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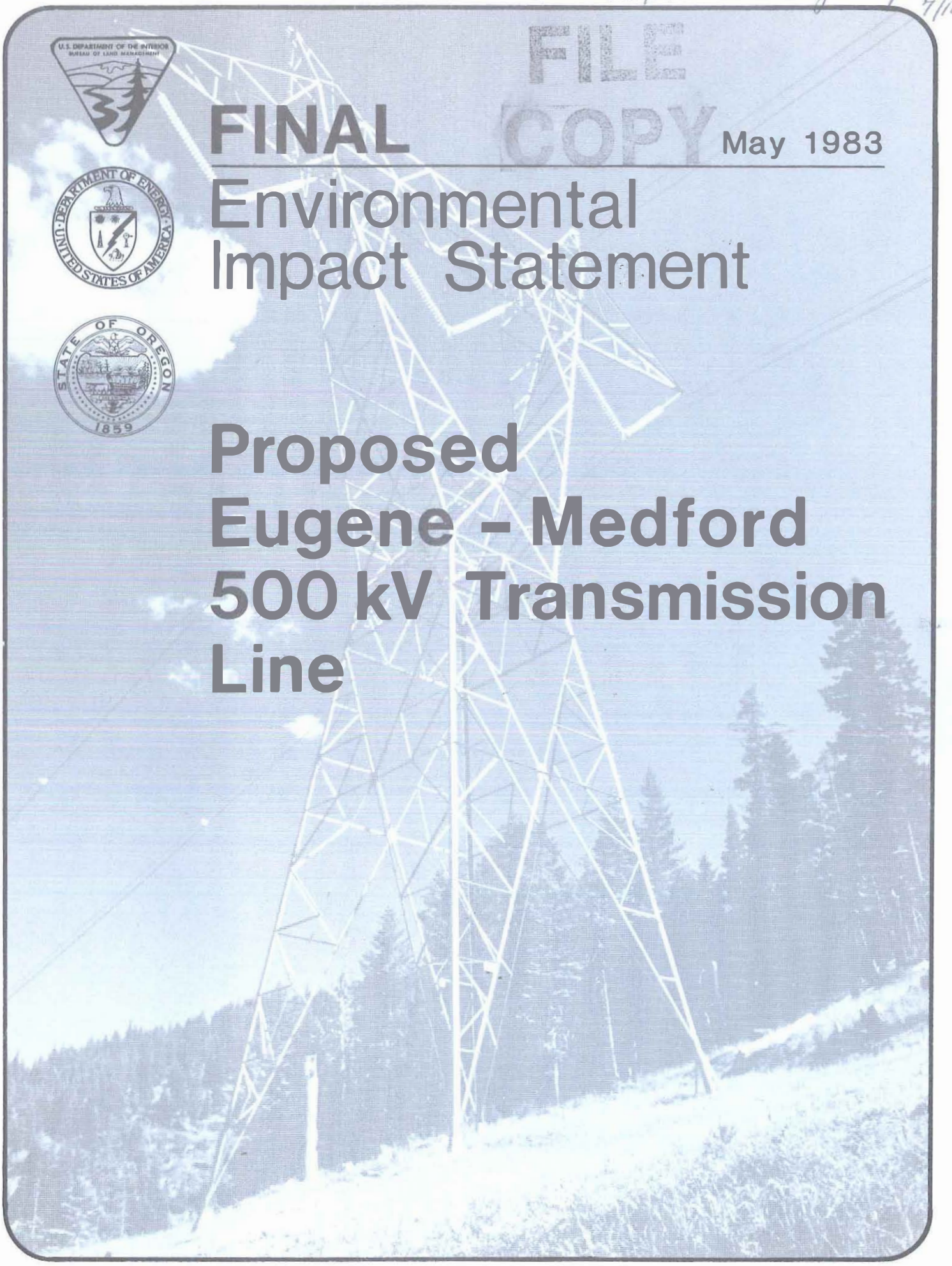
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FINAL

May 1983

Environmental Impact Statement

Proposed Eugene - Medford 500 kV Transmission Line



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

United States Department of Energy

BONNEVILLE POWER ADMINISTRATION

State of Oregon

DEPARTMENT OF ENERGY

IN REPLY REFER TO

1792 PP&L (935)

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

OREGON STATE OFFICE
P.O. Box 2965 (825 NE Multnomah Street)
Portland, Oregon 97208

This final environmental impact statement (FEIS) addresses a proposed 500 kilovolt electrical transmission line linking Eugene and Medford, Oregon. Preparation of this statement is a step in the process leading to decisions from the responsible federal agencies on requested authorization of the project. The statement analyzes impacts which would result from the proposed action, four alternatives, and 14 routing or construction options. Its purpose is to disclose probable effects on the natural, social and economic environment for consideration in the decisionmaking process. In using this analysis, readers should keep in mind that a FEIS is not a decision document. Final decisions by the Bureau of Land Management and the Bonneville Power Administration will come later and will be announced in Records of Decision.

Underlined material, except for headings and scientific names for species, represents revisions to original DEIS text. Since a new preferred alternative has been identified in this FEIS, a 60-day comment period is established. Comments will be accepted until July 15, 1983. Written comments on the FEIS may be addressed to:

Bureau of Land Management
Planning and Environmental Coordination Staff (935)
P.O. Box 2965
Portland, Oregon 97208

All comments, written and oral, on the Draft and Final EISs will be considered prior to preparation of the Federal Records of Decision. Attached is a brief explanation of the role of the agencies involved with the analysis.

William L. Leavell

Oregon State Director
Bureau of Land Management

Enclosure 1
Agency Roles

Agency Roles in the Eugene to Medford 500 kV Transmission Line

The proponent of this line, Pacific Power and Light Company, has applied for basic rights-of-way across public lands administered by the Bureau of Land Management (approximately 15 percent of the proposed project). BLM was designated as lead agency for the preparation of an environmental impact statement.

Under provision of Oregon law PP&L has acquired a Site Certificate from the Oregon Energy Facility Siting Council (EFSC) which has State jurisdiction for projects of this nature. The Oregon Department of Energy is a cooperating agency for the EIS.

Bonneville Power Administration (BPA) would provide 500 kV service to the proposed line and became a cooperating agency for the EIS at the outset. If the new preferred location is selected, BPA would build the initial 2 miles of the project between their Alvey Substation east of Eugene and the Spencer Switching Station.

These three government agencies entered into a memorandum of understanding on how to carry out the environmental analysis. Under terms of that memorandum Envirosphere Company was selected to prepare this EIS and other supporting documentation on behalf of BLM. Routing studies in the Eugene and Medford areas and technical investigation of the existing transmission corridor between the study areas were completed before preparation of the Draft EIS. Copies of the Routing Study and Technical Investigation Reports are available for review in local libraries throughout the project area; PP&L offices; BLM offices in Medford, Roseburg and Eugene; and the BPA office in Eugene.

DEPARTMENT OF THE INTERIOR

FINAL

ENVIRONMENTAL IMPACT STATEMENT

EUGENE-MEDFORD 500 KV TRANSMISSION LINE

FES 83-23

Prepared by
ENVIROSPHERE COMPANY
For the
BUREAU OF LAND MANAGEMENT

OREGON STATE OFFICE

State Director, Bureau of Land Management

Director, Oregon Department of Energy
Cooperating Agency

April, 1983

EUGENE-MEDFORD 500 KV TRANSMISSION LINE

Environmental Impact Statement

Draft ( ) Final (x)

Lead Agency: U.S. Department of the Interior, Bureau of Land Management

Cooperating Agencies: U.S. Department of Energy, Bonneville Power Administration and State of Oregon Department of Energy

State and Counties Involved: State of Oregon, Lane, Douglas, and Jackson Counties

1. Type of Action: Administrative

2. Abstract: Pacific Power and Light Company and BPA propose to build a 135.2 mile 500 kV transmission line from Eugene to Medford based on a need to reliably serve growing electrical loads in southern Oregon and northern California. BPA would build 2 miles of the line from Alvey Substation (southeast of Eugene) to Spencer Switching Station (south of Eugene), parallel to an existing line. Pacific would build 133.2 miles of the line, replacing existing 230 kV lines over most of this distance, except for 11.1 miles of new alignment between Dixonville and Ramsey Canyon and short segments of parallel construction in the Medford area. This proposal is the agency "preferred alternative" in this FEIS, and supercedes the preferred alternative identified in the DEIS. For clarity, the former is termed the new preferred alternative, as opposed to the draft preferred alternative. The draft preferred alternative differs from this proposal primarily in regard to the northern and southern terminal segments, as it would involve construction of a line to Lane Substation west of Eugene and a new corridor in the Medford area. Other alternatives include no action, and constructing either a parallel or double circuit line. The no action alternative affects social and economic conditions by not reliably meeting future electricity requirements. The parallel line would affect all resources to a greater extent than the preferred alternative. The double circuit alternative would have impacts similar to the preferred one, except for lesser long-term impacts of the double circuit option because it would eliminate the need to build a parallel line in the future. In addition, thirteen options applicable to several alternatives are analyzed. One of three options for the Eugene area is recommended, substituting a link to Alvey Substation (Option C) for the original tie to Lane Substation. In the Medford Basin, the draft preferred alternative would circle the Medford Basin on the north and east and would cross the Rogue River approximately 2 miles south of Shady Cove. The west route options, Options H and K, would avoid Sams Valley but pass through White City, while the existing corridor options, Options I and L, would pass through Sams Valley and White City. Impacts for the options which follow portions of existing corridors (H, I, L and M) would be primarily related to visual and land use, while the draft preferred alternative within the Medford Basin would involve a new corridor and impacts to all resource categories. Option I was therefore incorporated into the new preferred alternative. Options K, L, and M allow for future transmission line expansion. The new preferred alternative also includes a modified version of Option G in the vicinity of West Fork Evans Creek.

3. Alternatives Analyzed:
   a. Pacific Power and Light Company and BPA Proposal, Draft Preferred Alternative
   b. No Action, Alternative 1
   c. Parallel Alternative, Alternative 2
   d. Double Circuit Alternative, Alternative 3
   e. Thirteen options within these alternatives
   f. New Preferred Alternative, Alternative 4

4. The Draft EIS was issued in May 1982. The final statement will be made available to EPA and the public in May 1983. The comment period will be 60 days beginning after the final EIS is filed with the Environmental Protection Agency and the Notice of Availability is published in the Federal Register. This notice is anticipated in May 1983.

5. For further information contact:

Mr. Philip C. Hamilton
Bureau of Land Management
Oregon State Office
P.O. Box 2965 (825 N.E. Multnomah St.)
Portland, Oregon 97208
Telephone: (503) 231-6256

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SUMMARY

SUMMARY

PURPOSE

This Final Environmental Impact Statement (FEIS) describes and analyzes the environmental impacts of a proposed 500 kV transmission line from Eugene to Medford, Oregon. The project is being proposed by Pacific Power and Light Company (Pacific) to reliably serve anticipated electric loads in Pacific's southern Oregon and northern California service area. An additional project purpose identified by the Bonneville Power Administration (BPA) is to satisfy a future requirement to upgrade service in the Eugene area.

ALTERNATIVES

The objective of the construction alternatives would be to connect Meridian Substation east of Medford with either Lane or Alvey Substation near Eugene. The first alternative accomplishing this objective is termed the draft preferred alternative, as identified by the Bureau of Land Management (BLM) of the U.S. Department of the Interior (the lead government agency for environmental analysis on the project) and the other cooperating agencies in the Draft Environmental Impact Statement (DEIS). The draft preferred alternative determined the project configuration proposed by Pacific in its Site Certificate Application to the State of Oregon Energy Facility Siting Council (EFSC). The draft preferred alternative reflects input received from BPA concerning the portion of the line it would construct. Three alternatives to this proposal, including a no action alternative, are also analyzed in the EIS. A fourth alternative, incorporating three routing options into the draft preferred alternative, was identified during the DEIS review and State of Oregon site certification process and is described subsequently. This fourth alternative is referred to as the new preferred alternative in this FEIS.

The draft preferred alternative would consist of 146.8 miles of 500 kV transmission line between Lane and Meridian Substations. The precise configuration of the proposed line, in terms of structure type, right-of-way requirements and other design factors, varies considerably along the route. Most of the line would be carried on single circuit steel lattice towers, although double circuit lattice towers would be used for some segments. Existing lower voltage lines would be replaced along 98.9 miles or two-thirds of the route, 7.5 miles would be parallel construction, and 40.4 miles of new corridor would be developed. Circuit breakers and other equipment would be added at the existing Lane, Dixonville and Meridian Substations, but no new substations would be needed to accommodate the proposed line.

BPA would construct 11.5 miles of line within or parallel to its existing corridor from Lane Substation to Spencer Switching Station in the Eugene area. Pacific's portion of the draft preferred alternative would consist primarily of replacing 94.9 miles of an existing 230 kV

line from Spencer to Ramsey Canyon, interspersed with new corridor segments totalling 13.4 miles located near Canyonville, Green Mountain, and Evans Creek. The remaining 27 miles from Ramsey Canyon to Meridian Substation would be new corridor along the northern and eastern fringe of the Medford Basin.

The northern portion of the line from Lane to Dixonville would be built during 1985, while the Dixonville-Meridian portion would be built during 1987 and 1988. Due to the partial or complete use of existing right-of-way in various areas, requirements for additional right-of-way for the preferred alternative range from 0 to 175 feet. The overall estimated requirements for the construction alternatives, including the fourth or new preferred alternative identified by the Oregon Energy Facility Siting Council (EFSC), are shown in Summary Table 1.

SUMMARY TABLE 1

PROJECT ALTERNATIVE REQUIREMENTS

Requirement	Draft Preferred Alternative	Parallel Alternative 2	Double Circuit Alternative 3	**New Preferred Alternative Alternative 4**
Corridor length (miles)	146.8	146.8	146.8	**135.2**
New right-of-way (acres)	1,323	2,543	1,323	**936.5**
New access roads (miles)	118.0	129.6	118.0	**52.6**
Cost ($ million)	69.2	74.6	121.6	**60.7**

Alternative 1, the no action alternative, which is not shown in Summary Table 1, assumes that no steps would be taken to meet the anticipated load growth in southern Oregon and northern California.

Alternatives 2 and 3 involve different design configurations. Both alternatives would follow the same alignment as the draft preferred alternative from Lane Substation to Meridian Substation, and both would retain the same division of ownership and construction responsibility between Pacific and BPA. Alternative 2 would involve construction of a parallel 500 kV circuit for 94.9 miles along the east side of Pacific's existing corridor from Spencer Switching Station to Ramsey Canyon; the parallel mileage corresponds to the replacement portions of the draft preferred alternative, leaving these two alternatives identical in the realignment and new corridor segments. Along the parallel segments, the existing corridor would have to be widened by 125 feet in some areas and 137.5 feet in others.

The distinguishing feature of Alternative 3 would be the use of double circuit steel lattice towers for the entire route from Lane to Meridian. These towers would be capable of supporting two 3-phase sets of conductors, and are larger and more costly than single circuit towers. Only one circuit would be strung initially, allowing for a second 500 kV line to be added in the future with no new right-of-way. The double circuit alternative would duplicate the draft preferred alternative in that it would be constructed primarily through replacement of an existing line. Consequently, the right-of-way and access road requirements would be identical, although Alternative 2 would have a higher cost.

Alternative 4 is identical to the draft preferred alternative along most of the route, but it incorporates routing options (Options C, I, and modified Option G described below). This alternative would involve construction of a short segment of new line from Spencer Switching Station to Alvey Substation near Eugene, and development along the existing corridor from Ramsey Canyon to Meridian Substation in the Medford area. The Spencer-Ramsey Canyon portion of this alternative would be the same as the draft preferred alternative, except for the adoption of modified Option G. Alternative 4 would be approximately 12 miles shorter than the other alternatives, would require less new right-of-way and access road construction, and would be the least costly of the construction alternatives. Given these positive attributes, Alternative 4 has been termed the new preferred alternative. Alternative 4 is also the project configuration for which Pacific has received a site certificate from the Oregon EFSC.

Thirteen options, representing substitute designs and routings for portions of the Eugene-Medford alternatives, have also been identified and evaluated in this EIS. Their estimated requirements are presented in Summary Table 2. Options A, B, and C would involve different alignments and configurations for the northern portion of the line, and generally reflect means of reducing the effect on urban and suburban development near Eugene. These options range from 2 miles to 14.2 miles in length, and would have varying effects on total project length, cost, and right-of-way requirements. Option D would be a 5.1-mile reroute away from the visually sensitive North Umpqua Highway north of Dixonville, and is very similar in length and cost to the corresponding section of the preferred alternative.

Eight of the remaining options would provide for use of portions of the existing corridor between Canyonville and Meridian Substation and would thereby avoid the increased environmental impacts associated with opening a new transmission corridor. Options E, F, and G would consist of existing corridor substitutes for the combined 13.4 miles of new alignment near Canyonville, Green Mountain, and Evans Creek. Modified Option G would involve a combination of existing and new corridor segments in the Evans Creek area. These options would be longer and more expensive than the corresponding portions of the draft preferred alternative, but would require less new right-of-way and access road construction.

SUMMARY TABLE 2

PROJECT OPTION REQUIREMENTS

	Corridor Length (Miles)	New Right-of-way (Acres)	New Access (Miles)	Cost (Dollars)
Option A (Lane-115 kV)	7.5	0.0	0.9	6,900,000
Corresponding Portion of **Draft** Preferred Alternative	7.5	113.6	1.6	7,300,000
Option B (Lane-Camas Swale)	14.2	258.8	18.3	11,930,000
Corresponding Portion of **Draft** Preferred Alternative	16.3	136.6	3.0	13,924,000
Option C (Alvey-Spencer)[1]	2.0	30.3	0.6	3,010,000
Corresponding Portion of **Draft** Preferred Alternative	11.5	113.6	2.3	11,900,000
Option D (Umpqua Hwy Bypass)	5.1	95.5	2.5	2,434,000
Corresponding Portion of **Draft** Preferred Alternative	5.1	0.0	0.6	1,970,000
Option E (Canyonville Existing)	4.2	38.2	0.8	2,323,000
Corresponding Portion of **Draft** Preferred Alternative	2.7	57.3	8.1	1,402,000
Option F (Green Mtn Existing)	7.9	71.8	1.5	3,579,000
Corresponding Portion of **Draft** Preferred Alternative	6.9	146.4	20.7	3,127,000
Option G (W.F. Evans Ck Existing)	4.5	40.9	0.7	2,158,000
Corresponding Portion of **Draft** Preferred Alternative	3.8	80.6	10.1	1,999,000
Modified Option G[1]	**4.5**	**59.1**	**5.0**	**2,080,000**
Medford Basin Options[2]				
Option H (West Route)	30.4	502.6	36.3	16,062,000
Option I (Existing Corridor)[2]	28.5	376.4	15.2	15,270,000
Option K (**Draft** Preferred, Ultimate)	31.3	1132.1	73.8	15,636,000
Option L (West, Ultimate)	30.4	737.5	33.6	22,582,000
Option M (Existing, Ultimate)	28.5	489.0	15.6	21,159,000
Corresponding Portion of **Draft** Preferred Alternative	31.3	657.8	73.8	14,906,000

[1] Included as part of New Preferred Alternative

[2] Originating at West Fork Evans Creek. Option J, Underwater Crossing, is not included in this comparison as its requirements are not readily comparable for the parameters in this table.

Options H and L, the Medford Basin west routes, would combine 10.9 miles of new corridor with 19.5 miles of existing corridor to provide an alternate path to Meridian Substation. Option H would involve building only one line at present while not acquiring easements for future transmission lines in this corridor. Option L would involve acquiring an easement for two lines from West Fork Evans Creek to the junction with the existing line near Lyman Mountain and constructing a double circuit line to maximize future use of the existing corridor through White City. Options I and M also provide an alternative to the draft preferred route through the Medford Basin. These options would follow existing corridors for their entire length and would pass through Sams Valley and White City. Option I would involve building only one line, while Option K would involve constructing a double circuit line and acquiring additional rights-of-way now to fully utilize corridors in the future. All four of these options would require less new right-of-way than the draft preferred alternative, although Options L and M would be substantially more expensive. Option K also considers long-term transmission needs as it would involve the acquisition of additional right-of-way now along the east (agency draft preferred) route to accomodate a future 500 kV transmission line. Option J represents an underground crossing of the Rogue River near Medford along either the proposed or the existing corridor. It would reduce the project's right-of-way and access road requirements somewhat, but would add several million dollars to total project cost.

AFFECTED ENVIRONMENT

The physical setting of the project area consists primarily of rural interior valleys, foothills, and low mountains. Local relief is greatest from near Canyonville to Ramsey Canyon, with generally rolling terrain north of Canyonville. Major drainage basins within the project area include those of the Willamette (Coast Fork), Umpqua, and Rogue Rivers. The most prevalent vegetation type along the Eugene-Medford corridor is forest dominated by Douglas fir, although vegetation communities featuring oak, mixed oak and conifer, grasslands, ponderosa pine, and shrubs are also extensive along various parts of the alternate routes. Wildlife is varied and abundant, with major species of interest including black-tailed deer, Columbian white-tailed deer, bald eagle, osprey, spotted owl, waterfowl, and salmon and trout.

The dominant aspect of the settlement pattern in the project area is the concentration of urban development near Eugene and Medford and along Interstate 5. The proposed route would generally be located east of and parallel to this freeway corridor, through open agricultural and forest land. Urban and suburban development occurs in the Eugene area and in the Medford Basin. Farms, woodlands, and rural residences are the most common land uses in the northern portion of the route, giving way first to ranching and then forestry further south. Farms and homes are generally confined to the larger stream valleys along most of the route, with very few residences in the forested areas. Project alternatives would be located near several local recreation sites, while some dispersed recreation activities occur in the project area. Visual character and sensitivity along the route vary with the level of development, physical features, and degree of human use.

COMPARISON OF ALTERNATIVES

All of the alternatives, except the no action alternative, would satisfy the need of this project. If a future requirement developed for a second 500 kV line in this corridor, this requirement could be met by the parallel or double circuit alternative and the ultimate development options (Options K, L, and M) in the Medford Basin.

The uncertainty of future load levels and characteristics make it difficult to identify and predict the social, economic, and transmission system effects of the no action alternative. These effects would at least consist of increased potential for forced outages in the mid 1980s and beyond and could include restriction of economic growth in the area.

Environmental Comparison

The environmental consequences of the project essentially revolve around the right-of-way and access road requirements identified in Summary Tables 1 and 2. Physical and biological impacts of the action would include soil erosion, sedimentation, forest and riparian vegetation clearing, and various types and degrees of disturbances affecting local wildlife. All of these effects are related to the magnitude of surface disturbance during construction (and to some extent during operation), and tend to increase with the amount of clearing and access road construction. The levels of some social and economic impacts are also directly tied to the physical requirements of the transmission line, particularly concerning interference with agriculture and the removal of forest land from production. Other social impacts depend on the proximity of people to the line or, in the case of the no action alternative, would be felt by persons who consume electricity in southern Oregon and northern California. A narrative comparison of significant impact areas is provided below with more detailed information appearing in Chapters 1 and 3.

A separate assessment of Alternative 4, the new preferred alternative, is not provided throughout the EIS because this alternative incorporates elements of the draft preferred alternative plus Options C, I and modified Option G, all of which are analyzed in this document. Summary impact information for Alternative 4 is presented in Chapter 1, to provide an overall comparison of impacts for all alternatives. In other respects, assessment of the relative impacts of Alternative 4 is best facilitated by analyzing the impacts of Option C and I, and comparing these to the impacts of the corresponding portions of the draft preferred alternative; Option G and modified Option G are very similar in configuration, and differ very slightly in the basic impact variables.

Physical Sciences

Significant impacts associated with the physical environment (air and water resources, soils, and geology) would be limited to increased erosion and sedimentation in the area of West Fork Evans Creek. New and upgraded access road construction and tower site work would be the

primary cause of increased erosion and sedimentation in this area. The highly erodible granitic soils near West Fork Evans Creek make erosion difficult to control, although practices required by BLM and the State of Oregon would limit impacts. It is, nevertheless, uncertain that impacts in this area would be reduced to a level of insignificance.

Biological Sciences

Construction of the draft preferred alternative, Alternatives 2 or 3, or Option K would have moderately significant wildlife impacts along the new corridor segment in the Medford area. The loss of habitat caused by access road and other construction activities as well as the increased disturbance by human activity which would likely occur during and after construction would reduce the quality of wildlife habitat in those presently remote areas north and east of Medford. Impacts due to new access road construction in new alignment portions of Options H and L are not expected to be significant due to the steepness of the area, which inhibits human access, and the lower amount of new access road construction relative to the draft preferred alternative. Of the routes under consideration in the Medford area, the route of Options I (part of the new preferred alternative) and M would minimize wildlife impacts resulting from access road construction.

Impacts to salmonids might be moderately significant in the West Fork Evans Creek drainage due to sedimentation problems resulting from unstable soils for all construction alternatives. Alternative 2 would have the greatest potential for signficant impacts in this area. None of the options would modify the potential for impacts.

SOCIAL SCIENCES

Impacts on the social environment are broad, and in some instances, significant. Significant impacts occur in the areas of visual resources, recreation, and land use.

Recreation

Impacts of the project alternatives and options on recreation would be insignificant in most cases, but would be significant at a few specific sites. The recreation impacts of the proposed line would be limited to changes in the character of views from these sites that would detract from the quality of the recreation experience. Designated recreation sites along the draft preferred alternative include proposed sections of the Ridgeline Trail in South Eugene and Takelma Park near the Rogue River Crossing; impacts on both would be significant. In the case of Options H, I, L, and M in the Medford Basin, the existing corridor passes through Hoover Ponds and Jackson County Sports Park. Impacts on the former would not be significant if the park remains undeveloped, but could increase if the park is developed for passive uses such as nature trails and views. However, this appears unlikely. The intensive recreation activity at Jackson County Sports Park would not be affected by visual changes introduced by a transmission facility. Alternative 4 would therefore avoid the impacts to the Ridgeline Trail and Takelma Park, at the expense of unlikely future impacts to Hoover Ponds.

Adverse effects on dispersed recreation would be significant at the North Umpqua Highway. These impacts could be avoided and the visual impacts of the existing transmission lines could be rehabilitated to a large extent by rerouting the line down a side valley (Option D).

The impact on dispersed recreation along the Rogue River would be significant at the draft preferred alternative crossing, just north of Takelma Park. Options H, I, K, and L would not cause significant incremental impacts at the existing Rogue River crossing. The underground option, J, would have significant impacts on recreation during construction, but would reduce long-term visual impacts to a minimum.

Visual Resources

All of the alternatives, with the exception of the no action alternative, would have significant visual impacts. The parallel alternative would have greater impacts than either configuration of the preferred alternative, due to increased clearing and the retention of existing lines. The double circuit alternative would cause greater visual impacts than single circuit construction, particularly in the short term. The draft preferred alternative would cause high visual impacts in two areas. The parallel alternative would cause high visual impacts in three areas, while the double circuit alternative would cause high visual impacts in four areas. This number could be reduced or increased with the adoption of various options. Through incorporation of Options C and I, the new preferred alternative avoids all of these areas of high visual impact.

Options B and C would avoid the high impact segment of the Twin Oaks-Spencer section of the draft preferred alternative, although Option B would create significant impacts by opening a new corridor between Lane and Camas Swale. Option D, the North Umpqua Highway Bypass, would help to rehabilitate the adverse visual effects of the existing corridor along this designated scenic highway, thereby eliminating a significant impact site. Option E would have a significant impact on the I-5 corridor.

In the Medford Basin, the visual impact comparison of the draft preferred alternative and Option K to Options H, I, L, and M involves a tradeoff between viewer exposure and visual contrast with existing conditions. Options H, I, L, and M would be visible to many more people than the draft preferred alternative, but would not cause signficant contrast with existing visual resources or significant change in scenic quality, except in the Lower Table Rock area. Therefore, impacts would be categorized as moderately significant for these options. For the draft preferred alternative and Option K, which involve opening a new corridor, visual impacts are rated as high.

Land Use

The draft preferred alternative would have no effect on commercial and industrial uses because it would not cross areas used for these purposes. The existing corridor in the Medford Basin crosses an area

of commercial and light industrial development in White City. Options H and I would have no effect on this development because they could be accommodated within the existing right-of-way. Options L and M would require more right-of-way and result in a significant land use impact. However, these options would establish a corridor in the Medford Basin that would accommodate future transmission development and would thus reduce the potential for significant land use conflicts later.

The primary effects of the draft preferred alternative on residential land use would be the decrease in visual amenity now associated with a number of residential areas that the proposed line would cross. These adverse effects would be significant in the South Eugene area, where a large number of residences occur near the existing corridor, and in the Medford Basin, where a new route would be opened through terrain which is sparsely populated now but which appears likely to be developed for rural residential use. Alternatives 2 and 3 would cause a significant increment of visual impact at other residential concentrations, including Lynx Hollow, West Cottage Grove, Fairoaks, and Elkhead.

Options B and C would avoid the heavily developed Fox Hollow Road area in South Eugene and so would reduce visual impacts on residential land use. Option B, however, would open a new corridor through a developing rural residential area and would create moderate impacts. Modified Option G represents the alignment that reduced effects on rural residential land use in a portion of the Evans Creek area. In the Medford Basin, where all options have moderately significant impacts, Options H, I, L, and M would increase residential impacts associated with incremental visual intrusion along the existing corridor, but would avoid other impacts associated with opening a new corridor through more sparsely developed terrain on the perimeter of the Medford Basin. Options L and M also appear to require the purchase of three residences near the Meridian Tap to reserve sufficient right-of-way for possible future 500 kV development.

Economic and Social Conditions

The effects of the proposed transmission line on agricultural and forest productivity, local tax bases, and economic activity in the surrounding area would be insignificant, although some individual landowners would experience or perceive adverse effects. Social consequences resulting from an influx of transmission line workers, noise, and electrical and magnetic effects would also be insignificant. Adverse social reaction to the project would likely be significant in some areas, although this response cannot be measured and stems directly from land use, visual and other impacts. Negative economic and social effects could result from the no action alternative, but the severity and likelihood of such effects cannot be established.

2598B

CHAPTER 1

DESCRIPTION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION

PURPOSE OF AND NEED FOR ACTION

PURPOSE OF ACTION

Purposes are the goals Pacific Power and Light (Pacific) and Bonneville Power Administration (BPA) intend to accomplish with the proposal. Specifically, the purposes to be achieved by the proposal are to:

1) minimize environmental impacts
2) provide a reliable system for electrical service
3) plan to accommodate future needs
4) minimize costs
5) comply with all existing laws

NEED FOR ACTION

Increasing electric load in Pacific's southern Oregon and northern California service areas will soon exceed the capability of the transmission system to carry those anticipated loads and will result in the interruption of electric service (forced customer outages).

