring run-off: water from the snow melting in the spring adds to the amount of water flowing in the Columbia River.

Spur road: short road segments branching off the trunk roads that go to each structure if the structure is not located on a trunk road.

Steppe: habitat is a grass-dominated community found in arid areas.

Sub soiling: plowing or turning up the layer of soil beneath the topsoil.

Substation Dead-ends: structures within the confines of the substation where incoming and outgoing transmission lines end. Dead-ends are typically the tallest structures in a substation.

Suspension structure: transmission line towers that are used to elevate wires a safe distance above the ground on relatively straight stretches of a line without sharp angles.

Switches: devices used to mechanically disconnect or isolate equipment; found on both sides of circuit breakers.

System reliability: the ability of a power system to provide uninterrupted service, even while that system is under stress.

Tailrace: the part of the millrace below the turbine through which the spent water flows.

Take: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct.

Talus Slope: slope with numerous loosely aggregated rocks.

Time-of-use rates: rates that are discriminatory with respect to time of use (e.g., higher rates for peak use times).

Traditional cultural property (TCP): one that is eligible for inclusion in the NRHP because of its association with cultural practices or beliefs (e.g., traditions, beliefs, practices, lifeways, arts, crafts, and social institutions) of a living community that are rooted in that community's history, and are important in maintaining the continuing cultural identity of the community.

Transmission capacity: the maximum load that a transmission line or network of transmission lines can carry under existing conditions.

Transmission line dead-end: the last transmission line structure on both the incoming and outgoing sides of the substation are called dead-end structures. These structures are built with extra strength to reduce conductor tension on substation dead-ends and provide additional reliability to the substation. Dead-end structures use more insulators and heavier steel than the other kind of structure, which makes them more visible. Dead-end structures also are more expensive than suspension structures.

Turbidity: a reduction in the clarity of water from suspended materials such as clay, mud, organic material, or other materials.

Viewshed: the area that is visible within the topographic horizon from a particular location.

Vision quest: a ceremonial rite for people seeking spiritual guidance; also a rite of passage for young men.

Visual resources: the physical features that make up the visible landscape, including land, water, vegetative, and man-made elements (Guidance Material, USDOT, undated).

Wasteway: a drainage carrying irrigation return flow.

Waterbar: smooth, shallow ditches excavated at an angle across a road to decrease water velocity and divert water off and away from the road surface.

Water quality limited: under Section 303(d) of the Federal Clean Water Act refers to streams that do not meet current water quality standards.

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NOTE: This index has been updated for the FEIS.