The historic peak loads for Pacific's northern California and southern Oregon service area and certain BPA customers within this area to which Pacific delivers energy are shown below.

Operating Period (July-June)	Peak-MW
1971-72	741
1972-73	883
1973-74	795
1974-75	837
1975-76	944
1976-77	1006
1977-78	977
1978-79	1100
1979-80	1120
1980-81	1072

Table 1-1 shows the forecasted load growth in the area through the winter of 1989-1990. The cause for this growth has been attributed to expanding residential, commercial, and industrial electrical consumption in the Pacific service area. This information has been compiled from forecasts submitted by Pacific and BPA. The methodology used in developing these forecasts is similar to the approach used by the State of Oregon Department of Energy in developing its biennial forecast of state energy demands.

The forecasts indicate annual average energy percentage growth rates ranging from 3.8 percent to 5.6 percent. The percentage increase reflects recovery from current poor economic conditions. Additional transmission support is needed to meet the forecasted load demands,

TABLE 1-1

PACIFIC POWER AND LIGHT COMPANY FORECAST OF SYSTEM FIRM LOADS, SOUTHWEST DIVISION, EXCLUDING COOS BAY AND INCLUDING LOADS SERVED BY BONNEVILLE POWER ADMINISTRATION

PEAK-MW

		BPA LOADS				
	Pacific Loads[1]	City of Ashland[2]	Other BPA Loads[3]	Less Estimated Transmission Losses[4]	Total Net Area Load	
1981-82	1134	37	155	49	1277	
1982-83	1199	39	158	51	1345	
1983-84	1260	41	162	53	1410	
1984-85	1337	43	166	55	1491	
1985-86	1431	46	170	57	1590	Phase I scheduled for completion by this peak period
1986-87	1518	48	175	59	1682	
1987-88	1552	50	180	62	1720	
1988-89	1606	51	186	64	1779	Phase II scheduled for completion by this peak period
1989-90	1642	52	191	67	1818	

ANNUAL AVERAGE PERCENTAGE GROWTH RATES

1981-82 to 1985-86	5.6 percent
1985-86 to 1988-89	3.8 percent
1981-82 to 1988-89	4.9 percent

Sources: [1] Pacific Power and Light Company, *Southwest Division Forecast*, September 1981.
[2] Load Forecasting and Analysis Dept., Pacific Power and Light Company.
[3] Bonneville Power Administration.
[4] Electrical Engineering Dept., Pacific Power and Light Company.

provide reliable electric service, improve the regional transmission system reliability, and meet Pacific's customer service requirements in southern Oregon and northern California. Power is currently transmitted to this area by one 500,000 volt transmission line between Midpoint, Idaho and Medford, Oregon, with a connection at Malin, Oregon and four 230,000 volt transmission lines: two from Eugene to Roseburg, one from Malin to Klamath Falls, and one from Redmond, Oregon to Klamath Falls. This system, with internal hydroelectric generation in the area, has a firm capability of serving 1482 megawatts of peak load.

This system would be unable to withstand one major unscheduled outage beyond the winter of 1985-1986 without an interruption in service. At that time, an outage of Pacific's Malin to Medford 500 kV transmission line would cause system voltages in the southern Oregon and northern California areas to drop to an unacceptably low level under peak load conditions and would result in power outages.

The staff of the State of Oregon Public Utility Commissioner, in testimony before the Energy Facility Siting Council, indicated that additional transmission support is needed to provide reliable electric service to Pacific's service area in southern Oregon and northern California (Oregon EFSC 1982).

Additional transmission support is needed to the Roseburg area by the winter of 1985-1986 (Phase I of proposed action); additional transmission support to the Medford area is needed for the winter of 1988-1989 (Phase II of proposed action).

The system, if completed as proposed, will increase transmission capability to approximately 2500 MW of peak load.

OTHER NEEDS

Although the anticipated load growth in southern Oregon and northern California is the predominant need for the Eugene-Medford line, anticipated load growth in the Eugene area defines a future requirement which can be satisfied concurrently with the need to increase transmission capability to southern Oregon.

BPA load growth projections indicate a potential problem with the reliability of service in the Eugene area in the late 1990s. The BPA Fiscal Year 1984 Load Forecast projects that the combined loads for the BPA customers in the Eugene area will grow from the current level of approximately 1,000 MW to 1,500 MW by the late 1990s. This forecast corresponds to an annual load growth rate between 3 and 4 percent. The forecast is based upon projections supplied by the individual public utilities in the Eugene area, and incorporates the effects of conservation efforts by the utilities and their customers. The amount of electricity required to meet the projected 1500 MW load is beyond the transmission capacity of the existing local system. Overloading the lines and equipment will cause them to malfunction or be permanently damaged. As a result, the BPA service to the Eugene area will not be reliable and will require strengthening. BPA proposes to do this by developing a 500 kV connection between Lane and Alvey Substations, thus completing a 500 kV loop joining the major sources of power for this area.

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The basic objective of the construction alternatives is to connect Meridian Substation east of Medford with either Lane or Alvey Substation near Eugene. The first alternative accomplishing this objective is the agency draft preferred alternative, as initially identified by the Bureau of Land Management (BLM) of the U.S. Department of the Interior (the lead government agency for environmental analysis on the project) and the other cooperating agencies. The draft preferred alternative determined the project configuration proposed by Pacific in its Site Certificate Application to the Energy Facility Siting Council (EFSC) of the State of Oregon, although it is not the project configuration ultimately approved by EFSC. The draft preferred alternative also reflects initial input received from BPA concerning the portion of the line which that agency would construct. Alternatives to the draft preferred alternative include Alternative 1, the no action alternative; Alternative 2, the parallel alternative; Alternative 3, the double circuit alternative; and Alternative 4, the new preferred alternative. Alternative 4 differs from the other three construction alternatives with respect to the routing in the Eugene, Medford and Evans Creek areas, reflecting public concern and subsequent agency review of the original proposal. These alternatives are described and compared in this section.

To satisfy future requirements, BPA has assumed the responsibility for the proposed construction in the Eugene area. BPA long-range planning has anticipated the construction of a 500 kV transmission line between the Lane and Alvey Substations. The line and its associated facilities in the substations would allow for the transmission of the additional power required in the area. Eventual construction would enclose the City of Eugene within a 500 kV transmission loop. This loop, a common utility practice for bringing electricity into metropolitan areas, has the capability to provide reliable service under almost all anticipated adverse operating conditions.

Although the requirement for the tie between Lane and Alvey is not forecasted until the late 1990's, the Eugene-Medford transmission proposal by Pacific prompted BPA to consider building part of the interconnection by 1986. The proposed construction would satisfy the immediate need of Pacific for a 500 kV source at Eugene as well as part of the future BPA requirement for a loop around Eugene. The joint proposal would also be consistent with the other purposes of BPA's future planning, especially the goals to minimize impacts to the environment and to accommodate future needs and provide reliable electrical service.

In addition to these alternatives, there are thirteen routing and design options, identified as Options A through M, which could be employed in various sections of the line. The options differ from the alternatives in that the options are modifications that affect only a portion of the route between Eugene and Medford, and therefore could be adopted for more than one alternative. An orientation map is presented in Figure 1-1, while more detailed information on the options and alternatives is shown in Figures 1-2 and 1-3.

FIGURE 1-1

FIGURE 1-1
ORIENTATION MAP

NEW PREFERRED ALTERNATIVE

TOWNS & CITIES

EXISTING SUBSTATIONS & SWITCHING STA.

DRAFT PREFERRED ALTERNATIVE

OPTIONS WITHIN PREFERRED AND OTHER ALTERNATIVES

INTERSTATE HIGHWAY

STATE OR U.S. HIGHWAY

COUNTY LINE

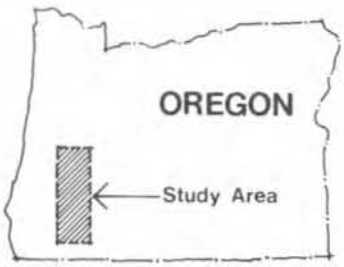
RIVER

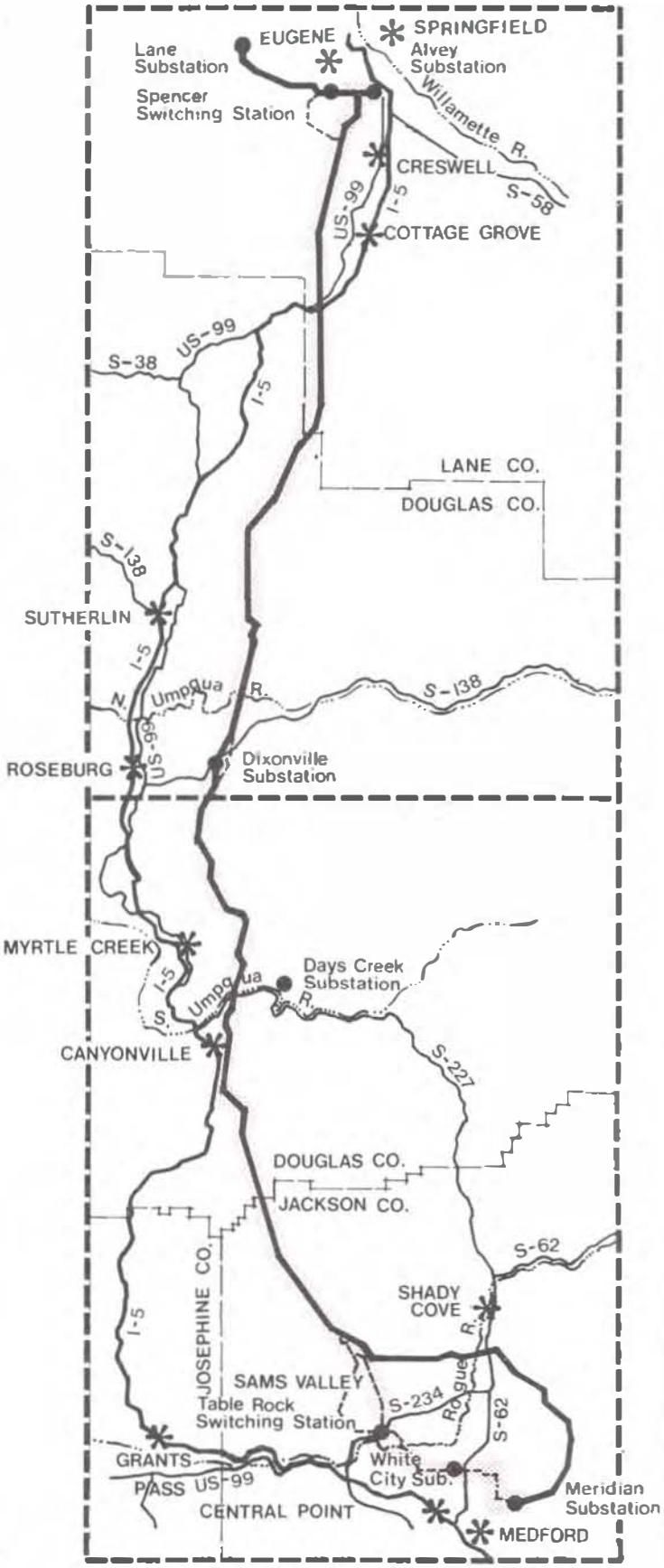
STUDY MAP LIMITS

Proposed
EUGENE MEDFORD 500kV TRANSMISSION LINE

for Pacific Power & Light

north





SCALE IN MILES 0 5 10 20 30 40

ORIENTATION MAP

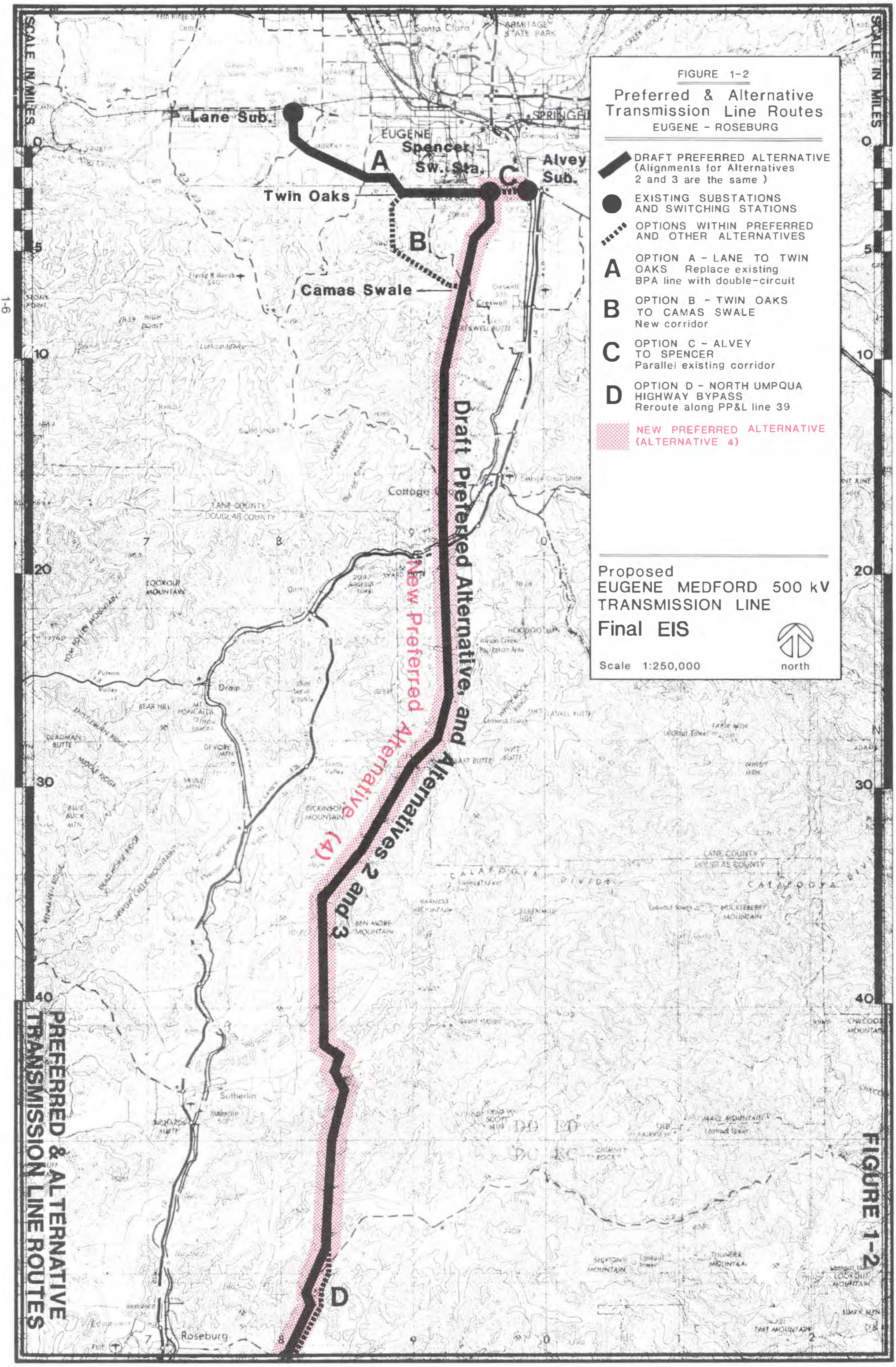


FIGURE 1-2
Preferred & Alternative Transmission Line Routes
EUGENE - ROSEBURG
DRAFT PREFERRED ALTERNATIVE (Alignments for Alternatives 2 and 3 are the same)
EXISTING SUBSTATIONS AND SWITCHING STATIONS
OPTIONS WITHIN PREFERRED AND OTHER ALTERNATIVES
A OPTION A - LANE TO TWIN OAKS Replace existing BPA line with double-circuit
B OPTION B - TWIN OAKS TO CAMAS SWALE New corridor
C OPTION C - ALVEY TO SPENCER Parallel existing corridor
D OPTION D - NORTH UMPQUA HIGHWAY BYPASS Reroute along PP&L line 39
NEW PREFERRED ALTERNATIVE (ALTERNATIVE 4)
Proposed
EUGENE MEDFORD 500 kV
TRANSMISSION LINE
Final EIS
Scale 1:250,000
north
SCALE IN MILES
Lane Sub.
Twin Oaks
Spencer Sw. Sta.
Alvey Sub.
Camas Swale
Draft Preferred Alternative and Alternatives 2 and 3
New Preferred Alternative (4)
A
B
C
D
EUGENE
Cottage
Sutherlin
Roseburg
PREFERRED & ALTERNATIVE TRANSMISSION LINE ROUTES
FIGURE 1-2

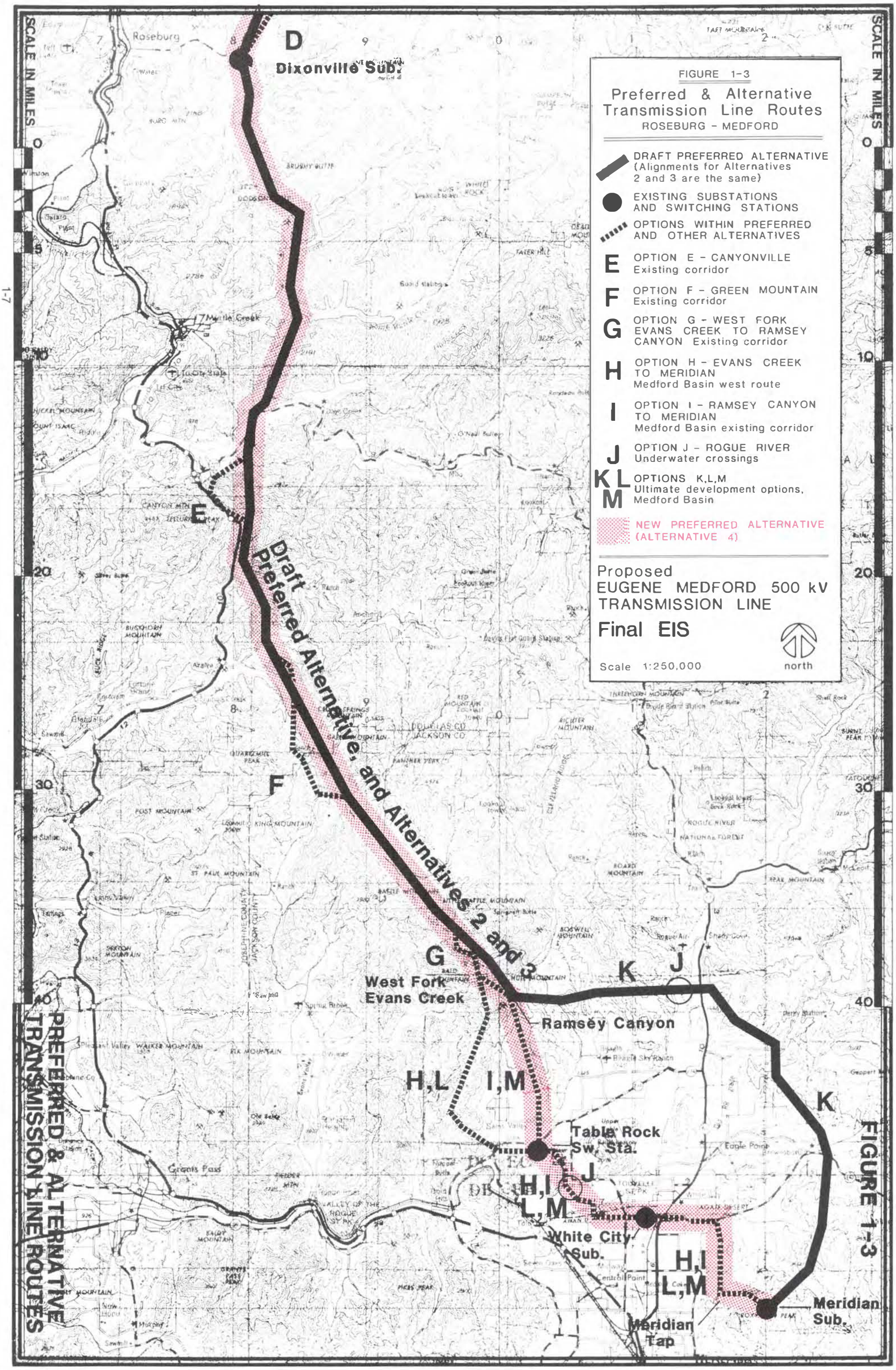


FIGURE 1-3
Preferred & Alternative Transmission Line Routes
ROSEBURG - MEDFORD
DRAFT PREFERRED ALTERNATIVE (Alignments for Alternatives 2 and 3 are the same)
EXISTING SUBSTATIONS AND SWITCHING STATIONS
OPTIONS WITHIN PREFERRED AND OTHER ALTERNATIVES
E OPTION E - CANYONVILLE Existing corridor
F OPTION F - GREEN MOUNTAIN Existing corridor
G OPTION G - WEST FORK EVANS CREEK TO RAMSEY CANYON Existing corridor
H OPTION H - EVANS CREEK TO MERIDIAN Medford Basin west route
I OPTION I - RAMSEY CANYON TO MERIDIAN Medford Basin existing corridor
J OPTION J - ROGUE RIVER Underwater crossings
K L M OPTIONS K,L,M Ultimate development options, Medford Basin
NEW PREFERRED ALTERNATIVE (ALTERNATIVE 4)
Proposed
EUGENE MEDFORD 500 kV TRANSMISSION LINE
Final EIS
Scale 1:250,000
north
SCALE IN MILES
Roseburg
D
Dixonville Sub.
E
F
G
West Fork Evans Creek
Ramsey Canyon
H,L
I,M
K
J
Table Rock Sw. Sta.
H,I
L,M
White City Sub.
Meridian Tap
Meridian Sub.
Draft Preferred Alternative, and Alternatives 2 and 3
PREFERRED & ALTERNATIVE TRANSMISSION LINE ROUTES
FIGURE 1-3

The completion of the 500 kV loop around Eugene is a connected action. To complete the loop, a combination of the draft preferred alternative and Option C or a combination of Option A and Option C would be constructed (see pp. 1-20 through 1-22). Impacts of these actions are identified, analyzed and compared in this Draft EIS.

A concise description of the alternatives and options is difficult because important parameters such as tower design and new access road and right-of-way requirements vary within each alternative. This variability exists because some alternatives and options involve replacing or paralleling transmission lines which were built at different times and which require different degrees of alteration to support a 500 kV transmission line. Further, two proponents are involved in this project, Pacific and BPA. The involvement of two utilities which employ different designs for their lines adds more variability to this project. Pacific would own and operate the portion of the proposed line south from Spencer Switching Station, which is approximately one mile south of Eugene, to Meridian Substation near Medford (see Figures 1-2 and 1-3). BPA would own and operate the line built from Spencer to either Lane or Alvey Substation.

Each alternative has been divided into segments to allow for more accurate and detailed description. The endpoints of these segments were defined so that the design parameters would be relatively unchanged within each segment. The endpoints of the segments are identified on Figures 1-2 and 1-3. Tables 1-2 and 1-3 present the pertinent design parameters for the alternatives and options. More detailed discussion of the design and right-of-way modifications associated with each alternative and option follows immediately, supported by sketches, while standard design information common to all construction alternatives is presented later in this section.

When evaluating information presented in Tables 1-2 and 1-3 and throughout this EIS, one should be aware that to date only preliminary engineering studies have been completed. As a result, quantification of the line's requirements and environmental impacts is based on assumptions of typical conditions applied to the alternatives and options under consideration. Each alternative and option is described below.

DRAFT PREFERRED ALTERNATIVE

The agency draft preferred alternative is used as a benchmark for comparison throughout this EIS to clearly present pertinent facts as briefly as possible. With the number of options analyzed in this EIS, it was determined most efficient to describe alternatives and options relative to the draft preferred alternative, and key these descriptions to figures and tables in the text. As a result, some information presented in this discussion will also be referenced later in the text.

TABLE 1-2
ALTERNATIVES SUMMARY OF REQUIREMENTS

Segment Name	Length (Miles)	New R/W width (Feet)	New R/W (Acres)	New Access Roads (Miles)	New Cleared R/W (Acres)	Tower Type	Cost ($)	
Agency Draft Preferred Alternative[1]								
Lane Substation-Twin Oaks (Parallel existing line on south side)	7.0	125.0	106.1	1.6	44.8	Lattice Double Circuit	7,300,000[2]	
Twin Oaks - Spencer Switching Station							4,600,000[2]	
(Twin Oaks-Junction w/115 kV lines; parallel existing 230 kV line on north side)	0.5	125.0	7.5	0.2	2.4	Lattice Double Circuit	500,000	
(Junction w/115 kV lines-Spencer Switching Station; replace existing BPA 115 kV lines with 500 kV double circuit line and 115 kV double circuit line)	4.0	0.0	0.0	0.5	0.0	Lattice Double Circuit	4,100,000	
							11,900,000	BPA Portion
Spencer Switching Station-Camas Swale (Replace Alvey-Dixonville line)								
(First 3.8 miles south of Spencer Switching Station)	3.8	50.0	23.0	0.6	5.5	Lattice		
From 3.8 miles south of Spencer Switching Station to Camas Swale)	1.0	0.0	0.0	0.1	0.0	Lattice	2,024,000	
Camas Swale - Dixonville Replace Alvey Dixonville)								
(Camas Swale-N. Umpqua Highway)	48.7	0.0	0.0	5.9	0.0	Lattice	19,474,000	
(N. Umpqua Highway-Dixonville)	5.1	0.0	0.0	0.6	0.0	Lattice		
Dixonville - Ramsey Canyon (Replace Line 54 north of West Fork Evans Creek)	35.8	75.0	324.6	5.9	192.1	Lattice	22,845,000	
(Canyonville-new alignment)	2.7	175.0	57.3	8.1	40.9	Lattice		
(Green Mountain-new alignment)	6.9	175.0	146.4	20.7	104.5	Lattice		
(West Fork Evans Creek/ Ramsey Canyon)								
new alignment	3.8	175.0	80.6	10.1	51.5	Lattice		
replace Line 54	0.5	75.0	4.5	0.1	3.0	Lattice		
Ramsey Canyon - Meridian Substation (New corridor east route)	27.0	175.0	572.7	63.6	357.6	Lattice	12,907,000	
	146.8		1,322.7	118.0	802.3		57,250,000	Pacific Portion
							69,150,000	Total Cost
Alternative 2 Parallel[1]								
Lane Substation-Twin Oaks (Parallel existing line on south side)	7.0	125.0	106.1	1.6	44.8	Lattice	7,300,000[2]	
Twin Oaks - Spencer Switching Station							4,600,000[2]	
(Twin Oaks-Junction w/115 kV lines; parallel on north side of existing 230 kV line)	0.5	125.0	7.5	0.2	2.4	Lattice	500,000	
(Junction w/ 115 kV lines-Spencer Switching Station; replace existing BPA 115 kV lines with 500 kV double circuit line and 115 kV double cirucit line)	4.0	0.0	0.0	0.5	0.0	Lattice	4,100,000	
							11,900,000	BPA Portion
Spencer Switching Station-Camas Swale (Parallel existing line on east side)	3.8	125.0	57.6	1.0	21.8	Lattice	2,471,000	
	1.0	125.0	15.2	0.1	1.2	Lattice		
Camas Swale - Dixonville (Parallel existing line on east side)								
(Camas Swale-N. Umpqua Highway)	48.7	137.5	811.7	11.9	490.8	Lattice	23,669,000	
(N. Umpqua Highway-Dixonville)	5.1	137.5	85.0	1.1	1.4	Lattice		
Dixonville - Ramsey Canyon (Parallel existing line on east side north of West Fork Evans Creek)	35.8	137.5	595.0	10.5	432.3	Lattice	23,658,000	
(Canyonville new alignment)	2.7	175.0	57.3	8.1	40.9	Lattice		
(Green Mountain new alignment)	6.9	175.0	146.4	20.7	104.5	Lattice		
(West Fork Evans Creek-Ramsey Canyon)								
new alignment	3.8	175.0	80.6	10.1	51.5	Lattice		
replace line 54	0.5	137.5	8.3	0.2	6.8	Lattice		
Ramsey Canyon - Meridian Substation (New corridor east route)	27.0	175.0	572.7	63.6	352.6	Lattice	12,907,000	
	146.8		2,543.4	129.6	1,551.0		62,705,000	Pacific Portion
							74,605,000	Total Cost

TABLE 1-2 (continued)
ALTERNATIVES SUMMARY OF REQUIREMENTS

Segment Name	Length (Miles)	New R/W width (Feet)	New R/W (Acres)	New Access Roads (Miles)	New Cleared R/W (Acres)	Tower Type	Cost ($)	
Alternative 3-Double Circuit[1]								
Lane Substation-Twin Oaks (Parallel existing line on south side)	7.0	125.0	106.1	1.6	44.8	Lattice Double Circuit	7,300,000	
Twin Oaks - Spencer Switching Station						Lattice Double Circuit (both cases)	4,600,000[2]	
(Twin Oaks-Junction w/115 kV lines, parallel existing 230 kV line on north side)	0.5	125.0	7.5	0.2	2.4		500,000	
							4,100,000	
(Junction w/115 kV lines-Spencer Switching Station; replace existing BPA 115 kV lines with 500 kV double circuit line and 115 kV double circuit line)	4.0	0.0	0.0	0.5	0.0		11,900,000	BPA Portion
Spencer Switching Station-Camas Swale (Replace Alvey-Dixonville line)						Lattice Double Circuit (both cases)		
(First 3.8 miles south of Spencer Switching Station)	3.8	50.0	23.0	0.6	5.5		3,870,000	
(From 3.8 miles south of Spencer Switching Station to Camas Swale)	1.0	0.0	0.0	0.1	0.0			
Camas Swale - Dixonville (Replace Alvey Dixonville)								
(Camas Swale-N. Umpqua Highway)	48.7	0.0	0.0	5.9	0.0	Lattice Double Circuit (both cases)	39,582,000	
(N. Umpqua Highway-Dixonville)	5.1	0.0	0.0	0.6	0.0			
Dixonville - Ramsey Canyon (Replace Line 54 north of West Fork Evans Creek)	35.8	75.0	324.6	5.9	192.1	Lattice Double Circuit	42,881,000	
(Canyonville-new alignment	2.7	175.0	57.3	8.1	40.9			
(Green Mountain-new alignment	6.9	175.0	146.4	20.7	104.5			
(West Fork Evans Creek/ Ramsey Canyon) new alignment	3.8	175.0	80.6	10.1	51.5			
replace Line 54	0.5	75.0	4.5	0.1	3.0			
Ramsey Canyon - Meridian Substation (New corridor east route)	27.0	175.0	572.7	63.6	357.6	Lattice Double Circuit	23,356,000	
	146.8		1,322.7	118.0	802.3		109,689,000	Pacific Portion
							121,589,000	Total Cost
Alternative 4 New Preferred Alternative								
Alvey Substation-Spencer Switching Station (Option C-Parallel existing lines on south side)	**2.0**	**125.0**	**30.3**	**0.6**	**15.8**	**Lattice**	**3,010,000[2]**	
Spencer Switching Station-Camas Swale (Replace Alvey-Dixonville line)								
(First 3.8 miles south of Spencer Switching Station)	**3.8**	**50.0**	**23.0**	**0.6**	**5.5**	**Lattice**		
(From 3.8 miles south of Spencer Switching Station to Camas Swale)	**1.0**	**0.0**	**0.0**	**0.1**	**0.0**	**Lattice**	**2,024,000**	
Camas Swale - Dixonville (Replace Alvey-Dixonville)								
(Camas Swale-N. Umpqua Highway)	**48.7**	**0.0**	**0.0**	**5.9**	**0.0**	**Lattice**	**19,474,000**	
(N. Umpqua Highway-Dixonville)	**5.1**	**0.0**	**0.0**	**0.6**	**0.0**	**Lattice**		
Dixonville - Ramsey Canyon (Replace Line 54 north of West Fork Evans Creek)	**35.8**	**75.0**	**324.6**	**5.9**	**192.1**	**Lattice**	**22,926,000**	
(Canyonville-new alignment)	**2.7**	**175.0**	**57.3**	**8.1**	**40.9**	**Lattice**		
(Green Mountain-new alignment)	**6.9**	**175.0**	**146.4**	**20.7**	**104.5**	**Lattice**		
(West Fork Evans Creek/ Ramsey Canyon) new alignment	**1.5**	**175.0**	**31.8**	**4.5**	**22.7**	**Lattice**		
replace Line 54	**3.5**	**75.0**	**31.8**	**0.6**	**18.9**	**Lattice**		
Ramsey Canyon-Meridian Substation (Option I)	**24.2**		**291.3**	**5.0**	**140.5**		**113,271,000**	
Ramsey Canyon-An Angle Point 3 miles from Table Rock (Replace Line 54)	**(4.8)**	**(75.0)**	**(43.6)**	**(0.7)**	**(27.9)**	**Lattice**		
An Angle point 3 miles from Table Rock Substation-Table Rock Substation (Replace with single pole)	**(3.0)**	**(50.0)**	**(18.1)**	**(0.4)**	**(6.7)**	**Single Pole**		
Table Rock Substation-White City Substation (Parallel on north side)	**(7.5)**	**(137.5)**	**(125.0)**	**(1.9)**	**(24.6)**	**Lattice**		
White City Substation-White City Rifle Range (Parallel within existing right-of-way)	**(3.0)**	**(0.0)**	**(0.0)**	**(0.4)**	**(0.0)**	**Single Pole**		
White City Rifle Range-Meridian Tap (Parallel on west side)	**(3.3)**	**(137.5)**	**(55.0)**	**(0.9)**	**(39.5)**	**Lattice**		
Meridian Tap-Meridian Substation (Parallel on north side)	**(2.6)**	**(157.5)**	**(49.6)**	**(0.7)**	**(41.8)**	**Lattice**		
	135.2		**936.5**	**52.6**	**540.9**		**60,705,000**	

[1] Design at North Umpqua River Crossing is not defined.

[2] BPA costs, all other costs in table are Pacific Power and Light Company costs.

TABLE 1-3
OPTIONS SUMMARY OF REQUIREMENTS

Segment Name	Length (Miles)	New R/W width (Feet)	New R/W (Acres)	New Access Roads (Miles)	New Cleared R/W (Acres)	Tower Type	Cost ($)
Option A: Lane Substation-Junction w/115 kV lines (Replace existing BPA 230 kV line)							
Lane Substation-Twin Oaks	7.0	0.0	0.0	0.8	0.0	Lattice Dbl Circuit	
Twin Oaks-Junction w/115 kV lines	0.5	0.0	0.0	0.1	0.0	Lattice	
	7.5		0.0	0.9	0.0	Double Circuit	6,900,000[1]
Option B: Lane Substation - Camas Swale (New Corridor)							
Lane Substation - Twin Oaks (South side of existing BPA 230 kV line)	7.0	125.0	106.1	1.6	44.8	Lattice	7,300,000[1]
Twin Oaks - Camas Swale (New corridor)	7.2	175.0	152.7	16.7	87.9	Lattice	4,630,000
	14.2		258.8	18.3	132.7		11,930,000
Option C: Alvey Substation-Spencer Switching Station (Parallel)[2]	2.0	125.0	30.3	0.6	15.8	Lattice	3,010,000
Option D: North Umpqua Highway Bypass	0.9	175.0	19.1	1.5	0.0	Lattice	
	4.2	150.0	76.4	1.0	4.5	Lattice	
	5.1		95.5	2.5	4.5		2,434,000
Option E: Canyonville (Existing Corridor)	4.2	75.0	38.2	0.8	21.8	Lattice	2,323,000
Option F: Green Mountain (Existing Corridor)	7.9	75.0	71.8	1.5	47.9	Lattice	3,579,000
Option G: West Fork Evans Creek-Ramsey Canyon (Existing Corridor)	4.5	75.0	40.9	0.7	24.2	Lattice	2,158,000
Modified Option G: West Fork Evans Creek-Ramsey Canyon[2]							
(New alignment)	1.5	175.0	31.8	4.5	22.7	Lattice	
(Existing Corridor)	3.0	75.0	27.3	0.5	16.2	Lattice	
	4.5		59.1	5.0	38.9		2,080,000

TABLE 1-3 (continued)
OPTIONS SUMMARY OF REQUIREMENTS

Segment Name	Length (Miles)	New R/W width (Feet)	New R/W (Acres)	New Access Roads (Miles)	New Cleared R/W (Acres)	Tower Tower Type	Cost Cost ($)
Option H: Medford Basin West Route							
West Fork Evans Creek-Lyman Mountain[3]							
new alignment	10.9	175.0	231.2	31.7	160.6	Lattice	
replace line 54	1.3	75.0	11.8	0.2	6.7	Lattice	
Lyman Mountain-Table Rock Substation (Parallel)	1.8	137.5	30.0	0.5	20.5	Lattice	
Table Rock Substation-White City Substation (Parallel on north side)	7.5	137.5	125.0	1.9	24.6	Lattice	
White City Substation-White City Rifle Range (Parallel within existing right-of-way)	3.0	0.0	0.0	0.4	0.0	Single Pole	
White City Rifle Range-Meridian Tap (Parallel on west side)	3.3	137.5	55.0	0.9	39.5	Lattice	
Meridian Tap-Meridian Substation (Parallel on north side)	2.6	157.5	49.6	0.7	41.8	Lattice	
	30.4		502.6	36.3	293.7		16,062,000
Option I: Medford Basin (Existing Corridor)[2]							
Ramsey Canyon-An Angle Point 3 miles from Table Rock (Replace Line 54)	4.8	75.0	43.6	0.7	27.9	Lattice	
An Angle point 3 miles from Table Rock Substation-Table Rock Substation (Replace with single pole)	3.0	50.0	18.1	0.4	6.7	Single Pole	
Table Rock Substation-White City Substation (Parallel on north side)	7.5	137.5	125.0	1.9	24.6	Lattice	
White City Substation-White City Rifle Range (Parallel within existing right-of-way)	3.0	0.0	0.0	0.4	0.0	Single Pole	
White City Rifle Range-Meridian Tap (Parallel on west side)	3.3	137.5	55.0	0.9	39.5	Lattice	
Meridian Tap-Meridian Substation (Parallel on north side)	2.6	157.5	49.6	0.7	41.8	Lattice	
	24.2		291.3	5.0	140.5		13,271,000
Option J - Rogue River Underwater Crossing							
New Corridor	1.8	50.0	10.9	2.6	7.0	Oil Filled Cable	
Existing Corridor	1.0	50.0	6.0	0.2	2.0	Oil Filled Cable	
Option K - Medford Basin Preferred Alternative, Ultimate Development							
(West Fork Evans Creek - Ramsey Canyon)							
new alignment	3.8	300	138.2	10.1	51.5	Lattice	
replace line 54	0.5	200	12.1	0.1	3.0		
Ramsey Canyon-Meridian Substation (East Route)	27.0	300	981.8	63.6	357.6	Lattice	
	31.3		1132.1	73.8	412.1		15,636,000
Potential Future Reguirements		—	—	8.5	412.1		
Option L - Medford Basin West Route Ultimate Development							
West Fork Evans Creek-Lyman Mountain							
new alignment	10.9	300.0	396.4	31.7	160.6	Lattice	
replace line 54	1.3	200.0	31.5	0.2	6.7	Lattice	
Lyman Mountain-White City Rifle Range (Parallel)	12.3	137.5	205.0	3.2	45.1	Lattice Dbl Circuit	
White City Rifle Range-Meridian Tap (Parallel on west side)	3.3	262.5	55.0	0.9	39.5	Lattice	
Meridian Tap-Meridian Substation (Parallel on north side)	2.6	282.5	49.6	0.7	41.8	Lattice	
	30.4		737.5	36.7	293.7		22,382,000
Potential Future Requirements			5.4	5.4	260.6		
Option M - Medford Basin Ultimate Development Existing Corridor							
(West Fork Evans Creek-Ramsey Canyon							
New Alignment	3.8	300	138.2	10.1	51.5	Lattice	
replace Line 54	0.5	200	12.1	0.1	3.0		
Ramsey Canyon-An Angle Point 3 miles from Table Rock	4.8	200	116.4	0.7	27.9	Lattice	
An Angle Point 3 miles from Table Rock Substation-Table Rock Substation (Replace with double circuit)	3.0	75.0	27.3	0.4	6.7	Single Pole	
Table Rock Substation-White City Rifle Range (Parallel on south side)	10.5	137.5	175.0	2.7	24.6	Lattice Dbl Circuit	
White City Rifle Range-Meridian Tap (Parallel on west side)	3.3	262.5		0.9	39.5	Lattice	
Meridian Tap-Meridian Substation (Parallel on north side)	2.6	282.5		0.7	41.8	Lattice	
	28.5		469.0	15.6	195.0		21,159.000
Potential Future Requirements	—	—		4.3	218.8		

[1] BPA costs, all other costs are Pacific costs.

[2] **Part of new preferred alternative: substitute for corresponding portions of draft preferred alternative.**

[3] Assumes that new alignment of the proposed route would be followed from West Fork Evans Creek to Junction with Medford Basin West Route. If it is assumed that West Route ties into existing corridor (Option G) the new alignment portion (requiring a 175' right-of-way) would be 9.5 miles and the segment to be replaced would be 2.9 miles.

Lane-Twin Oaks

As indicated in Table 1-2, the agency draft preferred alternative would begin at Lane Substation and parallel the existing BPA 230 kV transmission line on the south side for 7.5 miles to a point near Twin Oaks, where the existing BPA 115 kV lines (from Eugene Substation) enter the 230 kV corridor. All switches and associated equipment would be located in the existing equipment yard at the BPA Lane Substation. BPA would construct this segment (Lane-Twin Oaks) of the line using its standard double circuit 500 kV tower design. A sketch of a typical BPA 500 kV transmission line tower, including a comparison to the existing BPA line, is shown in Figure 1-4.

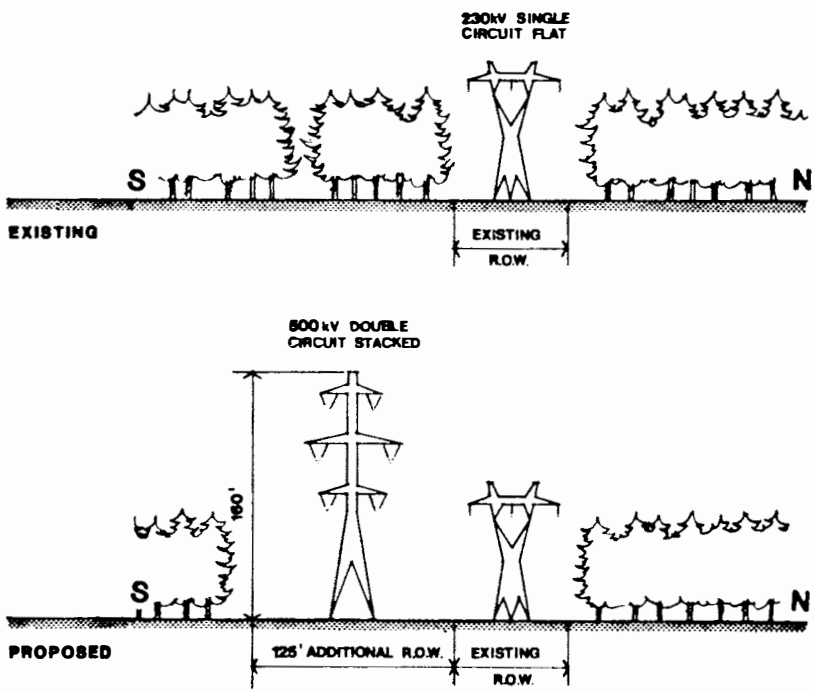


FIGURE 1-4 TYPICAL CORRIDORS IN THE LANE-TWIN OAKS SEGMENT OF DRAFT PREFERRED ALTERNATIVE

Twin Oaks to Spencer

From Twin Oaks east to Spencer Switching Station, the two existing 115 kV lines would be removed and replaced by a single pole 115 kV double circuit line. The 115 kV circuits might be temporarily located on the 500 kV towers, but would eventually be supported on a double circuit single wood pole line with steel davit arms as shown in Figure 1-5. Construction of the double circuit 115kV line would be needed to allow sufficient room in the existing right-of-way to accommodate the new line. A double circuit 500 kV line would also be constructed in the existing right-of-way. This 4.0-mile corridor segment is shown under current and proposed conditions in Figure 1-5. All lines from Lane Substation to Spencer Switching Station would be constructed and operated by BPA.

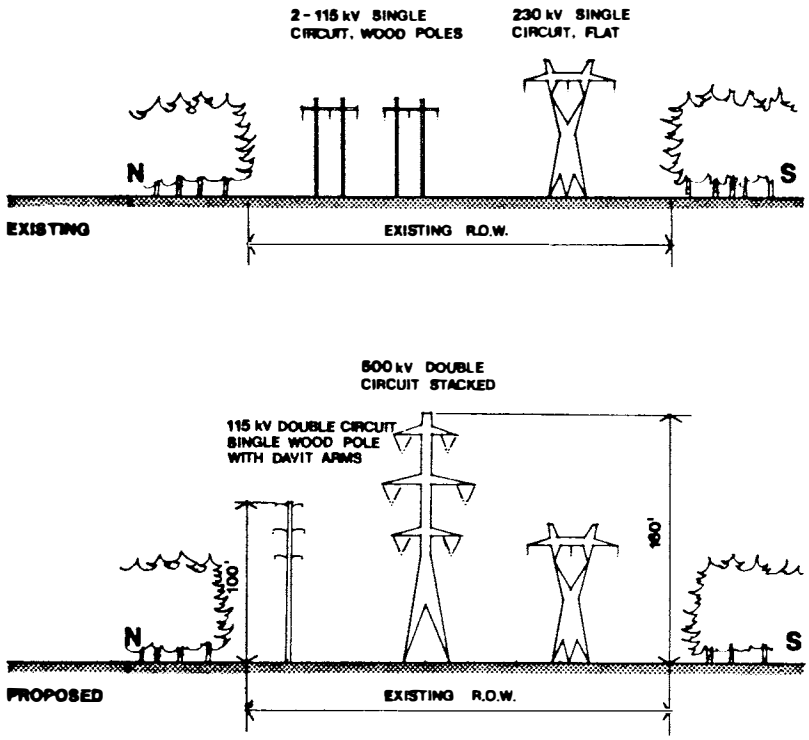


FIGURE 1-5 TYPICAL CORRIDORS IN THE TWIN OAKS-SPENCER SEGMENT OF DRAFT PREFERRED ALTERNATIVE

Spencer Switching Station to Dixonville

From Spencer Switching Station south to Dixonville (a total of 58.6 miles), Pacific's existing Alvey-Dixonville 230 kV Transmission Line would be replaced by a single circuit 500 kV transmsission line constructed with towers such as the one shown in Figure 1-6. In this segment Pacific lines are supported by several types of structures on rights-of-way which vary considerably in width. Figure 1-6 presents existing conditions typical of the two most common cases. This configuration is common to both the draft and new preferred alternatives.

The existing Dixonville Substation at the end of this segment would be modified with the addition of a 230 kV to 500 kV transformer bank and power circuit breakers. This development would be located on the existing substation property.

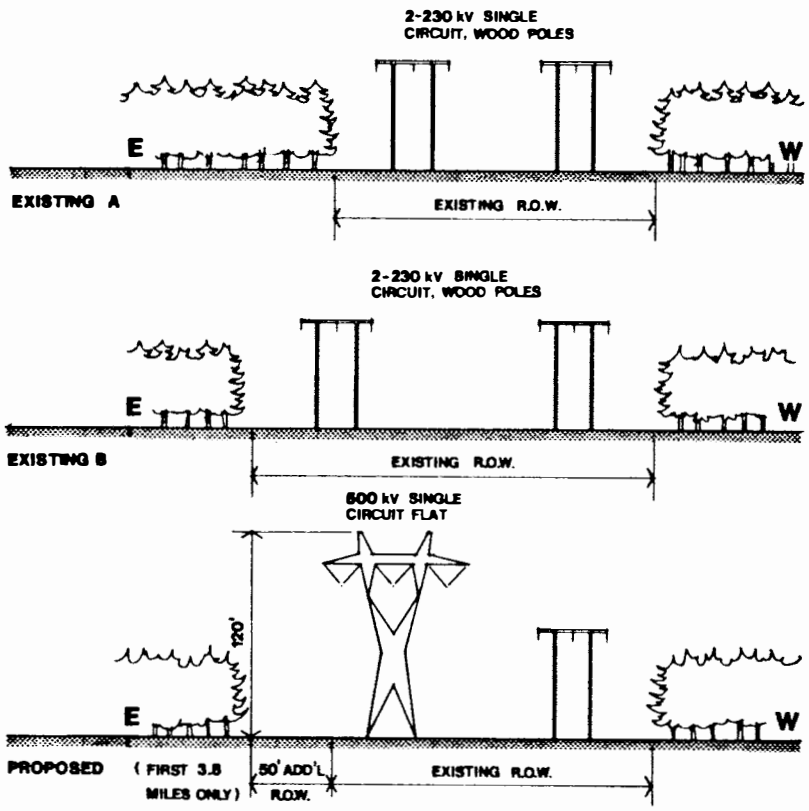


FIGURE 1-6 TYPICAL CORRIDORS IN THE SPENCER-DIXONVILLE SEGMENT OF DRAFT PREFERRED ALTERNATIVE

Dixonville to Ramsey Canyon

From Dixonville to Ramsey Canyon, Pacific would construct a single circuit 500 kV transmission line on much of the right-of-way currently occupied by its Line 54, which would be removed to accommodate the new line. This configuration is common to both the draft and new preferred alternatives. Typical conditions in this segment are shown in Figures 1-7 and 1-8. As shown in Figure 1-7, two other existing lines parallel Line 54 from Dixonville to the Canyonville area. From Canyonville south, Line 54 does not parallel other lines, as shown in Figure 1-8.

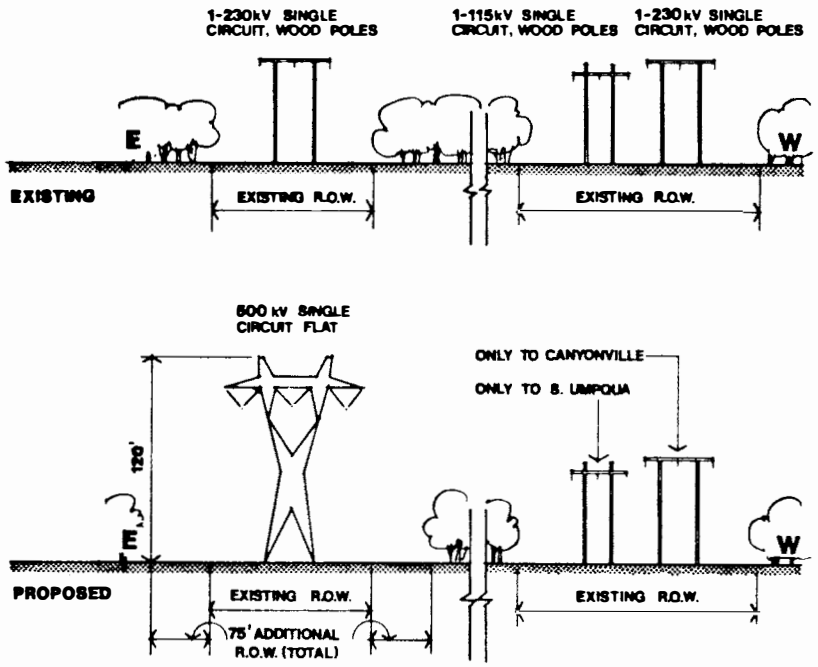


FIGURE 1-7 TYPICAL CORRIDORS IN THE DIXONVILLE-CANYONVILLE SECTION OF THE DIXONVILLE-RAMSEY CANYON SEGMENT OF DRAFT PREFERRED ALTERNATIVE

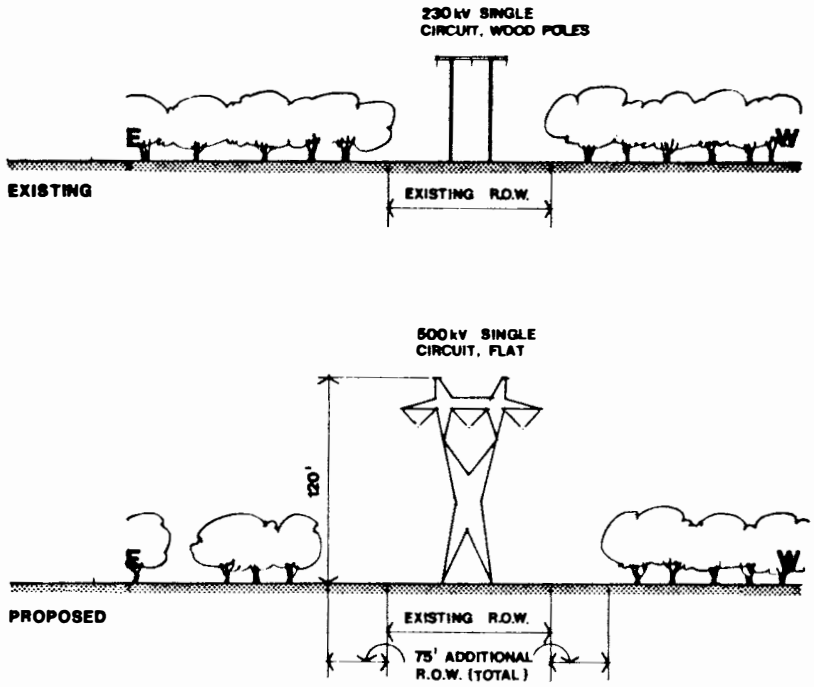


FIGURE 1-8 TYPICAL CORRIDORS IN THE CANYONVILLE-RAMSEY CANYON SECTION OF DRAFT PREFERRED ALTERNATIVE

Although the draft preferred alternative would involve removal and replacement of Line 54 over most of its length, there are three segments where the proposed alignment would not follow the existing Line 54 right-of-way. In these areas, where Pacific desires to shorten the overall length of the line and reduce total project cost, the draft preferred alternative would involve acquisition of new right-of-way and the construction of a line such as shown in Figure 1-9. In these realigned areas, Pacific would remove the existing line and relinquish its easements in all but one case. The exception occurs for approximately three miles of the Canyonville relocation where the abandoned right-of-way would be retained to accommodate a future line to Grants Pass.

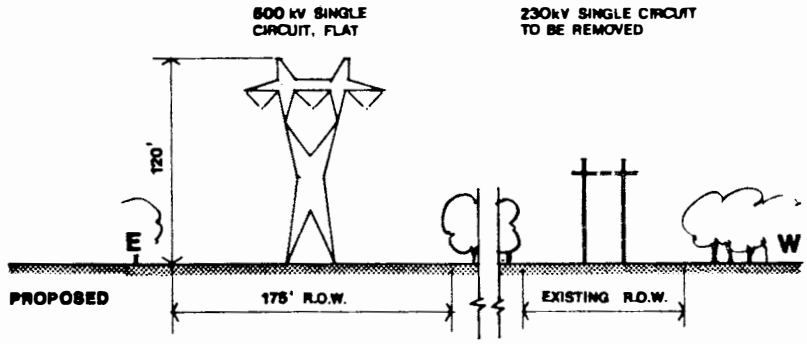


FIGURE 1-9 TYPICAL CORRIDOR IN THE REALIGNED PORTION OF THE DIXONVILLE-RAMSEY CANYON SEGMENT OF THE DRAFT PREFERRED ALTERNATIVE

Ramsey Canyon to Meridian

At Ramsey Canyon, the draft preferred alternative would go east and south to Meridian Substation via the new corridor presented in the Routing Study Report. The routing is shown in Figure 1-2, while the type of tower and amount of right-of-way that would be required is shown in Figure 1-10. Meridian Substation would be modified by adding a power circuit breaker within the existing substation yard.

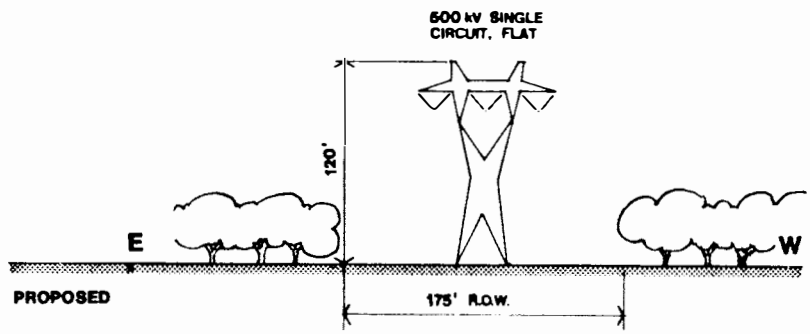


FIGURE 1-10 TYPICAL CORRIDOR IN THE RAMSEY CANYON-MERIDIAN SUBSTATION SEGMENT OF DRAFT PREFERRED ALTERNATIVE

Summary of Draft Preferred Alternative

As shown in Table 1-2, requirements for the draft preferred alternative would include construction of 146.8 miles of new transmission line, acquisition of approximately 1,323 acres of new right-of-way, and construction of 118 miles of access road at a total cost of $69,150,000. Pacific's portion would cost an estimated $57,250,000 while the BPA segments near Eugene would cost about $11,900,000.

ALTERNATIVE 1, THE NO-ACTION ALTERNATIVE

In this alternative, no new facilities would be constructed and the existing transmission lines would not be altered. No special or additional actions would be taken to satisfy the need for the proposal.

ALTERNATIVE 2, THE PARALLEL ALTERNATIVE

The parallel alternative would follow the same route as the draft preferred alternative. However, in most segments it would involve constructing a line adjacent to existing lines rather than replacing them with new lines. In certain areas, such as between Twin Oaks and Spencer Switching Station, paralleling the existing lines is considered infeasible because extensive development has occurred adjacent to the

existing line. The parallel alternative would be identical to the draft preferred alternative in these segments. In the other portion of the BPA section (i.e., Lane-Twin Oaks), these alternatives would also be the same because the draft preferred alternative parallels the existing line in this segment. Thus, in the BPA portion of the line, the draft preferred and parallel alternatives would be identical. The parallel alternative would also be identical to the draft preferred alternative in the segments where a new corridor would be established (e.g. Green Mountain) because in these areas there is no existing line to parallel. The detailed configuration of the parallel alternative is described below.

The parallel alternative would be identical to the draft preferred alternative between Lane Substation and Spencer Switching Station, as shown in Figures 1-4 and 1-5. BPA would build, operate, and maintain this section. From Spencer Switching Station to Ramsey Canyon the parallel alternative would be on the east side of the existing line; a representative view is shown in Figure 1-11. The number of existing lines in the corridor between Spencer Switching Station and Ramsey Canyon varies; Figure 1-11 presents a typical condition. In addition, the parallel route would follow new alignments in the same areas as the preferred alternative, requiring new right-of-way as depicted in Figure 1-9. From Ramsey Canyon to Meridian, the parallel alternative would be identical to the draft preferred alternative.

The overall requirements of the parallel alternative include the need to acquire approximately 2,543 acres of right-of-way, construct 130 miles of access road, and clear 1,551 acres. The total cost would be $74,605,000, with the Pacific portion of the line representing $62,705,000 and BPA's portion being $11,900,000.

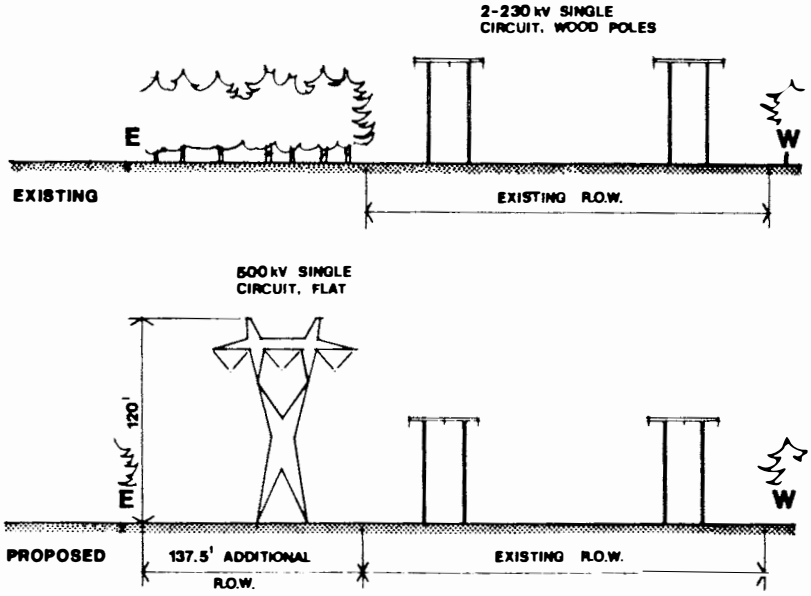


FIGURE 1-11 TYPICAL CORRIDORS IN THE SPENCER SWITCHING STATION-RAMSEY CANYON SEGMENT OF ALTERNATIVE 2 (PARALLEL)

ALTERNATIVE 3, DOUBLE CIRCUIT ALTERNATIVE

Alternative 3 would be the same as the draft preferred alternative except that double circuit towers, shown in Figure 1-12 or 1-13, would be used for most of the route. Figure 1-12 depicts a typical condition between Spencer and Ramsey Canyon, although as shown in Table 1-2, there would be variability along the route. A double circuit tower such as shown in Figure 1-5 would be used in the BPA portion of this alternative. The basic feature of this alternative would be towers that can support two 3-phase lines instead of only one 3-phase line. Use of these towers would modify other design parameters such as cost, reported in Table 1-2. A double circuit line would require the same or slightly less right-of-way than a single circuit line, as the greater height of the towers would allow a portion of the minimum conductor separation to be achieved in the vertical rather than horizontal plane. The double circuit alternative would facilitate installation of a second 500 kV line in the future without additional right-of-way acquisition.

In summary, the double circuit alternative would be similar to the draft preferred alternative except that Alternative 3 would use the tower shown in Figure 1-12 for the entire route. The overall requirements of the double-circuit alternative would include the need to acquire approximately 1,323 acres of right-of-way, construct 118 miles of access road, and clear 802 acres. The total cost of this alternative would be $121,689,000, including $109,689,000 for the portion south of Spencer to be built by Pacific.

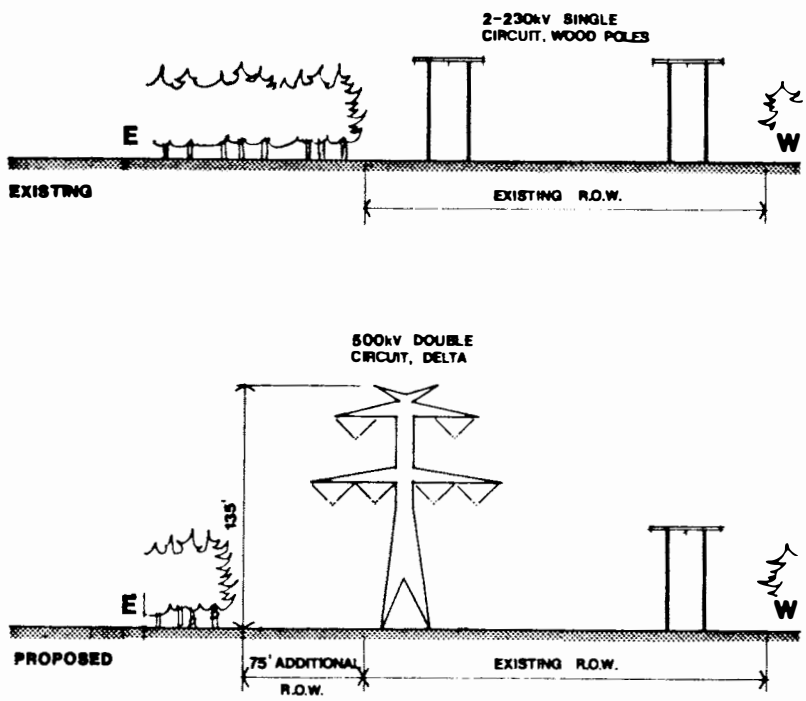


FIGURE 1-12 TYPICAL CORRIDORS IN THE SPENCER SWITCHING STATION-RAMSEY CANYON SEGMENT OF ALTERNATIVE 3 (DOUBLE CIRCUIT)

ALTERNATIVE 4, NEW PREFERRED ALTERNATIVE

The Oregon Energy Facility Siting Council (EFSC) issued a site certificate for Pacific's proposed transmission line in September of 1982. This site certificate reflected public comment on the DEIS as augmented by testimony under Oregon administrative procedure. It stipulated construction on a route from Spencer Switching Station to Meridian Substation via the existing corridor through the Medford Basin (Option I). The site certificate also incorporates a modification of Option G (see Table 1-2) into the route. Additionally, EFSC granted the site certificate to Pacific contingent upon construction of the northern terminal segment between Spencer and Alvey Substation (Option C), rather than from Spencer to Lane Substation as proposed. The impacts of Options C and I relative to the corresponding portions of the draft preferred alternative provided the rationale for the EFSC recommendation.

A fourth project alternative has therefore been established as a result of the EFSC action, consisting of the draft preferred alternative incorporating Options C, I and Modified Option G. With the exception of these substitutions, the configuration of Alternative 4 would be the same as the appropriate components of the draft preferred alternative; the design and associated requirements of the substitute components are described subsequently. Given the net reductions in right-of-way and access requirements for the EFSC recommendation, Alternative 4 would be 135.2 miles long and would require 937 acres of additional right-of-way. Approximately 541 acres of new right-of-way would have to be cleared, and 53 miles of new access road would need to be constructed. The total cost of Alternative 4 would be $60,705,000, including $57,695,000 for the portion south of Spencer to be built by Pacific.

OPTIONS WITHIN ALTERNATIVES

Thirteen options, identified as A through M, could be employed along the route between Eugene and Medford, singly or in varying combinations. Each option is described below and compared briefly with the segment of the draft preferred alternative which it would replace.

Option A - Lane Substation - Twin Oaks (Replace Existing BPA Line With Double Circuit Line)

The draft preferred alternative would include construction of a double circuit line parallel to the existing line between Lane Substation and Twin Oaks. Option A would differ in that it would involve removing the existing 230 kV transmission line in this corridor and replacing it with a double circuit line as shown in Figure 1-13 (one circuit would initially be operated at 230 kV and the other at 500 kV). As in the draft preferred alternative, BPA would build, operate, and maintain the line in this option. This option, 7.5 miles long, would not affect the total length of the Eugene-Medford line, but would eliminate the need

for additional right-of-way, as a double circuit line could be constructed on the existing 230 kV right-of-way. Option A would cost $6,900,000 as opposed to $7,300,000 for the draft preferred alternative in this segment. All switches and associated equipment will be located in the existing equipment yard at the BPA Lane Substation.

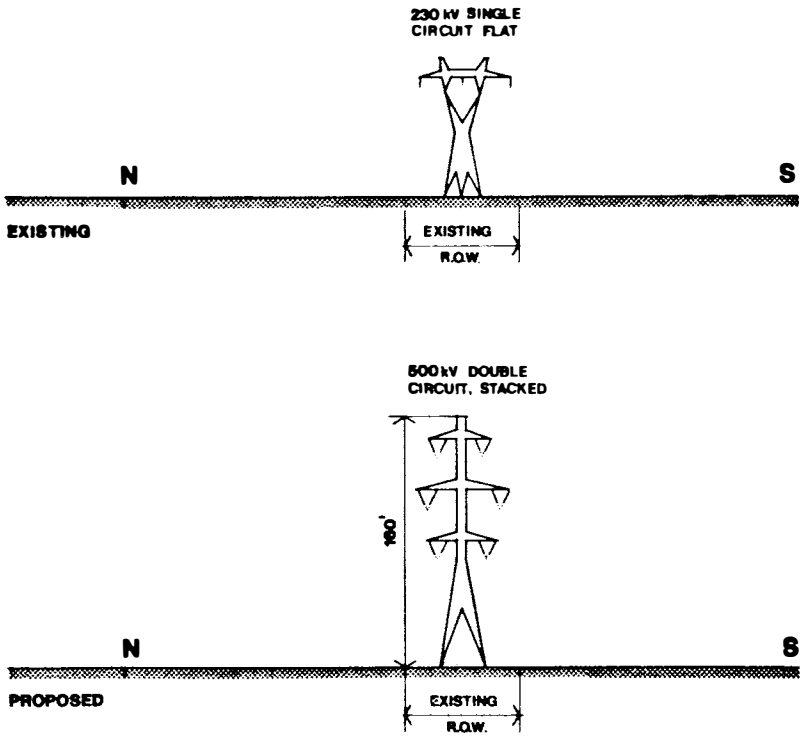


FIGURE 1-13 TYPICAL CORRIDORS FOR OPTION A (DOUBLE CIRCUIT LANE-TWIN OAKS)

Option B - Lane-Camas Swale (New Corridor)

This option was identified in the Routing Study Report completed earlier in this study. Its location is shown in Figure 1-1, while right-of-way and engineering information are presented in Table 1-3. It is assumed that a double circuit structure, as shown in Figure 1-13, would be used from Twin Oaks to Camas Swale, but this option would require a new right-of-way up to 175 feet wide. Overall, this 14.2 mile option would require 259 acres of new right-of-way, 18.3 miles of new access roads, and 133 acres of clearing at a cost of $11,930,000. Adoption of this option would reduce the overall line length by 2.1 miles and the total cost by $1,994,000 but would require approximately 130 additional acres of right-of-way.

To satisfy the future BPA plan to loop the Eugene area with a 500 kV transmission system, a new line would have to be constructed from Camas Swale to Alvey in the early 1990's. This 500 kV line could be located parallel to the existing right-of-way between Camas Swale and Alvey or on a new right-of-way between the two points. A switching station at Camas Swale would have to be constructed when the tie to Alvey is completed. The initial installation at the switching station would include three 500 kV power circuit breakers to terminate the 500 kV line to Dixonville, Lane, and Alvey Substations. These possible future developments, when firmly forecasted as a system addition, would be fully evaluated and addressed as required by the environmental legislation in effect at that time.

Option C - Alvey Substation - Spencer Switching Station

The project need could also be satisfied by a 500 kV line linking Alvey and Meridian Substations. This would require a line from Alvey to Spencer Switching Station and a line south from Spencer. Option C is the segment of line from Alvey to Spencer that would be required to make Alvey Substation the northern terminus of the proposed line. This segment has been included in the new preferred alternative.

The Alvey-Spencer option would parallel existing lines between Alvey and Spencer on the south side. The existing and modified corridors are shown in Figure 1-14 while engineering information is presented in Table 1-3. Option C would be 2.0 miles long, and would reduce the overall length of the line from Eugene to Medford by 9.5 miles. Because new right-of-way would be needed in this segment, 30 acres of additional right-of-way would be acquired; this compares to 114 acres for that portion of the draft preferred alternative that would be replaced.

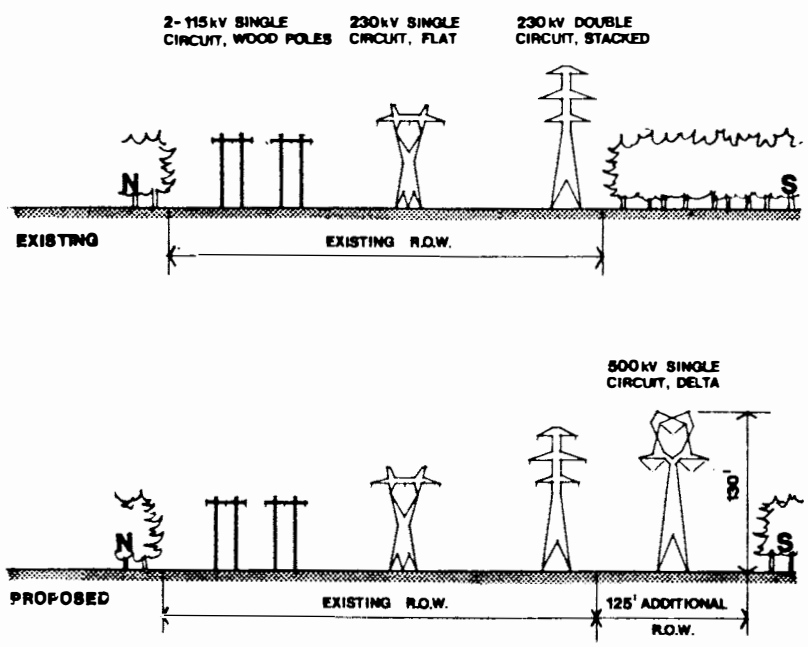


FIGURE 1-14 TYPICAL CORRIDORS FOR OPTION C (ALVEY-SPENCER)

The Alvey Substation yard is currently heavily developed and congested, but the 500 kV line could be accommodated at this point by employing a compressed gas-insulated circuit breaker instead of standard overhead equipment. The estimated cost of this option, including the terminal equipment at Alvey, is $3,010,000. This is $8,890,000 less than the portion of the draft preferred alternative that would not be expended at this time if this option is selected.

Option D - North Umpqua Highway Bypass

During preparation of the EIS, an option was identified that would substantially reduce visual impacts along the North Umpqua Highway. This option involves routing the proposed 500 kV line through the valley east of the North Umpqua Highway and parallel to an existing line in that valley. This alternative would eliminate that portion of the draft preferred alternative which parallels the existing lines which are adjacent to the North Umpqua Highway for several miles. This alternative is mapped in Figures 1-2 and 1-3 while Figure 1-15 illustrates the existing line along the route of Option D and the potential modifications to this corridor.

Although only preliminary engineering and cost studies are complete at this time, it is estimated that this option would be 5.1 miles long, requiring acquisition of 96 acres of additional right-of-way, construction of 2.5 miles of new access road and clearing of 5 acres. The cost of this option is estimated to be $2,434,000. Option D would be same length as the corresponding section of the draft preferred alternative, but the draft preferred alternative would not require any additional right-of-way or clearing. The cost of Option D is estimated to be $464,000 more than the corresponding section of the preferred alternative.

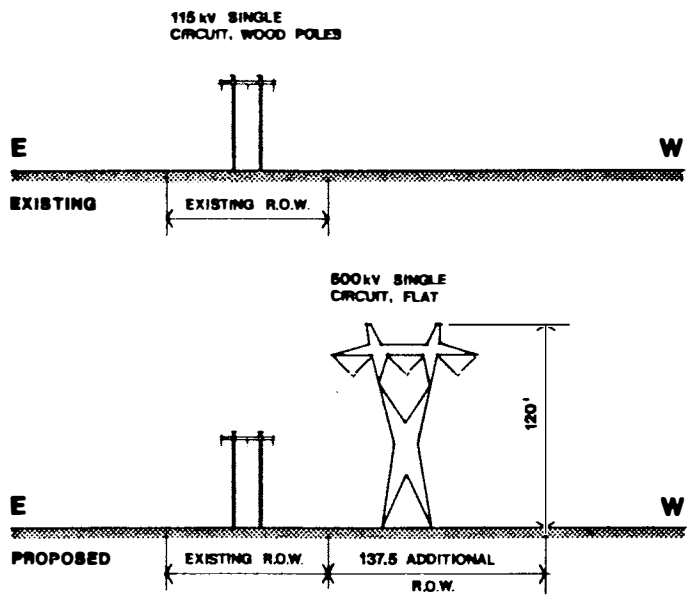


FIGURE 1-15 TYPICAL CORRIDORS FOR OPTION D (NORTH UMPQUA HIGHWAY BYPASS)

Option E - Canyonville (Existing Corridor)

Instead of deviating from the existing corridor near Canyonville as described for the draft preferred alternative, it would be possible to utilize the existing corridor. This option, replacing Line 54 near Canyonville, would be 4.2 miles long and would follow the route shown on Figure 1-3. It would be similar to the corridor depicted in Figure 1-8. It would require the acquisition of about 38 acres of additional right-of-way, construction of 0.8 miles of new access roads, and 22 acres of clearing. Option E would require the installation of several costly angle structures which increase the cost of this option substantially. The total cost of this option would be $2,323,000. As compared to the corresponding section of the draft preferred alternative, this option would be 1.5 miles longer and $921,000 more expensive. However, it would require 19 acres less new right-of-way, 19 fewer acres of clearing, and 7.3 fewer miles of roads.

Option F - Green Mountain (Existing Corridor)

Option F consists of an alignment along the existing corridor from just south of Cow Creek to Grave Creek, where the existing line skirts the western side of Green Mountain. The proposed and existing alignments in this area are mapped in Figure 1-3, while the configuration of the corridor for Option F would be similar to that shown in Figure 1-8. The total length of Option F would be 7.9 miles, compared to 6.9 miles for the section of new corridor in the preferred alternative which it would replace. This option would require 72 acres of additional right-of-way, 48 of which would be cleared, and 1.5 miles of new access roads. Compared to the draft preferred alternative, Option F would represent reductions of 74 acres of right-of-way, 57 acres of clearing, and 19.2 miles of new access roads. It would, however, require several costly angle structures. The construction cost of $3,579,000 would be about $452,000 more than the corresponding portion of the preferred alternative.

Option G - Evans Creek (Existing Corridor)

This option covers a third route segment where the proposed alignment deviates from the existing corridor. The draft preferred alternative would require 3.8 miles of new corridor southeast from the West Fork of Evans Creek, and a 0.5-mile replacement segment through Ramsey Canyon along the existing corridor. The appearance of the draft preferred corridor would be shown in Figure 1-9, while Option G would be similar to Figure 1-8. Option G would be slightly longer at 4.5 miles overall, and would require 40.9 acres of new right-of-way, 24.2 acres of clearing, and 0.7 miles of new access roads. In comparison, the corresponding segment of the draft preferred alternative would require 81 acres of right-of-way, 52 acres of clearing, and 10.1 miles of new access roads. It would also require several costly angle structures. The cost of Option G is estimated at $2,158,000, which is $159,000 more than for the proposed route segment.

As a result of findings by EFSC, a portion of "Option G" was combined with a portion of the draft preferred alternative in order to meet the EFSC standard. This new route option (Modified Option G) incorporates three (3) miles of the existing corridor and one and one half (1.5) miles of new alignment. Modified Option G would require an additional 59.1 acres of new right-of-way and 5.0 miles of new access road, and would cost $2,080,000. These requirements are more than those of Option G but less than those of the draft preferred alternative. The description of "Modified G" is as follows:

Beginning at an angle point on Line #54 in Section 15, Township 34 South, Range 3 West, W.M. Jackson County, Oregon; thence southeasterly in a generally straight line deviating from the existing corridor for a distance of approximately 1-1/2 miles before rejoining the existing corridor in Section 23, Township 34 South, Range 3 West, W.M., thence continuing along the existing corridor to Ramsay Canyon.

Option H - Medford Basin - West Route

Option H is a routing alternative which could be employed to reduce impacts in the Sams Valley area. This option would consist of replacing Line 54 for 1.3 miles near the West Fork of Evans Creek, and developing 10.9 miles of new corridor from this point south along the ridge between Sams Valley and Sardine Creek to Lyman Mountain. These two corridor situations would be similar to those depicted in Figures 1-8 and 1-10, respectively. From Lyman Mountain, the route would parallel an existing 115 kV line (Line 40) for 1.8 miles eastward to Table Rock Switching Station, which is similar to the situation shown in Figure 1-15.

The remaining 16.4 miles from Table Rock to Meridian Substation is common to both Options H and I. The 500 kV line would require additional right-of-way parallel to existing lines, except for a 3-mile segment between White City Substation and the White City Rifle Range, where single pole structures would be used within the existing right-of-way. Figure 1-16 most closely represents the situation in the parallel sections, although the sizes and number of existing lines vary in places, while Figure 1-17 depicts the section where single poles would be used for the 500 kV line.

The west route option was identified in the Routing Study Report as an option which avoided Sams Valley, yet utilized the existing corridor through White City. The alignment of the corridor along the ridge between Sardine Creek and Sams Valley was defined to minimize visual impacts yet provide sound, stable support for a line on this steep ridge. Visual and geotechnical concerns, however, could not be fully resolved until a decision causes completion of survey and design activities.

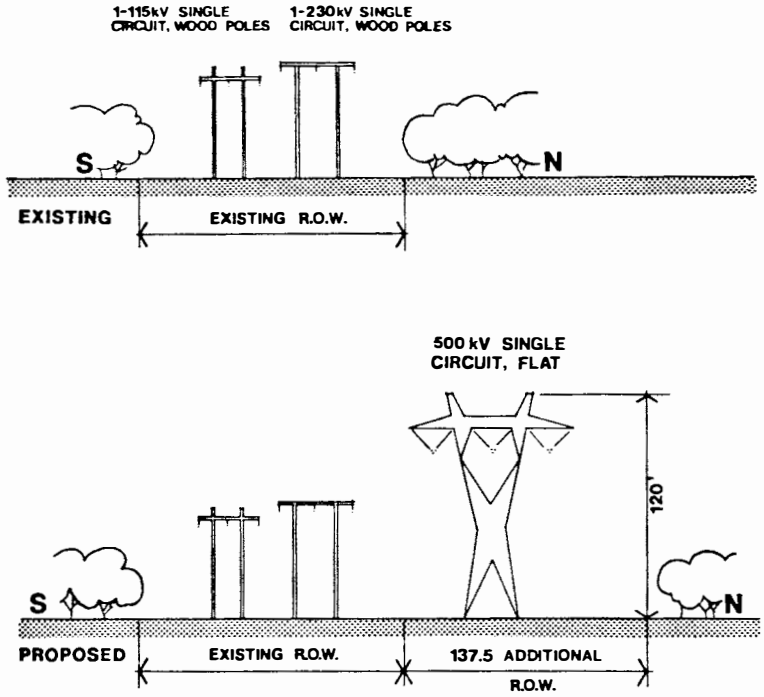


FIGURE 1-16 TYPICAL CORRIDORS FOR TABLE ROCK SWITCHING STATION - WHITE CITY SUBSTATION SECTION OF OPTIONS H AND I (MEDFORD BASIN WEST ROUTE AND EXISTING CORRIDOR)

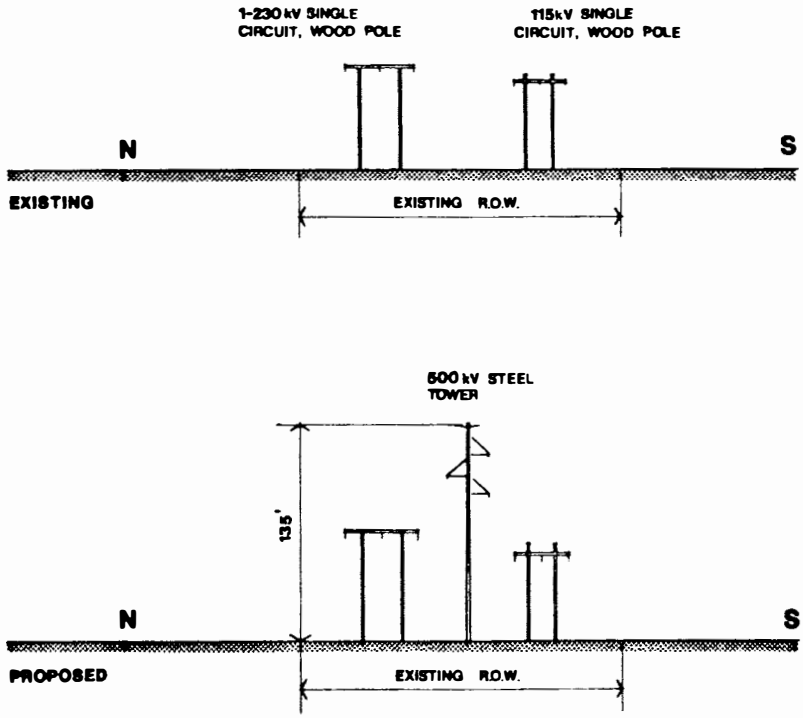


FIGURE 1-17 TYPICAL CORRIDORS FOR WHITE CITY SUBSTATION-WHITE CITY RIFLE RANGE SECTION OF OPTIONS H AND I (MEDFORD BASIN WEST ROUTE AND EXISTING CORRIDOR)

Although the exact location of the west route depends on final engineering studies, geotechnical reconnaissance studies have indicated that towers can be located securely on the slopes above Sardine Creek (Ferris 1982). In these locations the towers would not be visible from most of Sams Valley. This finding is incorporated into the subsequent impact analysis although it must be recognized that precise tower locations might deviate slightly from the corridor shown in the Routing Study Report.

Engineering and cost information for Option H is included in Table 1-3. The total length of this option would be 30.4 miles, which would be 0.9 miles shorter than the proposed route from the West Fork of Evans Creek to Meridian Substation. Option H would require approximately 503 acres of additional right-of-way, or 155 acres less than the corresponding portion of the draft preferred alternative. This option would also require 33.6 miles of new access road and 284 acres of additional clearing. This represents 37 miles and 140 acres less, respectively, when compared to the draft preferred proposed alternative. This option, however, would require several costly angle structures and would employ single pole structures (see Figure 1-17) which are much more costly than conventional lattice steel structures. This option would cost $16,062,000, or $1,156,000 more than the corresponding portion of the draft preferred alternative.

Option I - Medford Basin - Existing Corridor

The existing corridor through the Medford Basin could also be followed from Ramsey Canyon to Meridian Substation. This routing option has been incorporated into the new preferred alternative. This option would involve replacing Line 54 from Ramsey Canyon to Table Rock Switching Station, a distance of 7.8 miles. In the northern 4.8 miles of this section, the existing line would be replaced with steel lattice structures, as depicted in Figure 1-8. For the 3.0 miles immediately north of Table Rock Switching Station, however, single poles, shown in Figure 1-18, would be used. These poles would be used in this section (Sams Valley) because of congestion along the existing right-of-way.

From Table Rock Switching Station to Meridian Substation, Option I would be identical to Option H. In summary, Option I would be 27.3 miles long (from West Fork of Evans Creek), 2.8 miles shorter than the corresponding section of the draft preferred alternative. It would require about 351 acres of additional right-of-way, 12.0 miles of new access roads, and 183 acres of additional clearing. This is 281 acres of right-of-way, 58.6 miles of access roads, and 213 acres of clearing less than the draft preferred alternative. This option, like Option H, would require costly angle and single pole structures. The cost of Option I is $13,271,000, while the cost of the corresponding section of the draft preferred alternative is $12,907,000. These costs cannot be directly compared with those of Option H because the origin of I (Ramsey Canyon) is several miles south of the point where Option H leaves the existing corridor. In the comparison section all Medford Basin alternatives are assumed to start at a common point (West Fork Evans Creek).

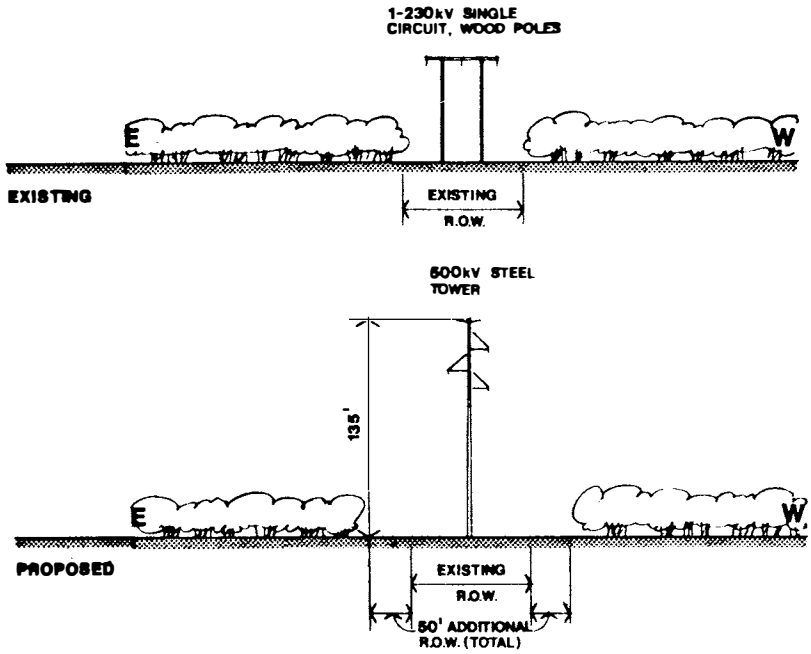


FIGURE 1-18 TYPICAL CORRIDORS FOR SAMS VALLEY PORTION OF RAMSEY CANYON-TABLE ROCK SWITCHING STATION SECTION OF OPTION I (MEDFORD BASIN EXISTING CORRIDOR)

Option J - Rogue River (Underwater Crossing)

Option J would consist of an underwater crossing of the Rogue River using buried cable, and could apply to the draft preferred alternative or to Options H or I. On the draft preferred (east) Medford Basin route, this option would require a 9,500-foot length of buried cable to avoid overhead line crossings of the Rogue River Road (west of the river), the river itself, and the Crater Lake Highway. The underground crossing would require 11 acres of new right-of-way, as opposed to 38 acres for the 1.8 miles of overhead line at this location of the preferred alternative. The cost of an underground crossing on the east route would be $6,892,000, resulting in a net increase in total project cost of about $6 million.

An underground crossing of the Rogue River along the existing corridor, as in Options H and I, would require 5,200 feet of buried cable. The required right-of-way area would be 6 acres, compared to 17 acres for an above-ground line. Total cost for this underground segment would be $4,865,000, which would increase the overall cost of the project by about $4.3 million.

The most prominent features associated with Option J would be the terminal structures to accommodate the transition between overhead and underground transmission modes. Typical drawings of these structures are shown in Figure 1-19.

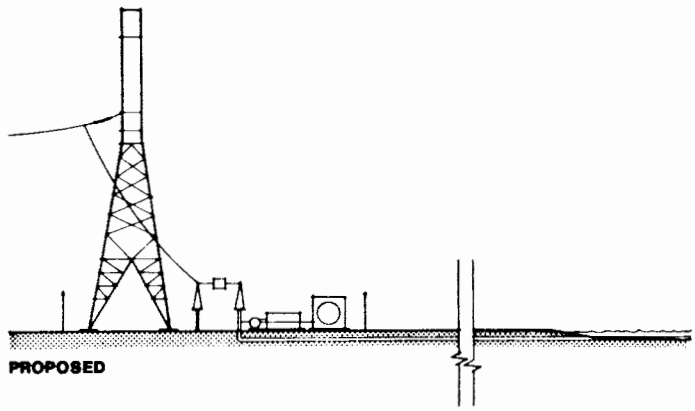


FIGURE 1-19 TYPICAL TERMINAL STRUCTURES FOR OPTION J (ROGUE RIVER UNDERWATER CROSSING)

Options K, L, and M - Medford Basin Ultimate Development Options

During the preparation of this Draft EIS it became apparent that a full comparison of options in the Medford area could not be undertaken without considering future transmission line requirements. The use of transmission line corridors for existing and future 500, 230, and 115 kV transmission lines warrants consideration so that these corridors can be optimally used in the future. As a result, three options have been identified which allow for long-term transmission requirements. These ultimate development options are designed to accommodate a future 500 kV transmission line if needed. Further, the ultimate development options using the existing corridor near Lower Table Rock and through White City would accommodate local transmission requirements as well as a future 500 kV line. Regardless of the route selected, however, Pacific estimates that an additional 50 feet of right-of-way would be required along the existing corridor to accommodate future 230 kV transmission requirements (Higgins 1982).

The manner of ultimate corridor development varies for each option in the Medford Basin, as described below. Options K, L, and M are the ultimate development options for the draft (east) preferred alternative, west, and existing corridors, respectively. All of these options, unlike Option I, begin at a common point (West Fork Evans Creek).

Option K - Medford Basin East Route Ultimate Development

The draft preferred alternative in the Medford Basin could be modified to accommodate future 500 kV transmission line development by acquiring a 300 foot easement for the new alignment portion, (30.8 miles) and a 200 foot easement for the half mile where Line 54 would be replaced. This width of right-of-way would support one 500 kV line and allow for a second Eugene-Medford line to be constructed in the future without the acquisition of additional right-of-way at that time. A total of 1132.1 acres of right-of-way would be acquired.

A single circuit 500 kV steel tower such as shown in Figure 1-10 would likely be used for each of the two 500 kV lines, but this design could change between now and the time the second line would be needed (estimated to be in the late 1990s to early 2000s). For the first line, no additional clearing or access road construction beyond the level described for the preferred alternative would be undertaken; in the future, adjacent clearing and new access roads would likely be required. Estimating these future activities is highly speculative because design and construction practices will probably change during the next twenty years. Because of this uncertainty, no sketches of the ultimate development are provided. Nevertheless, assumptions based on current practices can be used to project potential future access road and clearing requirements. It is thus estimated that up to 8.5 miles of new access road and 412 acres of clearing could be required at the time a second Eugene-Medford line would be built (see Table 1-3). These actitivies would be analyzed in detail prior to construction, in accordance with the laws at that time.

The cost of adopting this option, including the reserved right-of-way would be $15,636,000, or $730,000 more than the corresponding portion of the draft preferred alternative. It is approximately $11,122,000 less than the corresponding portion of the double circuit alternative.

Option L - Medford Basin West Route Ultimate Development

The ultimate development of the west route can be described in segments. Over most of the segment from West Fork Evans Creek to the junction of the West Route with the existing line near Lyman Mountain an easement for 300 feet of right-of-way would be obtained. This would accommodate two 500 kV lines although the second line would not be constructed until the 1990s or beyond, if required. Access road construction and clearing in this segment would be identical to Option H although additional road construction and clearing activity would likely occur with construction of the second line.

From Lyman Mountain, the new 500 kV line would parallel the existing 115 kV line on the north and east side for 4.7 miles past Table Rock Substation and across the Rogue River until the angle point south of the Medford Water Treatment Plant. Figure 1-20 shows typical corridors in this section. The new line would cross over the existing lines to the south side of the corridor at this point. It would then parallel

the existing lines through White City to the White City Rifle Range (also known as Jackson County Sports Park). Pacific would construct a single circuit line (and acquire an easement for a future line) south to Meridian Tap as shown in Figure 1-21. At Meridian Tap the line would cross the existing line again and parallel it on the north side to Meridian Substation. In this last segment of the route, an easement would also be acquired for a future 500 kV line.

This option would require the acquisition of 137.5 feet of additional right-of-way at present, but would allow for a future 500 kV transmission line within the existing corridor.

The total amount of right-of-way that would be required for this 30.4 mile option is 737.5 acres. This option is estimated to cost $22,582,000, $7,676,000 more and $4,176,000 less than the draft preferred and double circuit alternatives respectively. As indicated above, initial access requirements for this option would be the same as Option H, although a second Eugene-Medford line could require up to 5.4 miles of access roads and 261 acres of clearing, particularly near the northern and southern ends of the option.

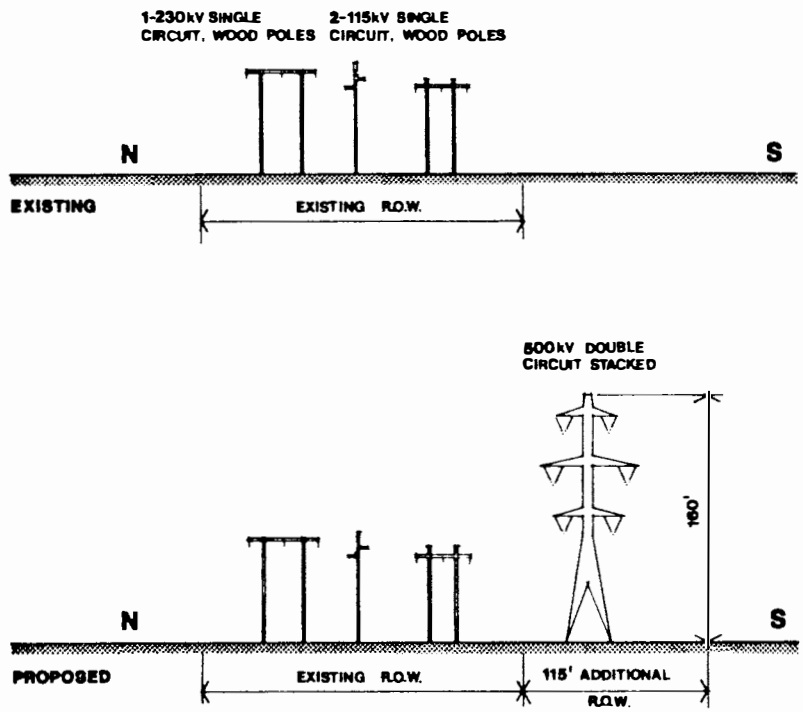


FIGURE 1-20 TYPICAL CORRIDORS FOR TABLE ROCK SWITCHING STATION-WHITE CITY RIFLE RANGE SECTION OF OPTIONS L AND M (MEDFORD BASIN WEST ROUTE AND EXISTING CORRIDOR ULTIMATE DEVELOPMENT)

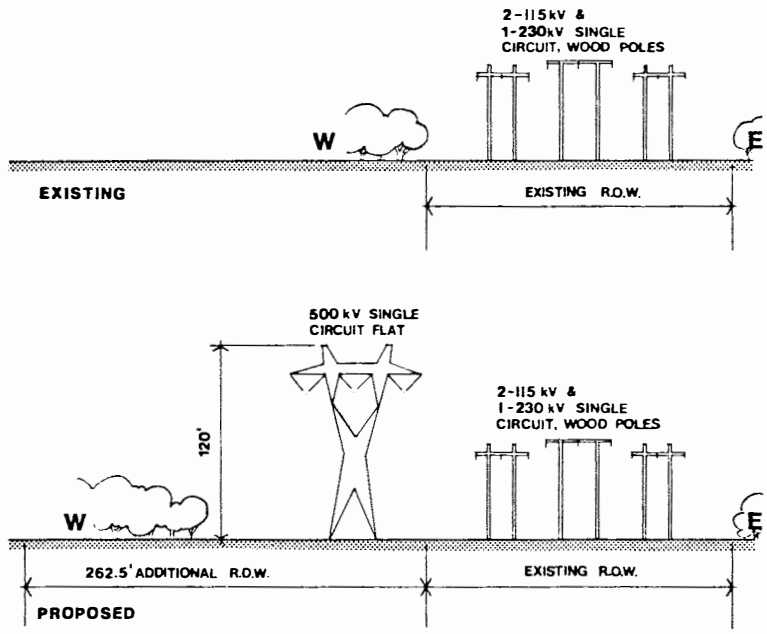


FIGURE 1-21 TYPICAL CORRIDORS FOR WHITE CITY RIFLE RANGE - MERIDIAN TAP SEGMENT OF OPTIONS L AND M (MEDFORD BASIN WEST ROUTE AND EXISTING CORRIDOR ULTIMATE DEVELOPMENT)

Option M - Medford Basin Existing Corridor Ultimate Development

From Ramsey Canyon to an angle point three miles north of Table Rock Substation, this option would involve replacing Pacific's existing Line 54 with a single circuit line similar to that shown in Figure 1-8. It would also involve acquisition of an additional 200 feet of right-of-way. Seventy-five of this 200 feet would be required for the first line, while acquisition of the remaining 125 feet would facilitate construction of a second Eugene-Medford 500 kV line in the future.

From the angle point described above through Sams Valley to Table Rock Substation, Pacific would construct double circuit structures to accommodate the proposed Eugene-Medford 500 kV line and the possible future line (see Figure 1-22). The actual width of new right-of-way to be acquired depends on the design of the double circuit structures selected, but in no case would it be more than 75 feet. From Table Rock Substation to Meridian Substation, Option M is identical to Option L.

Overall, this 28.5 mile option would require 469 acres of new right-of-way and 5 miles of new access. In addition, future development associated with a second Eugene-Medford line would require up to an additional 219 acres of clearing and 4.3 miles of access roads. It would cost $21,159,000, $6,253,000 more and $5,599,000 less than the corresponding portions of the draft preferred and double circuit alternatives respectively.

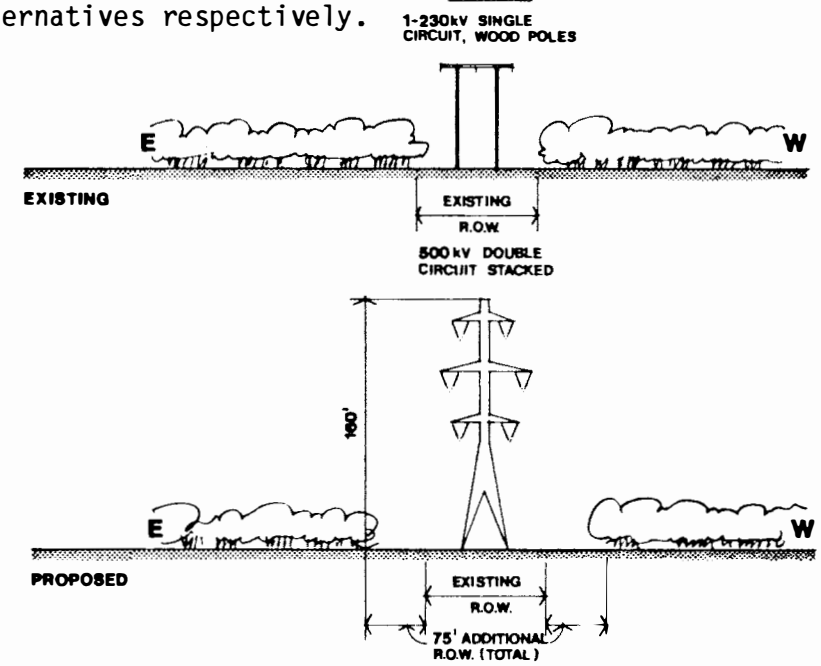


FIGURE 1-22 TYPICAL CORRIDORS FOR SAMS VALLEY PORTION OF RAMSEY CANYON-TABLE ROCK SWITCHING STATION SEGMENT OF OPTION M (MEDFORD BASIN EXISTING CORRIDOR ULTIMATE DEVELOPMENT)

ALTERNATIVES ELIMINATED FROM DETAILED DISCUSSION

Alternatives eliminated from detailed discussion in this EIS include several transmission and non-transmission alternatives. Such alternatives include: programs to reduce peak demands, local sources of generation, conservation, a double-circuit transmission line parallel to existing facilities, and a second Malin-Medford transmission line.

During the EIS scoping and initial EFSC hearings on this project, non-transmission alternatives including measures to reduce peak load demands (e.g. load management) and measures to develop local generation sources were identified as potential alternatives to the Eugene-Medford 500 kV transmission line. These non-transmission alternatives, including cogeneration, were determined to be insufficient to satisfy the need for this project by the EFSC (see Hearing Officer's Report and Recommendation and OAR 345-080-052).

Conservation was also identified as a potential alternative to the proposed project, but it was also determined to be insufficient to reduce energy demands by the magnitude required to eliminate the need for the proposed project. The forecasts compiled by Pacific and summarized in the discussion of the project's Purpose and Need include energy conservation measures in the residential, commercial, and industrial sectors of the economy, as well as conservation induced by increased real prices of energy. Were it not for these programs, peak loads in the forecasted period would have averaged 5 percent higher.

Development of an entirely new transmission corridor between Eugene and Medford was also identified during scoping. However, this alternative has been eliminated from detailed discussion because of: 1) the availability of an existing corridor; 2) increased environmental and economic costs associated with new right-of-way acquisition, increased tree removal, and access road development; 3) the identification of other options, which include the new corridor segments discussed in this EIS; and 4) Section 503 of the Federal Land Policy and Management Act, which encourages non-proliferation of utility corridors.

Construction of a double circuit transmission line parallel to the existing line was also identified as a transmission alternative. The effect of this alternative on renewable and non-renewable resources would be equivalent to a parallel single circuit line (increased right-of-way, access road construction, and clearing) which is discussed in this EIS. The effect on the visual environment would be greater than the double circuit alternative discussed in this EIS because existing lines would remain if a parallel double circuit line were to be built. The combined effect of a double circuit line parallel to existing lines on the physical and visual environment would be significantly greater than the other alternatives discussed in this EIS. Consequently, this alternative is not discussed further.

A second 500 kV transmission line between Malin and Medford, Oregon was also identified during the BLM and EFSC hearings as an alternative to a line from Eugene to Medford. Since these meetings, it has been determined that a second Malin-Medford line would not by itself meet the electrical needs of southern Oregon and northern California, nor improve the reliability of the regional transmission system.

There are two sets of reasons why the Malin-Medford alternative has been eliminated from detailed analysis. The first set relates to its ability to satisfy the project need as defined earlier, and the second set relates to the line's environmental impact.

From a transmission planning standpoint, there is insufficient transmission capacity available into Malin from the north or east to make the Malin-Medford option viable because the existing lines serving Malin from the north and east are committed to other uses. The most important use, as it relates to this project, is as part of the Pacific Northwest-Southwest AC Intertie (see Glossary). BPA was authorized by Congress to construct a major portion of the north end of the Intertie facilities to provide for the exchange of electric power between the

Northwest and Southwest. This authorization did not include use of the 500 kV facilities for service to local loads. Based on this authority, the priority for use of these facilities restricts availability of transmission capability to serve loads in southwest Oregon. As a consequence, Pacific is obligated to separate its 500 kV lines from the Northwest-Southwest Intertie at Malin when scheduling capability on the Intertie is reduced.

With a second line between Malin and Medford, this separation would result in two Malin-Medford lines being supported by Pacific's single 500 kV line from Malin to Summer Lake. This condition is unacceptable, since an outage of the Malin-Summer Lake transmission line would result in the loss of all support to both 500 kV lines into Medford, causing an extensive blackout in southern Oregon and northern California. The existence of these two lines within 150 feet of each other would also expose these lines to coincident failures, thereby creating the same results as a Malin-Summer Lake outage.

Another reason why a second Malin-Medford line would not, by itself, provide reliable electric service is that it would not strengthen the existing transmission system. The existing system and proposed Eugene-Medford line would provide back-up paths to serve all major load centers. These load centers include Portland, the Willamette Valley, southern Oregon/northern California, and central Oregon. A second line between Malin and Medford would not provide these back-up paths and so would not improve the regional transmission system reliability.

Therefore, to meet the needs of the proposed project, the Malin-Medford alternative would also require construction of a second Malin-Summer Lake 500 kV line (75 miles in length) and additional development at the Summer Lake Substation. It would also require construction of the 58 mile Eugene-Dixonville section of the proposed project or expansion of the existing 230 kV system initialy and again at a later date. The total cost of a second Malin-Medford 500 kV transmission line would exceed $119,000,000.

If the full extent of the Malin-Medford alternative is considered, the second set of reasons for eliminating it from detailed analysis in this EIS becomes apparent. The reasons relate to environmental impacts, which would be greater than for a Eugene-Medford line. The Malin-Medford alternative (including a second Malin-Summer Lake line and a Eugene-Dixonville line) would require over 220 miles of new transmission line, approximately 70 miles more than the draft preferred alternative. It would also require over 2600 acres of additional right-of-way, approximately twice as much as the draft preferred alternative. Although this line would not impact the Medford Basin, it would affect the northern part of the study area evaluated in this EIS and would have significant impacts in the Klamath Basin, both on residential and agricultural land use.

STANDARD DESIGN FEATURES

Information on project engineering considerations is found in the Pacific Power and Light Company Site Certificate Application to the State of Oregon Energy Facility Siting Council (Pacific 1981a). That application identifies design characteristics of the proposed transmission line. The proposed transmission line would be supported on steel towers, designed in conformance with the standards of the National Electric Safety Code. For a single circuit line, three 3-bundled conductors would be used. Each 3-bundled conductor carries 1 phase of the three phase AC single-circuit line. The towers would typically be 120 feet tall and weigh approximately 17,000 pounds. One foundation is required for each tower leg. In most sites each foundation would consist of a poured-in-place concrete pier footing averaging three feet in diameter and 14 feet in depth. Holes for these foundations would be excavated by auguring. Rock anchors would be installed in bedrock areas, and some blasting might be necessary in areas of fractured bedrock. Double circuit lines would consist of two sets of three-phase AC overhead conductors. Double circuit towers are typically 160 feet tall and weigh about 40,000 pounds.

Minimum conductor ground clearances would be maintained, including the standard clearance of 38 feet in most areas, 45 feet in areas where highways are crossed, 42 feet above cultivated land, and 55 feet above all railroad crossings. The average span length would be approximately 1200 feet, with an average of 4.3 structures per mile. Small diameter (less than one inch) wires would also be strung on the top of all towers. These overhead ground wires shield the line from lightning strikes, providing protection to the transmission system.

Towers and conductors would be located and designed to minimize visual impacts. Careful tower siting, clearing, and establishment of buffer strips would be undertaken to lower impacts. Both the BLM and EFSC, or other agencies designated by EFSC, would have the authority to review design studies and specify project changes. Non-reflective conductors would be used between Spencer Switching Station and Canyonville and in the Medford Basin. Towers near the North Umpqua River and Highway, and in the Medford Basin would be treated to dull the finish of the steel. The project would also include designation of a special vegetation management zone near the selected Rogue River crossing. In this zone a vegetation planting program would be employed which would lead to establishment of a vegetation screen of native shrubs along the river bank.

The transmission line would be located within a right-of-way for which an easement or title would be owned by either BPA (in the sections west or east of Spencer Switching Station) or Pacific (for those sections from Spencer Switching Station south to Medford). Ownership of these rights-of-way would be accomplished through the acquisition of new easements or the utilization of existing rights-of-way currently held by BPA and Pacific. Up to 175 feet of right-of-way would be obtained in areas where a new right-of-way is required. In areas where the

proposed line would parallel or replace an existing line, additional right-of-way requirements would range from 0 to 175 feet as reported in Tables 1-2 and 1-3.

In the new alignment areas of the preferred and other alternatives between Canyonville and Ramsey Canyon (Canyonville, Green Mountain, and West Fork Evans Creek) described earlier, Pacific would remove Line 54 and construct the new line on a new right-of-way. On the sections of the existing line replaced by the Green Mountain and West Fork Evans Creek segments, Pacific would relinquish its easement on abandoned rights-of-way allowing them to be used for forestry or other purposes. Easements would also be relinquished on all but the first two miles of the existing corridor to be replaced by the Canyonville re-route. The easement would be retained in the first two-mile segment to accommodate a future line to Grants Pass.

Surface access to each tower is normally provided by both BPA and Pacific. Existing access could be utilized in large part for those segments of alternatives which parallel or replace existing lines. In other areas, new access roads would be constructed to provide access to tower sites. New access requirements would range from 150 feet per mile to over 3 miles of access road per mile of transmission line depending on the existing road network, topography, and the location of individual towers. A large, but presently unknown portion of the existing road network would require upgrading. This would involve clearing overgrown vegetation and regrading. Generally, the access roads would have a 14-foot wide subgrade.

CONSTRUCTION

Transmission line construction activities are described in the Pacific Power and Light Site Certificate Application (Pacific 1981a) and BPA programmatic environmental impact statements (USDOE BPA 1980a; USDI BPA 1977b). These activities would include clearing, access construction, tower assembly, erection, conductor stringing, and tensioning. All involve the operation of heavy equipment. Site restoration activities which occur following construction include scarification, reseeding, weed control, and other activities as required.

Clearing affects more acreage than other construction activities. The intent behind BPA's and Pacific's vegetation management programs would be to allow as much vegetation to remain on the right-of-way as possible. The extent of vegetation remaining would depend on the type of plants present, their current and projected heights and the distances needed to maintain safe clearances as defined by the National Electric Safety Code. These factors would be analyzed prior to clearing activities to identify only that vegetation which need be removed. Although the exact clearing procedures would vary somewhat, each utility would remove only that vegetation which would pose a threat to the transmission line. For example, clearing would be minimal in areas of low growing shrubs. Clearing would be much more extensive in areas of large old growth timber, as trees further from

the line could potentially fall into the transmission line towers or conductors. For the purpose of analyzing impacts in this EIS it is assumed that the average clearing width on a 175-foot right-of-way would be a 125 foot wide strip.

Both BPA and Pacific have identified specific actions that would be implemented to reduce construction impacts. BPA has incorporated measures designed to maintain environmental quality into its construction specifications (USDOE BPA 1978). Standard design techniques such as installing gates in cooperation with affected landowners and noise control in residential areas are included in these specifications. These gates are also used in limiting access during the line's operation. Activities to minimize environmental impacts have also been identified for the portion of the line that would be constructed by Pacific and are presented in Appendix A. Appendix A includes letters from Pacific to the Bureau of Land Management outlining specific activities it would undertake on federal land. In accordance with conditions which would be specified by the Energy Facility Siting Council, similar measures would be employed on non-federal land.

The proposed project would include measures to minimize impacts in specific locations and during certain periods of the year. For example, construction activities would not occur when weather or other conditions increase potential environmental impacts to unacceptable levels as determined by BLM and designated Oregon State agencies. Such conditions could arise during heavy rains or when the ground is thawing. To prevent impacts during such periods, BLM would restrict construction activities on lands it manages. Conditions in EFSC's site certificate and other state laws would give EFSC and other state agencies the authority to restrict construction on state and private lands during the same periods.

MAINTENANCE

Transmission right-of-way maintenance would require periodic control of tall vegetation so that it will not fall into conductors or otherwise interfere with the operation of the line, while encouraging or promoting the growth of low growing species of vegetation. Additional information on Pacific's vegetation management program is presented in the pamphlet entitled, "Pacific Power and Light Company Policy on Transmission Line Rights-of-Way." BPA practices are described in the Environmental Assessment on BPA's Fiscal Year 1982 Vegetation Management Program (USDOE BPA 1981a) and the Fiscal Year 1981 Program EIS (USDOE BPA 1980a).

Use of herbicides would be an integral part of both Pacific's and BPA's vegetation management programs on rights-of-way. The underlying need of the management program would be to ensure reliable continued service of the transmission system. Various techniques would be utilized to control or eliminate vegetation growing within or adjacent to

transmission facilities that could interfere with reliable service. These techniques would include hand and mechanical cutting of vegetation as well as the selective and, in the case of BPA, aerial application of herbicides. In areas where herbicides would be used, applications would occur at approximately 10-year intervals.

The methods employed would depend on a number of site-specific variables. Consideration would be given to the management objective, type of vegetation present, adjacent land use and development, and impacts of the control technique when selecting the most appropriate method to employ at a specific facility or right-of-way segment.

In a substation yard where access would be restricted, the hazard of exposure to humans would be minimal and the objective would be to eliminate all vegetation, a herbicide would be used. On rights-of way, where the greatest selectivity would be desired, handcutting of specific trees and stump treatment would likely be utilized. On rights-of way where selectivity would still be desirable, access would not be a problem and herbicide use would present little hazard, selective means of herbicide application such as foliage, basal and soil treatment, as well as the frill, notch and cup methods would likely be employed. Finally, on rights-of-way where selectivity would not be a factor, access would be a problem, and herbicide use would present little hazard, BPA might consider aerial application of herbicides to be appropriate. Aerial spraying is usually done on areas with few roads or where control of uniform stands of conifers or other tall vegetation makes selectivity unnecessary. This flexibility in vegetation management would introduce a minimal amount of herbicides into the environment and greatly reduce the potential for hazardous exposure.

When herbicides would be employed, they would be applied under close supervision. Where applied by contractors, BPA or Pacific inspection would be exercised. All herbicides would be applied at rates specified on the product label except where rates lower than specified have proven effective. Rates higher than those specified on the product label would never be used. All Pacific and BPA applications (whether undertaken by themselves or by contractors) would be conducted or under the supervision of applicators licensed by the State of Oregon. Pacific and BPA would also coordinate closely with agencies responsible for herbicide use, such as the State of Oregon Pesticide Use Clearinghouse. Only herbicides registered with the Environmental Protection Agency (EPA) would be used.

If a landowner objects to Pacific or BPA vegetation management methods, either organization may join in a Tree and Brush Agreement allowing the owner to assume responsibility for the vegetation on the right-of-way. Benefits associated with such an agreement and the multiple use of Pacific and BPA rights-of-way are: (1) more productive use of the right-of-way land, (2) reduction of maintenance costs and time, and (3) reduction of herbicide use.

The use of certain chemicals would be controlled under the Federal Insecticide, Fungicide and Rodenticide Act. The EPA sets regulations for enforcement of this act (40 CFR, Part 162), as well as acceptance of certain pesticides and their use, storage, and disposal (40 CFR, Part 165). In addition, EPA sets protection standards for workers handling such pesticides (40 CFR, Part 170). Both BPA and Pacific would comply with all regulations pertaining to insecticides, fungicides, and rodenticides used in its construction and maintenance activities. Chapter V of the BPA Right-of-Way Management Standards (No. 63040-50) details the various procedures and practices used by BPA in order to comply with various federal regulations. A detailed discussion of herbicide and pesticide use by BPA is contained in the Fiscal Year 1981 Program EIS (USDOE BPA 1980a). All herbicide use on lands administered by BLM is subject to prior approval by BLM.

COMPARISON OF ALTERNATIVES

The alternatives and options are compared in relation to two sets of parameters. First, the success of each alternative in achieving the purpose of the project at a reasonable cost is assessed. Second, the environmental impacts of the alternatives and options are compared. The evaluations are made by comparing all of the alternatives to each other, while options are evaluated by comparing each option to the corresponding portion of the draft preferred alternative or other alternatives, where appropriate. Chapter 3 provides more detailed information on comparisons made in this chapter.

PROJECT INTENT

As described in the discussion of Purpose and Need, the proposed Pacific Eugene-Medford 500 kV transmission line is intended to serve anticipated loads in southwestern Oregon and northern California while also improving the reliability of the transmission system.

Effective project planning requires anticipating future needs and making decisions accordingly. One such consideration relates to the requirement for a second Eugene-Medford 500 kV line. Both BPA (Perry 1981) and Pacific (Higgins 1981a) have indicated that a second Eugene-Medford 500 kV line may be required. Considerable uncertainty surrounds the timing for this line, however. BPA indicates that this line would be required for the 1990s while Pacific believes it would not be required until after the year 2000. The timing for this line depends on factors which are difficult to predict, such as future load growth and development of future generation resources. Regardless of when the second Eugene-Medford line is required, its possible routing is an important consideration in evaluating the alternatives and options for the first Eugene-Medford 500 kV line.

As to the BPA activities between Lane and Spencer, a double circuit, 500 kV configuration is being proposed, regardless of the alternatives considered by Pacific. Two circuits on one tower would reduce the need, sometimes completely, for any new right-of-way on the Bonneville alignment. This is especially a concern between the Twin Oaks and Spencer areas where extensive development has taken place adjacent to the existing right-of-way. Although some new right-of-way is required between Twin Oaks and Lane, the proposed configuration would allow for more efficient utilization of the corridor in the future.

Also related to the requirement for a second line from Eugene to Medford is the goal of planning for and using transmission line corridors as efficiently as possible. This goal is shared by BLM as mandated in the Federal Land Policy and Management Act (Sec. 503), BPA as stated in its Role EIS (USDI BPA 1977a), and by the State of Oregon through its Statewide Planning Goals and Guidelines. Thus, the potential use of existing and designated corridors for future transmission lines is a factor to consider in evaluating transmission line corridors.

Alternatives

The draft and new preferred, parallel, and double circuit alternatives would satisfy the purpose and needs identified on page 1-1. There are, however, differences between these alternatives related to the extent each alternative achieves the project's purpose.

Draft Preferred Alternative: The draft preferred alternative would adequately meet the project's need, although it would not fully satisfy all projected long-term requirements. If this line is constructed, there could likely be a need for a second Eugene-Medford 500 kV line in the future. Perry (1981) estimates this second Eugene-Medford line would be needed in the 1990s, but this conclusion is uncertain . This alternative satisfies all the project's needs and is estimated to cost approximately $69.2 million, less than the parallel or double circuit alternatives.

In the longer term, replacing the existing line (Line 54) between Canyonville and Ramsey Canyon does not allow for future transmission line development within existing rights-of-way. As compared to the segment between Spencer Switching Station and Canyonville where the proposed line would replace one of two existing transmission lines, in the segment from Canyonville to Ramsey Canyon the only existing line would be replaced (see Figure 1-8). As a result, any future lines between Canyonville and Ramsey Canyon could not be built on existing right-of-way.

Alternative 1, No Action Alternative: Adoption of the no action alternative would require that a program be developed to shed loads if demand grows as anticipated and no additional transmission capacity is

provided to the area. In addition, the reliability of service to the area would not be maintained under the no action alternative. The result would be an increased chance of outages to customers in southern Oregon and northern California when existing lines are overloaded or are unexpectedly taken out of service, such as when high winds damage existing facilities.

The extent to which loads would be dropped or service reduced is difficult to estimate. Barring weather-induced situations, problems would not occur until the mid-1980s and then only during periods of peak demand. Such demand peaks typically occur during cold periods in the winter or hot periods in the summer, when consumption of electricity for heating or cooling is high. The chance of dropping service to customers during such periods would be increased if the no action alternative is adopted. The customers to whom service would be reduced or eliminated are not known, but service to large industrial customers is typically dropped first. Detailed studies of load shedding which would occur if this project is not built were not conducted, but load shedding would probably be handled in a manner consistent with Oregon PUC Order No. 33 on actions taken by Pacific to conserve energy at times of deficiency of resources. Although it is difficult to quantitatively estimate the potential for outages, it is reasonable to conclude that the chances of service disruption markedly increase in 1986, and worsen thereafter.

In addition to the transmission system considerations outlined above, adoption of this alternative would not strengthen BPA's service to the Eugene area. Thus, outages in Eugene could occur, or at least would be more likely to occur, if the no action alternative is adopted.

In summary, the no action alternative would not satisfy the project's need. Instead, it would reduce the quality of electric service to southern Oregon and northern California in the mid 1980s and beyond.

Alternative 2, Parallel Alternative: The parallel alternative would provide more transmission capacity to the subregion than the draft or new preferred alternative because this alternative would allow the existing 230 kV system to be left intact. Leaving the 230 kV transmission system in place has two advantages. First, it provides redundancy to the transmission system upon completion of the project. Second, it allows for converting the existing 230 kV system to 500 kV in the future, thereby facilitating the ultimate establishment of two 500 kV lines between Eugene and Medford.

The cost of the parallel alternative would be approximately $74.6 million, which is about $5.4 million more than the draft preferred alternative and $14 million more than the new preferred alternative. This incremental cost is much less than that for the double circuit alternative, and might be justified if only electrical system planning considerations influenced the alternative selection process.

Alternative 3, Double Circuit Alternative: The double circuit alternative would provide the most transmission capacity in the existing corridor. It would satisfy both the short-term need and long-term requirements. This alternative would cost approximately $121.6 million, or $52.4 million more than the draft preferred alternative and $61 million more than the new preferred alternative, but would require no additional future land investment if a second 500 kV line were constructed.

Alternative 4, New Preferred Alternative: The performance of Alternative 4 in meeting the project intent would be very similar to that of the draft preferred alternative. This alternative would adequately meet the present need for expanded, reliable transmission capacity, and would cost approximately $8.6 million less than the draft preferred alternative. Alternative 4 would not provide for future expansion of transmission capacity between Eugene and Medford, as would Alternative 2 or 3. This alternative would also result in the construction of only 2 miles of the 13.5-mile Alvey-Lane link, while the other construction alternatives would provide 11.5 miles of line within this longer-term facility need.

Options

Little difference exists between Options D, E, F, G, and J and the preferred alternative as related to the project's purpose. In the discussion that follows, only options where a difference exists are discussed.

Option A involves removal of BPA's existing 230 kV line between Lane Substation and Spencer Switching Station and replacing it with a double circuit 500 kV line. It is estimated this option would cost $6,900,000, $400,000 less than the draft preferred alternative. Option A would not require new right-of-way between Twin Oaks and Lane, which is the reason for the estimated cost difference. It is being considered primarily for environmental reasons, but has drawbacks from a system planning perspective because it requires the removal of the existing 230 kV line from service. The 230 kV line interconnects the Lane and Alvey Substations, balancing the electrical load between them. This is especially critical when the 500/230 kV transformers at Lane or Alvey are out-of-service. For this reason, the 230 kV Alvey-Lane line must remain in service after the Eugene-Medford transmission line is constructed.

Option B would involve bypassing the existing right-of-way south of Eugene and creating a new corridor between Twin Oaks and Camas Swale. Switches and other equipment for the new line would be installed in the existing Lane Substation. To satisfy BPA's future needs to complete a 500 kV loop around Eugene, when the second Eugene-Medford 500 kV line would be needed, a new 500 kV line would have to be built between Camas Swale and Alvey. Impacts of this construction would be addressed when a firm construction proposal is developed. Even though the future 500 kV loop would be completed, Option B does not efficiently satisfy this long-term need.

Option C (part of the new preferred alternative) involves terminating the line at Alvey Substation instead of Lane Substation. This option would reduce the overall length of the project by 9.5 miles and would cost approximately $3,010,000, which is $8,890,000 less than the draft preferred alternative. Although considerably shorter and estimated to cost less, Option C has inherent problems due to the physical space limitation at Alvey. A gas-insulated circuit breaker would be required to terminate the line at Alvey. The Lane Substation presently has sufficient space within the yard to accommodate all the needed switches and equipment. In addition, BPA has identified the need for a future transmission line between Lane and Alvey, so that connecting the Eugene-Medford line into Alvey would merely delay, not eliminate, the need for a line between Lane Substation and Spencer Switching Station.

Options H and I (the latter of which is included in the new preferred alternative) would involve constructing lines within or adjacent to existing transmission corridors near Medford. In these options, as described earlier, some lines would be replaced while others would be paralleled for most effective use of existing corridors. If this approach is adopted, the potential use of these corridors for 230 or 115 kV local transmission lines is reduced. Thus, more costly design options (e.g., single pole structures) or new corridors would need to be considered for future transmission lines in the Medford area. This problem is most pronounced in White City, where urban development adjacent to the existing corridor limits potential for future transmission line development. It is of less concern in Sams Valley, where the existing right-of-way is narrower and less likely to be expanded for future lines. Concerns related to foreclosing the use of existing corridors for future transmission line development led to the identifiction of the ultimate development options in the Medford Basin. The ultimate development options could accommodate future transmission line development more readily than either Option H or I.

Options K, L, and M would satisfy the existing need and future requirements of the region. Each of these options would be superior, in terms of meeting future requirements, to either the preferred or parallel alternatives or any of the options in the Medford Basin because each option could accommodate a 500 kV line and local transmission lines in existing corridors. These options, particularly Options L and M, would also cost substantially more than the other plans corresponding to these routes. The cost of Option K would be $15,636,000 or $730,000 more than the corresponding portion of the draft preferred alternative. Option L would be $6,520,000 more expensive than Option H, while Option M would cost $5,889,000 more than Option I. Of the three Medford Basin ultimate development options, Options L and M would have a drawback in that locating all major transmission lines (500 kV and 230 kV) in one corridor would increase

the chance of coincident failure of multiple lines and the consequences should coincident failure occur. The problem would be most acute where one line crosses over several others, but would be generally greater when all lines are located close together.

ENVIRONMENTAL COMPARISON

The environmental comparison of the alternatives is presented in Table 1-4. Detailed explanations of the impacts are described in Chapter 3 for each resource. The no action alternative is not included in Table 1-4 because impacts associated with it are minimal, except for potential social and economic impacts which are speculative but negative in relation to anticipated future load growth.

Alternative 4, the new preferred alternative, has been added to Table 1-4 to indicate the relative difference in impacts that would result from adoption of this alternative. As stated previously, this alternative involves substituting Options C, I and modified Option G for the corresponding portions of the draft preferred alternative. Because these substitute segments are analyzed in detail, a separate impact analysis of Alternative 4 is not carried throughout the document to avoid repetition. Net differences between Alternative 4 and the other alternatives are apparent from Table 1-4, while the effect of the substitute segments can be seen by comparing Options C and I to the corresponding portions of the draft preferred alternative.

The options are compared in Tables 1-5 and 1-6. Table 1-5 presents a comparison of Options A through G with the corresponding portions of the draft preferred alternative. This approach facilitates a direct comparison with the draft preferred alternative which also serves as an analytical benchmark. Table 1-6 provides the same comparisons for the options in the Medford Basin (Options H, I, K, L, and M). Topics listed in the tables correspond with those in the text, except that the tables do not include data on cultural resources. Detailed field studies of cultural resources were only conducted on certain segments of the preferred route; further studies will be conducted in additional areas, as noted in Chapter 3 and Appendix A. Option J is also not included in the table because the unique requirements of an underground transmission line river crossing do not facilitate a tabular comparison with other options.

Impacts have been quantified and their significance assessed where possible. The terms high, moderate, and insignificant have been used, applying criteria (context and intensity) identified by the Council on Environmental Quality (CEQ) to categorize the significance of impacts. Determinations of significance are presented in Chapter 3 and summarized in Tables 1-4, 1-5 and 1-6. The level of significance for those impacts which can be quantified is determined by considering the context and intensity of impacts as described in Chapter 3 for each resource category. A brief, narrative comparison of significant

TABLE 1-4
COMPARISON OF ALTERNATIVES

Areas of Investigation	Impact Parameters	Summary of Potential Impacts by Alternatives: Draft Preferred Alternative	Alternative 2 Parallel	Alternative 3 Double Circuit	**Alternative 4 New Preferred Alternative**
General	Corridor length (miles)	146.8	146.8	146.8	**135.2**
	Area of new right-of-way (ac)	1,322.7	2,543.4	1,322.7	**936.5**
	New Access Roads (miles)	118.0	129.6	118.0	**52.6**
Soils	Level of Impact	I	I	I	**I**
	Approximate soil loss (tons/year)	5,400	5,900	5,400	**3,620**
Water Resources	West Fork Evans Creek	M	M	M	**M**
	Remainder of Route	I	I	I	**I**
Vegetation	Level of Impact	I	I	I	**I**
	Vegetation Clearing (ac)				
	Access Roads -Grassland	13	16	13	**7**
	(All Vegetation -Forest	185	202	185	**81**
	Cleared) -Riparian/Wetland	2	2	2	**1-2**
	Right-of-Way -Forest	790	1,539	790	**532**
	(Tall Vegetation -Riparian/Wetland				
	Cleared)	12	17	12	**7**
	Candidate Threatened or Endangered Plant Occurrence (no. known sites)	2	2	2	**3**
Wildlife	Level of Impact	M	M	M	**I**
	Habitat Modification (ac)	See Vegetation	See Vegetation	See Vegetation	**See Vegetation**
	Length of New Access Roads Along New Corridor Alignment (miles)	102.5	102.5	102.5	**33.3**
	Columbian White-tailed Deer Effects	I	I	I	**I**
	Crucial Deer Winter Range				
	New Cleared R/W (ac)	87	128	87	**39**
	New Access Roads (miles)	10.4	11.2	10.4	**1.0**
	Waterfowl Collision Mortality Level	I	I	I	**I**
	Old-growth Habitat Reduction (ac)	37	38	37	**36**
	Salmonid Sedimentation Impacts				
	West Fork Evans Creek	M	M	M	**M**
	Remainder of Route	I	I	I	**I**
Cultural Resources	Level of Impact	I	I	I	**I**
Recreation Resources	High Recreation Impact Areas	0	0	0	**0**
	Moderate Recreation Impact Areas	4	4	5	**1**
Visual Resources	High Visual Impact Areas	2	3	4	**0**
	Moderate Visual Impact Areas	2	1	6	**1**
Land Use	Commercial/Industrial Uses				
	High Impact Areas	0	0	0	**0**
	Moderate Impact Areas	0	0	0	**0**
	Residential Land Use				
	High Impact Areas	1	1	1	**0**
	Moderate Impact Areas	1	4	4	**1**
	Permanently affected acreage of prime agricultural soils	1	2	1	**0.5**
	Additional right-of-way acreage on prime agricultural soils	30	170	30	**7**
	Temporarily disturbed acreage of Agricultural Soils	26	33	26	**13**
	Permanently affected acreage of classified commercial forest lands	459	1,238	459	**363**
	Towers in floodplain	5	5	5	**5**
Economic Conditions	Level of Impact	I	I	I	**I**
	Permanent loss of timber production (MBF/yr)	207.2	647.6	207.2	**170.2**
	Value of lost production approximate ($/yr)	$46,600	$145,700	$46,600	**$38,300**
	Lost timber employment (number of jobs)	1.3	4.0	1.3	**1.3**
	Total Construction Payroll (millions of dollars)	12.8	12.8	19.0	**11.2**
Social Conditions	Dwelling units within 1000 feet of line right-of-way				
	Houses	330-380	330-380	330-380	**220-250**
	Apartments	230-290	230-290	230-290	**0**

LEVEL OF IMPACT: I = INSIGNIFICANT IMPACT, M = MODERATELY SIGNIFICANT IMPACT, H = HIGHLY SIGNIFICANT IMPACT

TABLE 1-5
COMPARISON OF OPTIONS A-G

Areas of Investigation	Impact Parameters	Lane Twin Oaks Replacement Option A	**Draft** Preferred Alternative Corresponding Portion	Option B,	**Draft** Preferred Alternative Corresponding Portion	Alvey-Spencer Option[1]	**Draft** Preferred Alternative Corresponding Portion	North Umpqua Highway Bypass Option D	**Draft** Preferred Alternative Corresponding Portion	Option E, Canyonville Existing Corridor	**Draft** Preferred Alternative Corresponding Portion	Option F, Green Mt. Existing Corridor	**Draft** Preferred Alternative Corresponding Portion	Option G, West Fork Evans Creek Existing Corridor	**Draft** Preferred Alternative Corresponding Portion	**Modified Option G West Fork Evans Creek New and Existing Corridor**
General	Corridor length (miles)	7.5	7.5	14.2	16.3	2.0	11.5	5.1	5.1	4.2	2.7	7.9	6.9	4.5	3.8	**4.5**
	Area of new right-of-way (Ac)	0	106	259	137	30	114	96	0	38	57	72	146	41	81	**59.1**
	New Access Roads (miles)	0.9	1.6	18.3	3.0	0.6	2.3	2.5	0.6	0.8	8.1	1.5	20.7	0.7	10.1	**5.0**
Soils	Level of Impact	I	I	I	I	I	I	I	I	I	I	I	I	I	I	**I**
	Approximate soil loss (tons/yr)	50	70	400	240	50	120	100	60	60	230	110	590	60	290	**150**
Water Resources	Level of Impact	I	I	I	I	I	I	I	I	I	I	I	I	I	I	**I**
Vegetation	Level of Impact	I	I	I	I	I	I	I	I	I	I	I	I	I	I	**I**
	Vegetation Clearing (Ac)															
	Access Roads -Grassland	1	1	5	2	<1	1	4	1	<1	0	0	0	0	0	**0**
	(All Vegetation -Forest	1	2	26	3	1	3	<1	<1	1	14	2	18	1	17	**7**
	Cleared) -Riparian/Wetland	0	0	<1	<1	0	0	0	0	0	0	0	0	<1	<1	**<1**
	Right-of-Way -Forest	0	47	133	53	16	47	4	0	22	41	48	104	24	50	**36**
	(Tall Vegetation -Riparian/Wetland	0	0	<1	0	0	0	0	0	0	0	0	0	1	2	**1**
	Cleared)															
	Candidate Threatened or Endangered Plant Occurrence (no. known sites)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Wildlife	Level of Impact	I	I	I	I	I	I	I	I	I	I	I	I	I	I	**I**
	Habitat Modification (ac)	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	**see Vegetation**
	Length of New Access Roads Along New Corridor Alignments (miles)	0	0	1.67	0	0	0	1.5	0	0	8.1	0	20.7	0	10.1	**4.5**
	Columbian White-tailed Deer Effects	None	None	None	None	None	None	I	I	None	None	None	None	None	None	**None**
	Crucial Deer Winter Range															
	New Cleared R/W (Ac)	0	0	0	0	0	0	0	0	0	0	0	0	12	20	**16**
	New Access Roads (Miles)	0	0	0	0	0	0	0	0	0	0	0	0	0.4	3.9	**1.8**
	Waterfowl Collision Mortality Level	I	I	I	I	I	I	I	I	I	I	I	I	I	I	**I**
	Old-growth Habitat Reduction (ac)	0	0	0	0	0	0	0	0	9	14	3	8	2	4	**3**
	Salmonid Sedimentation Impacts	I	I	I	I	I	I	I	I	I	I	I	I	I	I	**I**
Cultural Resources	Level of Impact	I	I	I	I	I	I	I	I	I	I	I	I	I	I	**I**
Recreation Resources	High Recreation Impact Areas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	Moderate Recreation Impact Areas	0	0	0	1	0	1	0	0	0	0	0	0	0	0	**0**
Visual Resources	High Visual Impact Areas	0	0	0	1	0	1	0	0	1	0	0	0	0	0	**0**
	Moderate Visual Impact Areas	0	0	0	0	0	0	0	1	0	0	0	0	0	0	**0**
Land Use	Commercial/industrial uses															
	High impact areas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	Moderate impact areas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
	Residential land use															
	High impact areas	0	0	0	1	0	1	0	0	0	0	0	0	0	0	**0**
	Moderate impact areas	0	0	1	0	0	0	0	0	0	0	0	0	0	0	**0**
	Permanently affected acreage of prime agricultural soils	0	0	<0.5	0.5	0	0.5	0	0	0	0	0	0	0	0	**0**
	Additional right-of-way acreage on prime agricultural soils	0	0	32	9	0	6	0	0	0	0	0	0	0	0	**0**
	Temporarily disturbed acreage of agricultural soils	1	1	11	2	<0.5	2	5	<0.5	0	0	0	0	1	2	**1**
	Permanently affected acreage of classified commercial forest lands	0	29	106	36	5	29	17.2	0	32	17	72	52	37	17	**31**
	No. towers in floodplain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**0**
Economic Conditions	Level of Impact	I	I	I	I	I	I	I	I	I	I	I	I	I	I	**I**
	Permanent loss of timber production (MBF/yr)	0	17.5	71.6	22.1	3.3	17.5	7.6	0	14.1	7.6	34.2	22.5	16.5	7.6	**14.0**
	Value of lost production (approximate $/yr)	0	3,900	16,100	5,000	700	3,900	1,700	0	3,200	1,700	7,700	5,100	3,700	1,700	**3,200**
	Lost timber employment (number of jobs)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	**<0.5**
Social Conditions	Dwelling units within 1000 feet of right-of-way															
	Houses	**34-40**	**34-40**	16-20	80-90	0	115-130	2-4	20-25	4-6	0	0	0	4	4	**4**
	Apartments	0	0	0	230-290	0	230-290	0	0	0	0	0	0	0	0	**0**

LEVEL OF IMPACT: I = INSIGNIFICANT IMPACT, M = MODERATELY SIGNIFICANT IMPACT, H = HIGHLY SIGNIFICANT IMPACT

[1] **Part of new preferred alternative.**

TABLE 1-6
COMPARISON OF MEDFORD BASIN OPTIONS (H, I, K, L AND M)[1]

Areas of Investigation	Impact Parameters	**Draft** Preferred Alternative Medford Portion	Option H West Route	Option I[2] Existing Corridor	Option K[3] **Draft** Preferred Alternative, Ultimate	Option L[4] West Route Ultimate	Option M[5] Existing Corridor Ultimate
General	Corridor length (miles)	31.3	30.4	28.5	31.3	30.4	28.5
	Area of new right-of-way (ac)	657.8	502.6	376.4	1,132.1	737.5	469.0
	New Access Roads (miles)	73.8	36.3	15.2	73.8	36.7	15.6
Soils	Level of Impact	I	I	I	I	I	I
	Approximate soil loss (tons/yr)	2,000	1,310	430	2,000	1,310	430
Water Resources	Level of Impact	I	I	I	I	I	I
Vegetation	Level of Impact	I	I	I	I	I	I
	Vegetation Clearing (ac)						
	Access Roads -Grassland	9	3	3	9	4	4
	(All Vegetation -Forest	114	58	22	114	58	22
	Cleared) -Riparian/Wetland	2	<1	<1	2	<1	<1
	Right-of-Way -Forest	402	288	189	402	288	189
	(Tall Vegetation -Riparian/Wetland	11	6	6	11	6	6
	Cleared)						
	Candidate Threatened or Endangered Plant Occurrence (no. known sites)	0	1 (probable)	1 (probable)	0	1 (probable)	1 (probable)
Wildlife	Level of Impact	M	I	I	M	I	I
	Habitat Modification (ac)	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation	see Vegetation
	Columbian White-tailed Deer Effects	None	None	None	None	None	None
	Crucial Deer Winter Range						
	New Cleared R/W (ac)	50	9	6	50	9	6
	New Access Roads (miles)	8.5	1.3	1.2	8.5	1.3	1.2
	Waterfowl Collision Mortality Level	I	I	I	I	I	I
	Old-growth Habitat Reduction (ac)	4	13	4	4	13	4
	Salmonid Sedimentation Impacts	I	I	I	I	I	I
Cultural Resources	Level of Impact	I	I	I	I	I	I
Recreation Resources	High Recreation Impact Areas	0	0	0	0	0	0
	Moderate Recreation Impact Areas	2	0	0	2	0	0
Visual Resources	High Visual Impact Areas	1	0	0	1	0	0
	Moderate Visual Impact Areas	1	1	1	1	1	1
Land Use	Commercial/Industrial Uses						
	High Impact Areas	0	0	0	0	0	0
	Moderate Impact Areas	0	0	0	0	1	1
	Residential Land Use						
	High Impact Areas	0	0	0	0	0	1
	Moderate Impact Areas	1	0	1	1	2	2
	Permanently affected acreage of prime agricultural soils	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Additional right-of-way acreage on prime agricultural soils	21	0	4	21	0	4
	Temporarily disturbed acreage of Agricultural Soils	13	5	3	13	5	3
	Permanently affected acreage of classified commercial forest lands	135	183	49	135	183	49
	No. towers in floodplain	3	3	3	3	3	3
Economic Conditions	Level of Impact	I	I	I	I	I	I
	Permanent loss of timber production (MBF/yr)	45.7	61.9	16.5	45.7	61.9	16.5
	Value of lost production (approximate $/yr)	10,300	13,900	3,700	10,300	13,900	3,700
	Lost timber employment (number of jobs)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Social Conditions	Dwelling units within 1000 feet of right-of-way						
	Houses	20-24	100-120	130-160	20-24	100-120	130-160
	Apartments	0	0	0	0	0	0

Level of Impact - I = Insignificant Impact, M = Moderately Significant, H = Highly Significant Impact

[1] All options originate at West Fork Evans Creek and terminate at Meridian Substation.

[2] **Part of new preferred alternative.**

[3] Could require up to 8.5 miles of new access roads in future.

[4] Could require up to 5.4 miles of new access roads in future.

[5] Could require up to 4.3 miles of new access roads in future.

environmental impacts is also presented. The narratives deal with significant physical, biological and social science impact considerations.

Physical Sciences

Significant impacts associated with the physical environment (air and water resources, soils, and geology) would be limited to increased erosion and sedimentation in the area of West Fork Evans Creek. New and upgraded access road construction and tower site work would be the primary cause of increased erosion and sedimentation in this area. The highly erodible granitic soils near West Fork Evans Creek make erosion difficult to control, although practices required by BLM and the State of Oregon would limit impacts. It is, nevertheless, uncertain that impacts in this area would be reduced to a level of insignificance.

Biological Sciences

Construction of the draft preferred alternative, Alternatives 2 or 3, or Option K would have moderately significant wildlife impacts along the new corridor segment in the Medford area. The loss of habitat caused by access road construction and the increased disturbance caused by greater human access which would likely occur during and after construction would reduce the quality of wildlife habitats in those presently remote areas north and east of Medford. Impacts due to new access road construction in new alignment portions of Options H and L are not expected to be significant due to the steepness of the area which inhibits human access, and the lesser amount of new access road construction relative to the preferred alternative. Of the routes under consideration in the Medford area, the route of Options I (part of the new preferred alternative) and M would minimize wildlife impacts resulting from access road construction.

Impacts to salmonids may be moderately significant in the West Fork Evans Creek drainage due to sedimentation problems resulting from unstable soils for all construction alternatives. Alternative 2 would have the greatest potential for signficant impacts in this area. None of the options would modify the potential for impacts.

SOCIAL SCIENCES

Impacts on the social environment are broad, and in some instances, significant. Significant impacts occur in the areas of visual resources, recreation, and land use.

Recreation

Impacts of the project alternatives and options on recreation would be insignificant in most cases, but would be significant at a few specific sites. The recreation impacts of the proposed line would be limited to changes in the character of views from these sites that would detract

from the quality of the recreation experience. Designated recreation sites along the draft preferred alternative include proposed sections of the Ridgeline Trail in South Eugene, and Takelma Park near the Rogue River Crossing; impacts on both would be significant. In the case of Options H, I, L, and M in the Medford Basin, the existing corridor passes through Hoover Ponds and Jackson County Sports Park. Impacts on the former would not be significant if the park remains undeveloped, but could increase if the park is developed for passive uses such as nature trails and views. However, this appears unlikely. The intensive recreation activity at Jackson County Sports Park would not be affected by visual changes introduced by a transmission facility. Alternative 4 would therefore avoid the impacts to the Ridgeline Trail and Takelma Park, at the expense of unlikely future impacts to Hoover Ponds.

Adverse effects on dispersed recreation would be significant at the North Umpqua Highway. These impacts could be avoided and the visual impacts of the existing transmission lines could be rehabilitated to a large extent by rerouting the line down a side valley (Option D).

The impact on dispersed recreation along the Rogue River would be significant at the draft preferred alternative crossing, just north of Takelma Park. Options H, I, K, and L would not cause significant incremental impacts at the existing Rogue River crossing. The underground option, J, would have significant impacts on recreation during construction, but would reduce long-term impacts to a minimum.

Visual Resources

All alternatives and options, with the exception of the no action alternative, would have significant visual impacts. The parallel alternative would have greater impacts than either configuration of the preferred alternative, due to increased clearing and the retention of existing lines. The double circuit alternative would cause greater visual impacts than one single circuit line in the short term, but less impacts than single circuit construction, particularly in the short term. The draft preferred alternative would cause high visual impacts in two areas. The parallel alternative would cause high visual impacts in three areas, while the double circuit alternative would cause high visual impacts in four areas. This number could be reduced or increased with the adoption of various options. Through incorporation of Options C and I, the new preferred alternative avoids all of these areas of high visual impact.

Options B and C would avoid the high impact segment of the Twin Oaks-Spencer section of the draft preferred alternative, although Option B would create significant impacts by opening a new corridor between Lane and Camas Swale. Option D, the North Umpqua Highway Bypass, would help to rehabilitate the adverse visual effects of the existing corridor along this designated scenic highway, thereby eliminating a significant impact site. Option E would have a significant impact on the I-5 corridor.

In the Medford Basin, the visual impact comparison of the draft preferred alternative and Option K to Options H, I, L, and M involves a tradeoff between viewer exposure and visual contrast with existing conditions. Options H, I, L, and M would be visible to many more people than the draft preferred alternative, but would not cause signficant contrast with existing visual resources or significant change in scenic quality, except in the Lower Table Rock area. Therefore, impacts would be categorized as moderately significant for these options. For the draft preferred alternative and Option K which involve opening a new corridor, visual impacts are rated as high.

Land Use

The draft preferred alternative would have no effect on commercial and industrial uses because it would not cross areas used for these purposes. The existing corridor in the Medford Basin crosses an area of commercial and light industrial development in White City. Options H and I would have no effect on this development because they could be accommodated with the existing right-of-way. Options L and M would require more right-of-way and result in a significant land use impact. However, these options would establish a corridor in the Medford Basin that would accommodate all transmission development for the foreseeable future and would thus reduce the potential for significant land use conflicts later.

The primary effects of the draft preferred alternative on residential land use would be the decrease in visual amenity now associated with a number of residential areas that the proposed line would cross. These adverse effects would be significant in the South Eugene area, where a large number of residences occur about the existing corridor, and in the Medford Basin. Alternatives 2 and 3 would cause a significant increment of visual impact at other residential concentrations, including Lynx Hollow, West Cottage Grove, Fair Oaks, and Elkhead.

Options B and C would avoid the heavily developed Fox Hollow Road area in South Eugene and so would reduce visual impacts. Option B, however, would open a new corridor through a developing rural residential area and have significant impacts in itself. Modified Option G represents the alignment that reduced effects on rural residential land use in a portion of the Evans Creek area. In the Medford Basin, where all options have moderately significant impacts, Options H, I, L, and M would increase residential impacts associated with incremental visual impacts along the existing corridor, but would avoid other impacts associated with opening a new corridor through more sparsely developed terrain on the perimeter of the Medford Basin. Options L and M also appear to require the purchase of three residences near the Meridian Tap to reserve sufficient right-of-way for possible future 500 kV development.

Economic and Social Conditions

The effects of the proposed transmission line on agricultural and forest productivity, local tax bases, and economic activity in the surrounding area would be insignificant, although some individual

landowners would experience or perceive adverse effects. Social consequences resulting from an influx of transmission line workers, noise, and electrical and magnetic effects would also be insignificant. Adverse social reaction to the project would likely be significant in some areas, although this response cannot be measured and stems directly from land use, visual and other impacts. Negative economic and social effects could result from the no action alternative, but the severity and likelihood of such effects cannot be established.

POSSIBLE MITIGATION MEASURES

During the preparation of the Draft EIS, mitigation measures were identified by the preparers of the EIS and other interested parties. These mitigation measures go beyond the techniques that BPA and Pacific routinely employ as part of their standard design and construction practices and are described earlier in this chapter and in Appendix A. These mitigation measures, which have been addressed in the EFSC Site Certificate, would then be considered prior to issuance of Records of Decision by the federal agencies. This would occur before a BLM grant of right-of-way is issued.

Specific mitigation measures warranting consideration are identified below:

1) Visibility of conductors and towers could be minimized, as follows:

   a) Use of non-reflective conductors from Lane Substation to Spencer Switching Station.

   b) Use of nonreflective treatments to dull galvanized tower steel, minimize its color contrast with the surrounding landscape, and hence reduce tower visibility could be employed along the Lane-Spencer segment and along Options A, B, and C.

   Considerations: The measures described in a) and b) above could make the proposed line less visually prominent and more compatible with the existing visual setting and therefore could reduce overall visual impacts. The additional estimated cost to apply a color-tinted vinyl wash to the tower steel and string non-reflective conductor for these sections of line is $500,000.

2) Tubular steel structures could be used instead of steel lattice structures to reduce adverse visual impacts in areas characterized by high visual quality, high viewer sensitivity, or a combination of both. These areas include the portion of the Lane-Spencer segment between South Willamette Street and Dillard Road (approximately 3 miles), a residential area west of Cottage Grove (approximately 3 miles), both sides of the North Umpqua River crossing (approximately 1 mile), the route segment parallel to the North Umpqua Highway if Option D is not selected (approximately 4 miles) the North Umpqua Highway crossing if Option D is selected

(approximately 1 mile), and the Rogue River and the Crater Lake Highway crossing on the draft preferred alternative (approximately 4 miles).

Considerations: The visual complexity and large apparent scale of steel lattice structures is frequently a principal cause of adverse effects on visual quality in urban areas and scenic areas. These effects are worsened when lattice structures are viewed close at hand by large numbers of people or by sensitive viewing groups such as people engaged in recreation. In comparison, the simplicity and smaller apparent scale of tubular steel structures encroach significantly less on visual quality in scenic areas and are more compatible with urban areas. The route segments listed above are those where the most serious adverse visual effects are likely. (Note: Tubular steel single circuit structures are already proposed for the route segments through Sams Valley (Option I) and from White City Substation to the White City Rifle Range).

The use of tubular steel structures, however, involves tradeoffs. Because more towers are needed per mile for tubular structures, more land would be occupied by towers than if lattice structures were employed. Use of tubular structures might also make it more difficult to span and avoid a potential cultural resource site near the North Umpqua River.

The cost of single circuit tubular steel structures has been estimated by Pacific to be approximately $200,000 more per mile than lattice structures; the cost differential for double circuit structures is substantially higher. A current estimate to construct double circuit tubular structures on the BPA portion of the project is unavailable at this time. Further, if angle structures are required in a particular area, the cost difference between tubular and lattice structures becomes more pronounced.

3) The new preferred alternative would require acquisition of additional right-of-way in the Spencer-Alvey corridor. This could be eliminated by using double circuit tubular steel pole structures to replace the two existing 115-kV wood pole lines, and double circuit steel lattice towers for the proposed 500-kV lines, as was proposed for the Twin Oaks-Spencer segment of the draft preferred alternative (see Figure 1-5). If this mitigation measure were adopted, the existing corridor would be modified as shown in Figure 1-23.

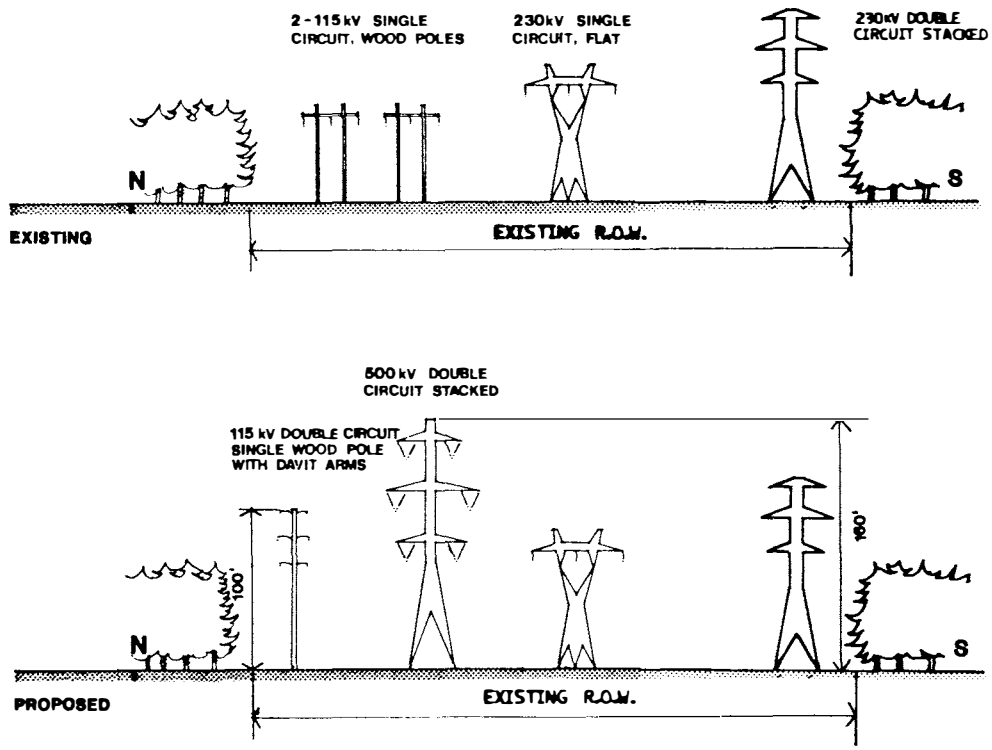


FIGURE 1-23 TYPICAL CORRIDORS IN SPENCER-ALVEY SECTION SHOWING CHANGES THAT WOULD RESULT FROM ADOPTION OF MITIGATION MEASURE TO REDUCE RIGHT-OF-WAY REQUIREMENTS

Consideration: This mitigation measure would eliminate the need to acquire approximately 30 acres of additional right-of-way for Option C (a part of the new preferred alternative) and would, therefore, reduce land use impacts. Visual impacts, however, would increase because of the greater height of the double circuit towers and their potentially greater visibility from Interstate 5 as they enter Alvey Substation. The double circuit structures would also be more visible from Spencer Butte, but would be relatively inconspicuous because Spencer Switching Station is over 2-1/2 miles from viewpoints on top of the Butte, the structures would not be seen against a sky background (see Visual Resources section in Chapter 3), and only a very small section of the double circuit line would be visible from the Butte. This possible mitigation measure would result in diminished land use impacts, but slightly increased visual impacts, particularly from the top of Spencer Butte.

The anticipated impacts and tradeoffs associated with adopting this mitigation measure would be investigated during design studies prior to construction of any alternative.

INCOMPLETE OR UNAVAILABLE INFORMATION

Evaluating environmental impacts for the proposed transmission line requires forecasting project activities and environmental conditions. There is always uncertainty associated with such forecasts. In addition, there are some other areas where information is incomplete. The list below identifies important uncertainties in assessing the impact of this project.

1) Detailed design information for all of the transmission line alternatives and options is not available. This information would be useful for detailed quantification of impacts but would not be available until survey and design activities are completed for the selected alternative. These data are not necessary, however, for evaluating environmental impacts so that alternatives and options can be compared.

2) Threatened or endangered plant surveys have not been conducted along any of the new alignment portions of the draft preferred alternative. Because less information is available for the new alignment portions of the preferred alternative, analyses of these areas are less complete than for areas where surveys were conducted. These detailed studies are not needed to assess impacts in this EIS, but would be required for the selected route prior to construction to identify specific areas so sensitive species could be avoided.

IMPLEMENTATION OF THE DECISION

As described in the Draft EIS, the adopted decision process required BLM to develop a preferred alternative subsequent to EFSC review of the DEIS and resultant site certification. Selection of an alternative that combined features of the various DEIS alternatives and options was identified in the DEIS as an option. Such has happened, based on review of the EFSC site certification process and public comments on the DEIS. This review has resulted in the identification of Alternative 4, the new preferred alternative; this alternative is a modification of the draft preferred alternative incorporating Options C, I, and modified Option G.

After release of the Final EIS (but not before conclusion of the 60-day comment period) the State Director will review the deliberations of the Oregon Energy Facility Siting Council and public comments on the draft and final EISs. The State Director in conjunction with the cooperating agencies will decide whether to issue a right-of-way permit. The final decision would be presented in the Record of Decision and would consider all available information including public opinion, input from state and local organizations, policy and legal constraints, as well as the EIS analysis.

If a right-of-way is granted, Pacific would be authorized to begin its construction activities. Regardless of which alternatives or options would be selected (except for the no action alternative), Pacific would construct the line as described in the right-of-way permit. The timing of project activities, however, could be delayed from one to several years if loads do not grow as forecasted in the Purpose and Need Section.

Pacific's activities would be undertaken in accordance with the terms and conditions of the right-of-way permit, and applicable federal, state, and local laws and regulations.

BPA has indicated a preference for Option C in the routing and line configuration in the vicinity of Eugene. The final decision on the BPA action will be formally documented in a Record of Decision.

INTERRELATIONSHIPS

The BLM will make its decision regarding implementation of the proposed project in accordance with the requirements of the agency's planning process, as established under the Federal Land Policy and Management Act and subsequent regulations. On this project BLM is also participating in a planning process designed to combine federal and state project review activities as described in the Memorandum of Understanding between BLM, Pacific, BPA, and Oregon DOE, the cooperating parties for this project. BLM is also undertaking its activities on this project in consultation with other federal agencies. Each of the agencies identified in Chapter 4, as well as others not listed, have been contacted during preparation of the EIS.

STATE AND LOCAL GOVERNMENTS

Project activities that relate to state and local jurisdictions have been conducted under the direction of the State of Oregon's Energy Facility Siting Council (EFSC). Its staff, the Oregon Department of Energy, has participated in project evaluation activities throughout the duration of the project. The responsibilities of the Council, the standards that must be met by 500 kV transmission projects, and Council rules adopted for this project are all contained in OAR 345.

Among the tests that EFSC has applied to Pacific's application for a site certificate is an evaluation of the relative consistency of the transmission alternatives and options with the Statewide Planning Goals and Guidelines developed by the Land Conservation and Development Commission (LCDC). Under Oregon Senate Bill 100, all counties and cities are required to develop and adopt comprehensive plans and land use goals consistent with the LCDC Goals and Guidelines. The EFSC rules require that local governments affected by a transmission proposal be given the opportunity to make an initial determination of consistency between the proposal and their plans. EFSC then reviews these initial determinations in preparing its findings on project consistency with statewide goals and guidelines. BLM and BPA must also consider project consistency with state and local plans under the terms of the Intergovernmental Cooperation Act (42 USC 4233).

The proposed transmission line would cross Lane, Douglas, and Jackson Counties and the City of Eugene. All of these governments have adopted comprehensive plans (Eugene and Lane County prepared a joint plan for the metropolitan area) and have submitted these plans to LCDC for review and formal acknowledgment. The Eugene plan prior to the current joint plan was acknowledged by LCDC. LCDC also has acknowledged the provisions of the Eugene-Lane County Metro area plan that pertain to the portion of the City that is located within the Urban Growth Boundary. LCDC has acknowledged some portions of the county plans, has continued other portions, and has concluded that yet other portions do not meet the statewide goals and guidelines. Revision, resubmittal, and review of these plans are not likely to be concluded before decisions on this project are made. For this reason, as well as for brevity, the general consistency of the proposed transmission line with the relevant statewide goals and guidelines is discussed here. Nevertheless, the provisions of the county plans that relate to transmission lines are broadly similar to those of the statewide goals and guidelines.

The transmission project is likely to have direct effects on resources that are central to certain goals, have indirect or lesser effects in relation to other goals, and be unrelated to still others. This is recognized by LCDC (Ross 1981). The consistency issues for the first two classes of goals are summarized in Table 1-7. In addition, the project's relationship to the goal pertaining to Citizen Involvement is included in Table 1-7. While all the transmission alternatives and options are broadly consistent with the statewide goals and guidelines, the relative degree of consistency varies with the specific impacts of route and configuration examined. Table 1-7 provides a means to translate the impact described in this EIS and summarized in Tables 1-5 and 1-6 into the framework of state and local planning consistency.

Following publication of the DEIS, Jackson County and the City of Eugene examined the transmission alternatives and adopted findings on the consistency of these alternatives with local plans. In both cases, the findings supported the designation of Alternative 4 as most consistent with these plans.

TABLE 1-7

PROJECT RELATIONSHIP TO LCDC GOALS

LCDC GOAL	DISCUSSION**
1. To ensure citizen involvement in all phases of the planning process.	Citizen involvement has been solicited at each stage of the EIS process. Public meetings were held at project scoping, workshops were conducted when the routing options were being defined, and public hearings will be conducted on the content of this EIS. Other public meetings and hearings have been conducted as part of the EFSC evaluation process.
3. To preserve and maintain agricultural lands.	The transmission alternatives and options differ in the amount of prime farmland required for right-of-way, but overall effects on agricultural production will not be significant.
4. To conserve forest land for forest uses.	The alternatives and options differ in the amount of forest land taken out of production and to the extent to which they maximize utilization of utility rights-of-way before permitting new ones.
5. To conserve open space and protect natural and scenic resources.	This resource conservation goal includes most noncommercial resource values. Generally, alternatives and options which include the greatest amount of new alignment and access roads are least consistent as these activities are most detrimental to this goal.
6. To maintain and improve the quality of the air, water and land resources of the state.	The purpose of Goal 6 is to maintain a healthful environment. For any of the alternatives, there would be short-term impacts during construction. In general, consistency of the goal is least for alternatives and options involving the greatest length of new alignments and new access roads as these have the greatest soil loss and sediment yield.
7. Developments subject to damage or that could result in loss of life shall not be planned nor located in known areas of natural disasters and hazards without appropriate safeguards.	While this goal is relevant to transmission planning and design, it appears that none of the alternatives or options would pose, or be subject to, a significant risk of damage due to natural disasters or hazards.
9. To diversify and improve the economy.	Progress toward this goal is generally not affected by differences between alternatives, with the possible exception of the no action alternative.
10. To provide for the housing needs of the citizens of the state.	This goal is oriented toward maintaining and increasing the housing supply. The proposed transmission line would not appreciably affect the number of houses or availability of land for housing. However, the alternative and options would reduce the amenity values of adjacent housing to differing degrees.
11. To plan and develop a timely, orderly, and efficient arrangement of public facilities and services.	This goal supports the multiple use of public utility easements, the selection of corridors with least environmental impact, and the maximum use of existing investments in public utilities. The alternatives and options differ on these criteria.
13. To maximize the conservation of all forms of energy, based upon sound economic principles.	The proposed line is generally consistent with this goal because it reduces line losses. The alternatives and options do not differ much on this criterion, except for the no action alternative.

* Goals 2, 8, 12, 14, 15, 16, 17, 18, and 19 are not generally applicable to the proposed transmission line.
**See Chapter 3 for impacts of the transmission alternatives and route options on the resources discussed in this table.

CHAPTER 2

AFFECTED ENVIRONMENT

INTRODUCTION

This chapter provides information regarding existing conditions in the project area. Only data considered essential to understanding the basis for subsequent impact analysis are presented in this EIS, while additional detail is provided in the Technical Investigations Report, Routing Study Report, and Appendices to this EIS. The Routing Study Report was designed to identify routing options other than the existing corridors in the Eugene and Medford areas, while the Technical Investigations Report represents the comprehensive data base on existing conditions upon which the impact analyses are based. In order to minimize overlap among the subject areas, brief introductory statements are provided in certain subsections to relate their contents to other pertinent subsections.

The location of areas with potentially significant environmental concerns associated with proposed and existing transmission corridors are shown on Figures 2-1 and 2-2 for the Eugene-Roseburg and Roseburg-Medford segments of the line, respectively.

CLIMATE AND AIR QUALITY

CLIMATE

The climate in the project area is strongly influenced by the Pacific Ocean and mountains of the Coast and Cascade Ranges (USDI BLM 1978a). The result is a temperate, maritime climate characterized by moderately warm summers and wet, mild winters. Local variations in precipitation and temperature can be large, depending on changes in altitude and aspect of mountain slopes.

In the northern part of the study area, the lower lands of the Willamette and Umpqua Valleys lie between the Coast and Cascade Ranges. Warm, moisture-laden air from the Pacific cools as it rises over the Coast Range and heavy precipitation occurs at higher elevations. The air warms as it descends into the valleys, resulting in relatively lower precipitation and higher temperatures. Roseburg experiences about 85 percent cloud cover, 5.5 inches of precipitation per month, and 40°F average temperature during the November to February winter storm season. About 20 percent cloud cover, less than 0.5 inches of precipitation per month, and 65°F average temperature occur during the June through September dry season.

South of Roseburg, topography is more rugged with no well-defined valley between the Coast and Cascade Ranges. Therefore, local climate is highly variable. Elevations are generally higher than in areas to the north, resulting in somewhat lower temperatures in winter and greater snowfall. Winter snowfall is common above 2,500 feet. Above 3,000 feet, snow persists and accumulates.

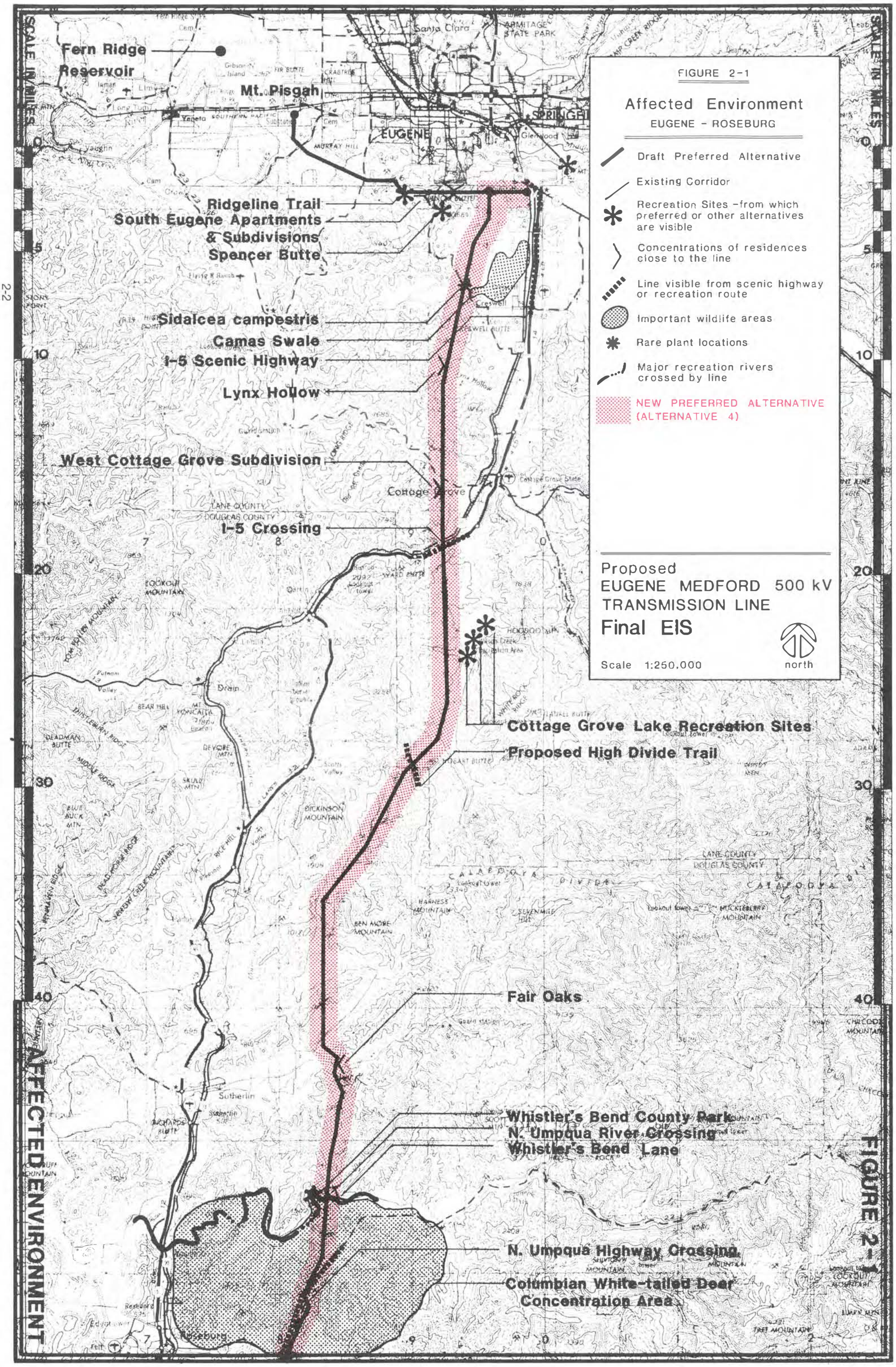


FIGURE 2-1
Affected Environment
EUGENE - ROSEBURG
Draft Preferred Alternative
Existing Corridor
Recreation Sites -from which preferred or other alternatives are visible
Concentrations of residences close to the line
Line visible from scenic highway or recreation route
Important wildlife areas
Rare plant locations
Major recreation rivers crossed by line
NEW PREFERRED ALTERNATIVE (ALTERNATIVE 4)
Proposed
EUGENE MEDFORD 500 kV
TRANSMISSION LINE
Final EIS
Scale 1:250,000
north
Fern Ridge Reservoir
Mt. Pisgah
Ridgeline Trail
South Eugene Apartments & Subdivisions
Spencer Butte
Sidalcea campestris
Camas Swale
I-5 Scenic Highway
Lynx Hollow
West Cottage Grove Subdivision
I-5 Crossing
Cottage Grove Lake Recreation Sites
Proposed High Divide Trail
Fair Oaks
Whistler's Bend County Park
N. Umpqua River Crossing
Whistler's Bend Lane
N. Umpqua Highway Crossing
Columbian White-tailed Deer Concentration Area
EUGENE
SPRINGFIELD
Eugene
Cottage Grove
Roseburg
Sutherlin
Yoncalla
Drain
Creswell
Glenwood
Santa Clara
ARMITAGE STATE PARK
LANE COUNTY
DOUGLAS COUNTY
SCALE IN MILES
AFFECTED ENVIRONMENT
FIGURE 2-1

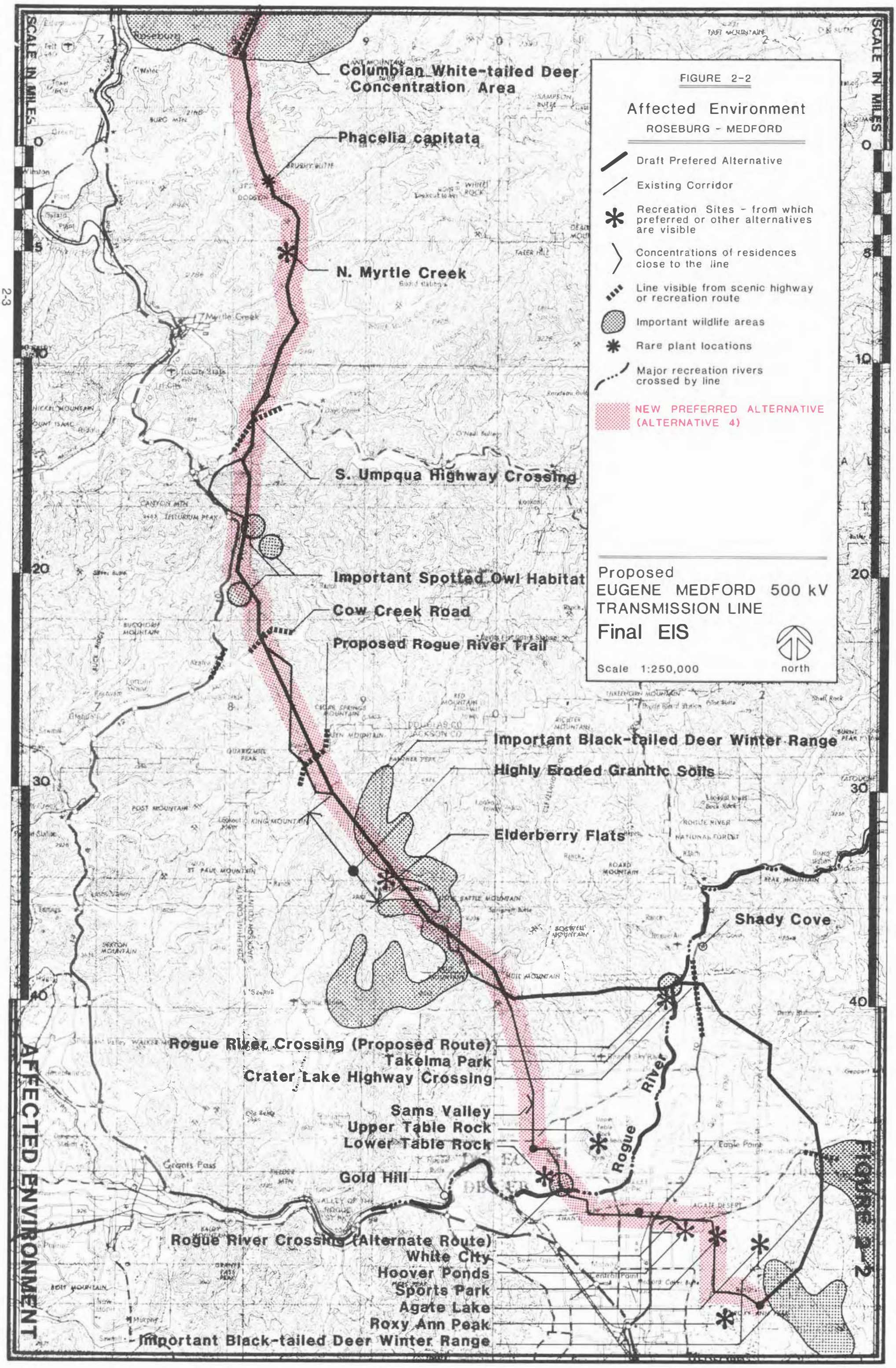


FIGURE 2-2
Affected Environment
ROSEBURG - MEDFORD
Draft Prefered Alternative
Existing Corridor
Recreation Sites - from which preferred or other alternatives are visible
Concentrations of residences close to the line
Line visible from scenic highway or recreation route
Important wildlife areas
Rare plant locations
Major recreation rivers crossed by line
NEW PREFERRED ALTERNATIVE (ALTERNATIVE 4)
Proposed
EUGENE MEDFORD 500 kV
TRANSMISSION LINE
Final EIS
Scale 1:250,000
north
Columbian White-tailed Deer Concentration Area
Phacelia capitata
N. Myrtle Creek
S. Umpqua Highway Crossing
Important Spotted Owl Habitat
Cow Creek Road
Proposed Rogue River Trail
Important Black-tailed Deer Winter Range
Highly Eroded Granitic Soils
Elderberry Flats
Shady Cove
Rogue River Crossing (Proposed Route)
Takelma Park
Crater Lake Highway Crossing
Sams Valley
Upper Table Rock
Lower Table Rock
Gold Hill
Rogue River Crossing (Alternate Route)
White City
Hoover Ponds
Sports Park
Agate Lake
Roxy Ann Peak
Important Black-tailed Deer Winter Range
Rogue River
SCALE IN MILES
AFFECTED ENVIRONMENT
FIGURE 2-2

AIR QUALITY

Air quality is measured by comparing air pollutant concentrations with ambient air quality standards. Air pollutant concentrations exceed standards in the cities of Eugene and Medford but have not been measured to exceed standards in areas between these cities, although relatively little air quality monitoring has been undertaken in these areas. The air quality of the Eugene-Springfield area exceeds national and Oregon standards for carbon monoxide and particulate matter, while the Medford-Ashland area exceeds standards for carbon monoxide, particulate matter, and ozone. As officially designated "nonattainment areas," these urban areas are required to have plans to bring air quality to acceptable levels. Air quality condition outside the non-attainment areas has been designated as achieving the National or Oregon Ambient Air Quality Standards. In the area of concern, measurements of Total Suspended Particulate Matter are routinely made at Creswell, Roseburg, and Oakridge.

In the Medford area, the annual geometric mean concentration is 79 micrograms per cubic meter (ug/m^3), above the standard of 60 ug/m^3, with 10 exceedences of the 24-hour standard in 1980 (Oregon Department of Environmental Quality, 1981). In the Eugene area, the highest geometric mean annual concentration is 44 ug/m^3 with 2 exceedences of the 24-hour standard in 1980.

Sources of air pollution in the project area include a kraft pulp mill in Springfield, several wood products facilities, a nickel mine and smelter in Riddle, Oregon, wood stoves, and mobile sources (automobiles and other vehicles). Open burning of grass and forest slash also contributes to short-term violations of ambient air quality standards. Dispersion conditions in the Willamette Valley and the Medford Basin are conducive to high air pollution concentrations.

GEOLOGY AND SOILS

The project area of the proposed transmission route encompasses three physiographic provinces: the Cascade Range, the Klamath Mountains, and the Willamette Lowland. The bedrock geology consists of sedimentary sandstones, conglomerates, siltstones and shales; igneous basalts and diorites; and metamorphic equivalents of several of the above. Unconsolidated sediments consist of alluvial deposits in river channels and floodplains, and colluvium along the borders of major valleys and in smaller intermountain valleys.

Soil properties vary considerably throughout the project area because of the diverse topography and parent materials. In general, soils on steep slopes are least mature and most susceptible to erosion, whereas those on north-facing slopes, near the base of slopes, and in gentle topography are generally more developed.

Three types of bedrock (granite, serpentine, and tuffs and breccias) have weathered to soils with slope stability or surface erosion problems. Soils formed from granitic rock are highly erodible and prone to deep gullying from surface runoff; a significant area of these soils is located near West Fork Evans Creek, as indicated in Figure 2-2. Soils formed from weathered tuffs and breccias are often unstable and easily eroded. Soils formed in serpentine have high clay content, shallow profiles, and restricted vegetation due to magnesium toxicity, also resulting in erodible soils.

WATER RESOURCES

The project area includes three major drainage basins: the Willamette, the Umpqua, and the Rogue. Major stream crossings would include Calapooya Creek, the North and South Umpqua Rivers, Cow Creek, Evans Creek, and the Rogue River, as well as numerous small streams (Table 2-1). The route would pass within 5 miles of several lakes and

TABLE 2-1

MAJOR STREAM AND RIVER WATERSHEDS POTENTIALLY CROSSED BY THE PROPOSED TRANSMISSION LINE

Coast Fork Willamette Basin	Rogue Basin
Spencer Creek	Grave Creek
Silk Creek	West Fork Evans Creek
Cedar Creek	Battle Creek
Coast Fork Willamette River	Evans Creek
	Sams Creek
Upqua Basin	Rogue River
	Rock Creek
Elk Creek	Snider Creek
Bachelor Creek	Dry Creek
Oldham Creek	Reese Creek
Calapooya Creek	Lick Creek
Sutherlin Creek	Little Butte Creek
Cooper Creek	Yankee Creek
North Umpqua River	Antelope Creek
Oak Creek	Whetstone Creek
North Fork Deer Creek	
South Fork Deer Creek	
North Myrtle Creek	
South Myrtle Creek	
South Umpqua River	
O'Shea Creek	
Canyon Creek	
Cow Creek	
Starveout Creek	

reservoirs, including Cottage Grove Reservoir. The route would also cross approximately 1/2 mile of wetlands, consisting primarily of open water and sand and gravel bar areas of streams crossed by the route and a wetland just south of the North Umpqua River crossing. Most wetlands are small and spanned by the existing transmission lines.

Water use includes domestic and industrial use, irrigation, hydropower generation, and recreation. Existing water quality in the project area is generally good, although selected streams have turbidity, sediment, temperature, and/or nutrient problems, including West Fork Evans Creek, Evans Creek, and Bear Creek. Logging operations have contributed to increased sedimentation and turbidity in some areas.

VEGETATION

The Eugene-Medford corridor traverses three major vegetation zones: Interior Valley, Mixed Conifer, and Western Hemlock (Franklin and Dyrness 1973). The draft preferred corridor would cross 66, 63, and 18 miles of these zones, respectively. The general distribution of these zones within the project area and the existing land cover within approximately two miles of the Eugene-Medford corridor is provided in Chapter 3 of the Technical Investigations Report.

The Interior Valley Zone is the driest and warmest of the three vegetation zones in the project area. It contains four vegetation types including grasslands, chaparral, oak forests, and conifer forests. Grasslands occupy much of the zone occurring on areas incapable of supporting tree growth because of moisture or soil conditions and on areas previously cleared or burned for agricultural purposes. Many lowland hills and some valley bottoms within the zone are occupied by oak woodlands, while Douglas-fir dominated conifer forests occupy most of the foothill areas. Chaparral communities are represented only in small areas, primarily in the Rogue River Valley.

The Mixed Conifer Zone is present at elevations ranging from about 2,000 to 4,500 feet in the southern portion of the project area. It is intermediate between the Interior Valley and Western Hemlock Zones in terms of precipitation and temperature. The zone is dominated by conifer forests containing Douglas-fir, sugar pine, ponderosa pine, incense cedar, and other species. Most forests are second-growth; however, small patches of old-growth occur, primarily along the corridor between the South Umpqua River and Evans Creek. Serpentine areas, which contain unusual floras, occur locally along the corridor within this zone.

The Western Hemlock Zone ranges in elevation from about 500 to over 3,000 feet within the northern portion of the project area, and represents the wettest zone crossed by the route. Vegetation along the route consists almost entirely of Douglas-fir dominated second-growth forests.

Small areas covered by riparian and wetland vegetation are scattered throughout the project area in narrow corridors along streams, along the margins of reservoirs and ponds, in lowland areas where the water table is near the surface, and on poorly drained upland soils. A variety of tree and shrub species typically dominate the riparian areas while the wetland areas are characterized by herbaceous species.

No plants listed or proposed as threatened or endangered under the federal Endangered Species Act occur in the project area; however, several species identified as candidates for listing occur in the project area and two species - Phacelia capitata and Sidalcea campestris - were found within the right-of-way of the preferred alternative (see Technical Investigations Report, Chapter 5). Another candidate species - Limnanthes floccosa ssp. grandiflora - is expected to occur within the right-of-way of Options H, I, L, and M in the White City-Agate Desert area.

WILDLIFE

Hundreds of species of wildlife are present at least along portions of the routes being considered (see Chapters 4 and 5, Appendix C and Technical Investigations Report), due to the length of the Eugene-Medford route and the variety of habitat types crossed. Because of their recreational or commercial importance or their special habitat requirements, the black-tailed deer, Columbian white-tailed deer, bald eagle, osprey, spotted owl, waterfowl, salmon, and trout are considered the most important species.

The black-tailed deer is common throughout the Eugene-Medford area and represents the most important big game species likely to be affected. Three important winter ranges would be crossed by routes being considered in the Medford area (Figure 2-2).

An isolated population of Columbian white-tailed deer, a federally listed endangered species, is found along the existing line near Roseburg (Figures 2-1 and 2-2). This population presently numbers approximately 2,000 to 2,500 animals (Smith 1981a).

The bald eagle, federally classified as a threatened species in Oregon, regularly occurs in low numbers along most of the large reservoirs and river systems in the project area, primarily in winter. No verified nest or roost sites occur near any of the routes under consideration, although nesting is suspected to occur at several locations in the vicinity.

The spotted owl, which is classified as threatened by the Oregon Department of Fish and Wildlife, occurs very locally along the preferred route and is associated with old-growth forests. At least three pairs have been located within 2 miles of the route south of Canyonville (Figure 2-2) (USDI BLM 1979a).

Ospreys summer along all the major river systems and larger reservoirs of the project area. Nesting occurs at many locations where snags or other suitable structures are available for nest support.

A variety of waterfowl occur in the project area. Substantial populations occur at Fern Ridge Reservoir and adjacent areas northwest of Lane Substation during winter and migration periods. Historically, large numbers of waterfowl used the Camas Swale area, but changing land use practices in recent years have substantially reduced habitat quality so that only limited numbers of waterfowl presently use the area (Greer 1981). No large concentrations occur elsewhere along the transmission line, although moderate numbers occur in the Medford area, especially along the Rogue River and its associated sloughs and oxbows.

Anadromous and resident salmonids, including chinook and coho salmon and steelhead, resident rainbow, and cutthroat trout occur in all large and many small streams of the project area. Steelhead trout and chinook salmon provide particularly important sport fisheries in the Umpqua and Rogue River Basins.

CULTURAL RESOURCES

An archaeological, architectural, and paleontological survey of the proposed transmission corridor from Creswell to Ramsey Canyon was conducted. The survey (Connolly et al. 1982) consisted of background research, a check of records of previously recorded sites (including the National Register of Historic Places and the Oregon Statewide Inventory of Historic Places), and on-the-ground inspection of the project area.

The archaeological component of the survey included a walkover of those portions of the project area (approximately 37 percent of the draft or new preferred alternative) determined by BLM in conjunction with the State Historic Preservation Officer (SHPO) to be "culturally sensitive," and subsurface testing of specific predicted site locations. Culturally sensitive areas included the floodplains and adjacent open valleys of the primary streams within each drainage, where prehistoric villages were likely to be situated, and locations with apparent food resource potential such as camas fields and streams. (These same areas have also been the most important to historic-period occupants of southwest Oregon for farming, ranching, and mining activities). Areas excluded from the pedestrian survey were those previously examined by BLM District Archaeologists and those areas considered by BLM and the SHPO to be unlikely to contain cultural resources. Those areas included densely forested and deeply dissected mountainous terrain through which travel is extremely difficult and resource potential for cultural sites is low. Because survey efforts were concentrated primarily on the valley floors where the ground surface is less obscured by vegetation, no regular shovel testing or surface clearing was necessary.

The study area for the historic and architectural resources inventory was defined to include one-half mile on either side of the centerline of the the transmission corridor. This was done to ensure that structures standing outside the project right-of-way, but which might be visually impacted, would be identified.

The survey identified a total of two prehistoric sites within the project area. One of these is a site recorded with the Oregon Archaeological Survey in 1977 and designated 35-DO-61. The site may cover an area as large as 200m X 150m. Deposits containing artifacts (including projectile points, beads, arrow shaft smoothers and broken pestles) may extend to a depth of two meters. The extent of the site and the variety of cultural material reportedly recovered suggest that it could be a major prehistoric village. The second site, discovered during the survey, has been designated 35-DO-199. It consists of a chipped stone scatter of unknown cultural affiliation covering an area of approximately 60m x 80m.

Thirty-seven historic sites were identified within one-half mile of the project centerline. However, only six of these are eligible for the National Register, according to the University of Oregon and the SHPO (Powers 1982). These include the Weaver Farmhouse, Small House, Elkhead Mines, Worthington-Trask farm, O'Shea-Green farm, and Deer Park Inn.

A literature and field review was conducted for the portions of the project area north of Creswell (Eugene area) and south of Ramsey Canyon (Medford area). Information on previously recorded sites contained in the files of the Oregon Archaeological Survey, the Oregon State Museum of Anthopology, the Oregon SHPO, and Lane and Jackson County Planning Departments was compiled. The National Register of Historic Places, the Oregon State Inventory of Historic Places, and General Land Office maps from 1855 were also consulted for the Eugene area. An on-the-ground assessment of identified properties was also conducted to determine the potential for visual impacts on identified sites, but a further survey of the selected project route is planned. This should permit the identification of all previously unrecorded cultural resources in the project area.

RECREATION RESOURCES

Two types of recreation resource areas have been identified along the routes of the proposed transmission line alternatives and options, and have been located on Figures 2-1 and 2-2. The first involves designated parks and recreation sites that would be crossed by a transmission route segment or from which the transmission line would be visible. These are frequently points or small areas at which recreation is concentrated and is a principal land use. The second

type of recreation resource area includes travel routes, rivers, and other features or areas where dispersed recreation is a major incidental use, but which are not formally set aside for this purpose.

RECREATION SITES

Descriptions of all parks and recreation sites from which the existing 230 kV line is visible and discussions of the relative visibility of the line from these sites are contained in the Technical Investigations Report and Appendix B.

The draft preferred alternative and Alternatives 2 and 3 all would cross the Ridgeline Trail being developed by the City of Eugene. Land acquisition for the trail reportedly has included the points where the trail will cross the BPA transmission corridor between Twin Oaks and Spencer Switching Station. The trail will apparently follow existing roads (Dillard and South Willamette) at these crossing points, where the topography exposes trail users to long views down the existing transmission lines and cleared rights-of-way. The route of the transmission alternatives also would cross two proposed Oregon Recreation Trails (Remington 1982). The Spencer-Dixonville segment would cross the future location of the High Divide Trail near the Lane/Douglas County line (Figure 2-1), while the Dixonville-Ramsey Canyon segment would cross the future location of the Rogue River Trail near the Douglas/Jackson County line (Figure 2-2).

The alternatives would be visible to some degree from 12 designated parks or recreation sites: Spencer Butte, Mount Pisgah, Ridgeline Trail, Cottage Grove Lake (three separate sites), Whistler's Bend Park, North Myrtle Creek Park, Elderberry Flats Recreation Area, Takelma Park, Agate Lake, and Roxy Ann Peak. The draft preferred alternative would be clearly visible and prominent occurring within one-half mile of views from Ridgeline Trail, Whistler's Bend Park, and Takelma Park. At the other sites, the line would be visible in the distance, over 1-1/2 miles away, or would largely be screened from view by vegetation or topography.

Options H, I (the new preferred alternative), and the ultimate development Options L and M would follow an existing transmission corridor through the Medford Basin across two parks or recreation sites: Hoover Ponds, which is undeveloped, and Jackson County Sports Park, which has extensive facilities for active recreation that includes drag racing and target-shooting. These options would also cross the north and east slopes at the base of Lower Table Rock, which is maintained as a natural area by BLM and the Nature Conservancy and which is also used for passive recreation, although formal public access has not yet been provided. These route options would also be visible from Agate Lake, Roxy Ann Peak, and Upper Table Rock.

DISPERSED RECREATION

Dispersed recreation in the study area includes such activities as hunting, fishing, river floating, sightseeing, and driving for pleasure, often in connection with visiting the national forests and Crater Lake National Park in the Cascades. The quality and character of views from major designated scenic highways is a significant element in these dispersed recreation activities.

The draft preferred alternative and Alternatives 2, 3, and 4 would be visible from Interstate 5 at three locations indicated in Figures 2-1 and 2-2, but would be prominent only at the crossing south of Cottage Grove. Four other scenic routes would be crossed by the draft preferred route: the highways along the North and South Umpqua Rivers, Crater Lake Highway south of Shady Cove, and Highway 140 east of Brownsboro.

Among the options, Option C (Spencer-Alvey) would be visible from I-5 at Alvey Substation, Option E would be visible from I-5 for a number of miles in the Canyonville area, and Options H, I, L, and M would be visible from the Crater Lake Highway at White City. This last area, however, is not particularly scenic. In comparison with the preferred alternative, Option D would greatly reduce the length of the North Umpqua Highway (Route 138) from which the line would be visible, while Option E would increase the visibility of the line from Interstate 5 near Canyonville.

The draft preferred alternative and Alternatives 2, 3 and 4 would cross the North Umpqua River at a stretch identified by the State of Oregon as having potential for Scenic Waterway designation. While the State Transportation Commission reviewed the study and chose not to continue the designation process for the North Umpqua River (Lilly 1981), the river is heavily used for recreation. This reach of the North Umpqua was not included in the Phase I inventory of potential national wild, scenic, or recreational rivers by the former Heritage Conservation and Recreations Service. The draft preferred alternative, Alternatives 2 and 3, and the options for the Medford Basin would also involve an overhead or underground crossing of the Rogue River, which is a major recreation resource. The portion of the Rogue which traverses the Medford Basin is not eligible for the National Wild, Scenic, and Recreation River System because of the extent of development along its banks nor is it being considered as a state Scenic Waterway, but it receives high levels of recreation use.

VISUAL RESOURCES

The visual environment has been described and discussed in detail in Appendix B and the Technical Investigations Report (Chapter 6). Although no areas crossed by the alternatives and options are classified as Visual Resource Management Class 1 areas by BLM planners,

Class 2 and 3 areas are of considerable extent. These classifications represent a determination by BLM that visual resource considerations are important in these areas.

The existing environment in the study area varies considerably in visual character, from suburban areas and commercial strips to pastoral landscapes set in narrow valleys and large expanses of rugged forest land. The environment through which the line would pass is predominantly rural. Many areas are important for dispersed recreation or as transitional zones between developed areas and the more spectacular scenery of the high Cascades. Other areas have important physical features or landmarks, such as Spencer Butte, Roxy Ann Peak, the Table Rocks, the North and South Umpqua Rivers, the Rogue River, and Cottage Grove Reservoir. These features are generally valued for their existing visual character and lack of signs of development, as are many of the small valleys traversed by the line. The topography of several of these features also provides extensive views of surrounding areas.

The established visual character of the developed areas adjacent to the larger towns and other settlements may also be important to local residents, although the scenic quality of these areas is often rated as moderate or even low, using the BLM Visual Resource Management System.

LAND USE

Existing land uses and land use patterns between Eugene and Medford and along the transmission route segments are described and discussed in the Routing Study Report, Technical Investigations Report, and Appendix B of this EIS.

Land uses in the area vary widely, including commercial forestry in the hills; farms and ranches in the small valleys and more open flat plains; scattered rural residences; and suburban subdivisions and urban and industrial development in the vicinity of Medford and Eugene. Land use trends near these two cities appear to favor the continued extension of large lot (1 to 10 acres or more) rural development and the decline of commercial agriculture, except for orchards. However, small-scale farming and animal husbandry for personal use is extensive in the rural residential areas.

Specific land use features of concern are identified in Figures 2-1 and 2-2, primarily consisting of residential areas adjacent to the existing corridor. The numbers of houses within 1,000 feet of the existing and proposed corridors were estimated from air photography and field surveys, and are cited in Appendix B and the Technical Investigations Report. Only those areas with a concentration of 10 or more houses within this zone, or with houses along the edge of the existing right-of-way, are noted on these maps.

Other developed land uses occur in limited areas along the routes of the project alternatives and options. These include several commercial buildings located immediately north of Dixonville Substation. A school is also located immediately south of this substation. Other commercial structures, a planned commercial development, and a number of light industrial structures are located in the area where the existing Medford Basin corridor (Options H, I, L, and M) crosses Highway 62 at its junction with Highway 140 in White City. A sand and gravel extraction operation is also located on the south bank of the existing Rogue River crossing; this operation will be extended to the north bank of the river under the terms of a recent conditional use permit. Finally, the existing Medford Basin corridor passes within several miles of the Medford airport and parallels a small private landing strip immediately north of Table Rock Switching Station.

AGRICULTURAL

The proposed route for the four Eugene-Medford transmission alternatives would pass through a number of agricultural areas. Various agricultural activities are conducted in almost all of the valley areas that would be crossed by the route. North of Ramsey Canyon the dominant agricultural uses consist of pasture land and hay and grass-seed production, as there are few orchards or fields of row crops in this area. Farming in the Medford Basin is much more extensive and diverse, with large areas of irrigated land and numerous orchards and fields of other more highly-valued crops. In the Eugene routing area, farmlands are concentrated in the valleys of Spencer and Camas Swale Creeks, and in Camas Swale itself. Farmlands in the Medford area are distributed along the Rogue River and its tributary streams, including Little Butte Creek, in lower Sams Valley, and near Eagle Point.

In addition to identifying agricultural areas and corresponding types of production along the route, lands within the proposed corridor were also classified according to their potential agricultural capability. This was done to comply with the requirements of the National Environmental Policy Act and subsequent Council on Environmental Quality memoranda (to heads of federal agencies, dated August 30, 1976 and August 11, 1980) concerning analysis of effects on farmlands, particularly prime and unique farmlands and other specially designated farmlands. Using data and maps from the U.S. Soil Conservation Service and county planning departments, the agricultural capability levels of lands along the proposed route were determined and classified as prime agricultural soils, other agricultural soils, and nonagricultural soils (refer to Chapter 6 of the Technical Investigations Report for a more complete description of data sources, methodology, and definitions). This classification of soils as prime or other types of farmlands is based upon potential soil productivity, as opposed to current production; some lands along the route which are classified as farmlands are actually forest or grasslands, but could be used as

cropland. Soils classified as prime farmlands are concentrated in the stream valleys of Lane County and in the Medford Basin, distributed in general correspondence to the farmland areas mentioned above. The proposed route does not cross any prime farmlands in Douglas County.

FOREST LANDS

The proposed Eugene-Medford route would cross lands which are predominantly forested. Various types of forest and woodland communities occupy most of the upland areas between Lane Substation and Canyonville, with farmlands or grasslands on the valley bottoms. Forest cover is virtually continuous from Canyonville to Ramsey Canyon, and is the dominant vegetative type in the hills flanking the Medford Basin.

The productive capability of forest lands along the routes of the alternatives and options was identified according to site class, as described in the Technical Investigations Report. Roughly three-fifths of the total potential route mileage was determined to be commercial forest land of Site Class 5 or better, capable of producing 50 or more cubic feet of wood per acre per year. More than half of this commercial forest land consists of less productive Class 4 and 5 sites, with productive capabilities ranging from 50 to 119 cubic feet per acre per year.

Forest productivity tends to decrease from north to south along the route, due to prevailing climatic and other site conditions. Forest sites in the Lane County portion of the route are primarily Class 3 (120 to 164 cubic feet) lands, with a few small parcels of Class 2 (165 to 224 cubic feet) land. The new corridor routing option for the Eugene area (Option B) would pass primarily through Class 3 forest land, although little of the forested land around Eugene appears to be actually committed to forestry. Forested lands from the Elkhead area to Ramsey Canyon are predominantly Class 4 and 5 sites, with Class 3 sites generally limited to some of the northerly slopes. Most of the route for Options H and L between Ramsey Canyon and Sams Creek is Class 4 and 5 land. The Medford Basin portion of the draft preferred alternative has isolated upland patches of Class 5 timber (and large areas of noncommercial timber), while the existing corridor (Options I and M) is essentially devoid of commercial timber below Ramsey Canyon.

FLOODPLAINS

The Eugene-Medford corridor includes a total of 14 separate crossings of 100-year floodplains between Lane and Meridian Substations (see Section 6.4 of the Technical Investigations Report), according to the official Flood Hazard Boundary Maps or Flood Insurance Rate Maps for the project area (Federal Emergency Management Agency 1981; USDHUD 1978a, 1978b). The combined length of these floodplain crossings along

the draft preferred alternative is about 2.9 miles. The longest of these crossings, each about .6 miles in length, would be at the South Umpqua and Rogue Rivers. All of the remaining crossings are .3 mile or less in length. The Medford area routing options would involve different stream crossings, while the total floodplain mileage for Options H, I, L, and M would be slightly greater than for the draft preferred alternative.

ECONOMIC CONDITIONS

Economic activity in Douglas, Jackson, Josephine, and Lane Counties is centered on forest products, although other types of manufacturing, agriculture, recreation and tourism, and education are also important activities. Combined non-agricultural wage and salary employment for the four counties reached 200,440 workers in 1980, with individual figures ranging from 23,430 in Josephine County to 103,200 in Lane County (Oregon Department of Human Resources, Employment Division 1981). Average annual employment growth rates for the decade of the 1970s were rapid, ranging from 3.3 percent per year in Douglas County to 6.0 percent per year in Josephine County (see Technical Investigations Report, Table 7-5). The overall rate for the four counties combined was 4.3 percent per year. Most of this growth can be attributed to the maturing of the local economies and resultant rapid expansion of the non-manufacturing sectors, particularly trade and services.

Unemployment rates in southwestern Oregon were comparatively high throughout the 1970s, despite the strong employment growth. All four of the counties had average annual unemployment rates of greater than 8.0 percent for the decade, while the rates for 1980 ranged from 9.8 percent in Lane County to 13.0 percent in Josephine County (Oregon Department of Human Resources, Employment Division 1981). Per capita income levels in the region were noticeably below that for the State of Oregon, while income growth in Josephine County lagged behind statewide income growth during the 1970s (Oregon Department of Economic Development 1981).

Evaluation of the potential economic effects of the no action alternative requires consideration of economic impacts on Pacific's service area in southern Oregon and northern California (Pacific's Southwest Division, except Coos Bay). The Oregon portion of the service area includes parts of Coos, Douglas, Jackson, Josephine, Klamath, Lake, and Lane Counties. California counties partially within the service area include Del Norte, Modoc, and Siskiyou Counties. Pacific's current forecast for the service area includes a 1981 total population figure of 426,314 persons (Pacific 1982a). The Oregon portion of the service area accounted for 91 percent of the total, or about 389,000 persons, while the California population in the service area was estimated at about 67,300 persons. Total employment in the service area for 1981 was estimated at 165,096 workers, with respective Oregon and California shares of 85 percent and 15 percent.

SOCIAL CONDITIONS

The total population for Douglas, Jackson, Josephine, and Lane Counties was 560,250 in 1980, as shown in Table 2-2, a figure equal to 21.3 percent of the total Oregon population. The 1980 population figures for the four counties ranged from about 58,800 in Josephine County to over 275,200 in Lane County. Population growth in this area has been relatively rapid during the past two decades, as the combined population of the four counties increased by 2.2 percent per year from 1960 to 1970 and 3.0 percent per year from 1970 to 1980. While Josephine County has exhibited the most rapid growth rate, most of the population growth occurred in Jackson and Lane Counties.

The transmission routes being considered generally would pass through sparsely populated forest and agricultural areas. Exceptions include pockets of rural residential development, such as the areas south of Eugene, west of Cottage Grove, near the North Umpqua River, and at several places in the Medford Basin. The proposed transmission line would not be isolated from population and service centers, despite the low population density in the areas near the corridor. The transmission corridor between Eugene and Medford is roughly parallel to and within relatively short driving distance of 24 incorporated communities located in the Interstate 5 corridor.

TABLE 2-2
COUNTY POPULATION GROWTH: 1960-1980

County	1960	1970	Percent Change (Annual Rate) 1960-1970	1980	Percent Change 1970-1980
Douglas	68,458	71,743	0.5	93,748	2.7
Jackson	73,962	94,553	2.5	132,456	3.4
Josephine	29,917	35,746	1.8	58,820	5.1
Lane	**162,890**	**213,358**	**2.7**	**275,226**	**2.5**
Total	335,227	415,400	2.2	560,250	3.0
Oregon State	1,768,687	2,091,385	1.7	2,632,663	2.3

Sources: U.S. Department of Commerce, Bureau of the Census. 1971. 1970 census of population. Washington, D.C.
_____. 1981. 1980 census of population and housing, advance reports. Washington, D.C.

CHAPTER 3

ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter presents the findings of impact analyses undertaken in each subject area. Only resources which are affected are discussed, while other considerations such as climate and geology which are not affected by any of the alternatives and options are omitted. The reader should refer to corresponding sections in Chapter 2 and to Figures 2-1 and 2-2 for a description of the environment where these impacts occur.

This chapter is organized so that each resource category is addressed in a separate section. In these sections information characterizing the environmental consequences of the alternatives and options is presented. The manner of presentation varies from section to section, however, and each section is organized with the intent to clearly and briefly present important findings. In general, this is accomplished by defining terms and describing environmental consequences applicable to all alternatives and options in the beginning of the section. This is followed by a discussion of the draft preferred and other alternatives and then the options. A separate discussion of the effects of the new preferred alternative is not provided because this alternative is a composite of the draft preferred alternative and Options C, I and modified Option G; the differential effects of the new preferred alternative are, therefore, generally identified in the discussions of these options. A summary of the effects for the new preferred alternative is included in Chapter 1. In all discussions, if facts can be more briefly and clearly presented by comparing them to information presented earlier, this is done. Similarly, if a particular resource is unaffected by one of the alternatives or options it is not discussed.

In general, impacts are quantified; in cases where impacts are qualitative or cannot be readily quantified, estimates of the significance of impacts are made in accordance with NEPA regulations (40 C.F.R. 1508.27). Two factors, context and intensity, are considered in determining significance. Briefly, context refers to analyzing an action or potential impact from several different viewpoints or perspectives. Thus, national, regional, and local impacts are considered as well as short-term (less than 1 year) and long-term effects. Intensity refers to evaluating the severity of the impact according to various disciplines and types of effects, e.g., public health and safety, biological, cultural, historical, land use effects, human environment, cumulative impacts, endangered species, etc.

In this document, significance is placed in one of three categories: highly significant, moderately significant, and insignificant. Designations of significance can be based on a single factor or on a cumulation of factors, such as adverse and beneficial impacts which, considered together, result in a particular level of significance. Thus, the extent to which these factors are affected can be used in determining the level of significance. Preparers are guided by the CEQ

regulations and the relative importance of various factors affecting the analysis within their particular discipline. For example, in the visual analysis section both the context and intensity of impacts are considered in evaluating impacts at the Rogue River crossings. At both the existing and draft preferred alternative crossings of the Rogue, the river itself is recognized as an important regional source. It is also recognized that impacts to it would be long-term; hence the impact of each crossing is significant from the standpoint of context. The intensity of impacts at the existing crossing, however, is not significant, largely because of the presence of the existing line. The intensity of impacts at the preferred alternative crossing, however, is significant. This is true, in spite of measures taken to limit its impact, because of the area's high scenic quality. Although the significance of impacts is identified in this chapter, other impacts which are not significant are also analyzed in this section. This impact information is used in Chapter 1, where impacts are presented in comparative form in Tables 1-4, 1-5, and 1-6, and in the accompanying narrative.

Several of the impact discussions center on various aspects of land resources, such as vegetation, land use, and soils and forest productivity. Many of the data used in these analyses relate to compilations of existing land cover types. Tables 3-1 and 3-2 provide tabulations of land requirements of the alternatives and of the options and corresponding parts of the draft preferred alternative for each of five broad land cover types. Included are land requirements for new rights-of-way, new clearing, and new access roads.

AIR QUALITY

Several activities associated with transmission line construction can cause particulate matter and gases to enter the atmosphere and degrade air quality. Particulate matter originates from smoke from open burning of waste vegetation as well as from dust generated by construction activities. Gaseous hydrocarbons and oxides of sulfur and nitrogen are emitted from vehicle exhaust and open burning. The impact that these air pollutants have on sensitive persons or crops depends on topographic and meteorological factors, as well as the amount of each pollutant emitted. Construction impacts are characterized by local air quality degradation during the period when equipment operation or slash burning is occuring at a given location. The project alternatives differ slightly in air quality impacts. In general, impacts increase as the amount of clearing required increases because more construction activity and vegetation burning increases emission levels.

Transmission line construction and resultant slash burning might cause intermittent exceedences of the 24-hour Oregon ambient air quality particulate standard, but would not lead to monthly or annual particulate levels above these broader standards. No regulations have been proposed or drafted which would specifically regulate the air quality impacts of such construction activity. Impacts of construction

TABLE 3-1
LAND REQUIREMENTS OF THE DRAFT PREFERRED ALTERNATIVE AND ALTERNATIVES 2, 3 AND 4 BY LAND COVER TYPES[1]

Land Cover Type	Agency **Draft** Preferred Alternative	Alternative 2 Parallel	Alternative 3 Double Circuit	**New Preferred Alternative Alternative 4**
		New Right-of-Way (Acres)		
Urban	0	22	0	**0**
Agricultural	97	251	97	**54**
Grassland	85	261	85	**114**
Forest	1,121	1,979	1,121	**755**
Riparian/Wetland	20	30	20	**14**
TOTAL	1,323	2,543	1,323	**937**
		New Cleared Right-of-Way (Acres)		
Forest	790	1,539	790	**532**
Riparian/Wetland	12	17	12	**6**
TOTAL	802	1,556	802	**538**
		New Access Roads (Miles)		
Urban	0.1	0.2	0.1	**0.1**
Agricultural	0.0	0.0	0.0	**0.0**
Grassland	7.6	9.1	7.6	**3.9**
Forest	109.2	119.1	109.2	**48.5**
Riparian/Wetland	1.1	1.2	1.1	**0.1**
TOTAL	118.0	129.6	118.0	**52.6**

[1]Sources: U.S. Geological Survey Land Use and Land Cover Maps for the Roseburg, Oregon (1974) and Medford, Oregon (1974-75) 1:250,000 quadrangles supplemented by interpretation of August 1980 aerial photography.

TABLE 3-2
LAND REQUIREMENTS OF THE OPTIONS COMPARED WITH THE DRAFT PREFERRED ALTERNATIVE BY LAND COVER TYPES[1 2]

	Option A Lane-115 kV	**Draft** Preferred Alternative	Option B Lane-Camas Swale	**Draft** Preferred Alternative	Option C Alvey-Spencer[3]	**Draft** Preferred Alternative
			New Right-of-Way (Acres)			
Urban	0	0	0	0	0	0
Agricultural	0	26	37	26	0	26
Grassland	0	29	43	40	10	29
Forest	0	59	179	70	20	59
Riparian/Wetland	0	0	0	0	0	0
TOTAL	0	114	259	136	30	114
			New Cleared Right-of-Way (Acres)			
Forest	0	47	133	53	16	47
Riparian/Wetland	0	0	0	0	0	0
TOTAL	0	47	133	53	16	47
			New Access Roads (Miles)			
Urban	0.0	0.0	0.0	<0.1	0.0	<0.1
Agricultural	0.0	0.0	0.0	0.0	0.0	0.0
Grassland	0.3	0.6	2.7	1.1	0.2	0.7
Forest	0.6	1.2	15.6	1.9	0.4	1.6
Riparian/Wetlands	0.0	0.0	<0.1	<0.1	0.0	0.0
TOTAL	0.9	1.8	18.3	3.0	0.6	2.3

	Option D Umpqua Highway Bypass	**Draft** Preferred Alternative	Option E Canyon-ville Existing	**Draft** Preferred Alternative	Option F Green Mt. Existing	**Draft** Preferred Alternative
			New Right-of-Way (Acres)			
Urban	0	0	0	0	0	0
Agricultural	19	0	0	0	0	0
Grassland	71	0	5	0	0	0
Forest	6	0	33	57	72	146
Riparian/Wetland	0	0	0	0	0	0
TOTAL	96	0	38	57	72	146
			New Cleared Right-of-Way (Acres)			
Forest	4	0	22	41	48	104
Riparian/Wetland	0	0	0	0	0	0
TOTAL	4	0	22	41	48	104
			New Access Roads (Miles)			
Urban	0.0	0.0	0.0	0.0	0.0	0.0
Agricultural	0.0	0.0	0.0	0.0	0.0	0.0
Grassland	2.4	0.6	0.1	0.0	0.0	0.0
Forest	0.1	<0.1	0.7	8.1	1.5	20.7
Riparian/Wetlands	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	2.5	0.6	0.8	8.1	1.5	20.7

	Option G W. Fork Evans Cr. Ramsey Canyon	**Modified Option G**	**Draft** Preferred Alternative	Option H West Route Medford	**Draft** Preferred Alternative	Option I Exist. Corridor Medford	**Draft** Preferred Alternative
			New Right-of-Way (Acres)				
Urban	0	**0**	0	0	0	0	0
Agricultural	4	**5**	8	18	34	20	34
Grassland	0	**0**	0	92	44	92	44
Forest	36	**53**	70	380	562	252	562
Riparian/Wetland	1	**1**	2	13	17	12	17
TOTAL	41	**59**	80	503	657	376	657
			New Cleared Right-of-Way (Acres)				
Forest	23	**36**	50	288	401	189	402
Riparian/Wetland	1	**1**	2	6	11	6	11
TOTAL	24	**37**	52	294	412	195	413
			New Access Roads (Miles)				
Urban	0.0	**0.0**	0.0	<0.1	0.0	<0.1	0.0
Agricultural	0.0	**0.0**	0.0	0.0	0.0	0.0	0.0
Grassland	0.0	**0.0**	0.0	2.0	5.2	2.0	5.2
Forest	0.7	**5.0**	9.9	34.0	67.5	12.9	67.5
Riparian/Wetland	<0.1	**<0.1**	0.2	0.3	1.1	0.3	1.1
TOTAL	0.7	**5.0**	10.1	36.3	73.8	15.2	73.8

[1]Sources: USGS Land Use and Land Cover Maps for the Roseburg, Oregon (1974) and Medford, Oregon (1974-75) 1:250,000 quadrangles supplemented by interpretation of August 1980 aerial photography.

[2]That portion of the **draft** preferred alternative corresponding to each option.

[3]**Part of new preferred alternative.**

and operation of the proposed line would be below threshold levels which generally require an analysis or permit by air pollution control agencies.

Construction period emissions from the project would not affect the air quality status of either the non-attainment areas or the remaining areas of the region which currently meet the ambient standards. Slash burning emissions would be minimized by conducting these activities in compliance with the Oregon Smoke Management Plan, administered by the Oregon Department of Forestry. The Smoke Management Plan and permit requirements would minimize impacts by prohibiting burning during adverse dispersion conditions and by prescribing burning techniques which limit emissions. Slash burning impacts could be further reduced by allowing local residents to retrieve slash as firewood. The effect of construction and slash burning emissions upon the Eugene and Medford non-attainment areas would be imperceptible, because the activities would be dispersed and well removed from these urban areas. In summary, the air quality effects of the project upon the surrounding region would be insignificant given the existing levels of emissions from logging, agricultural activities and other sources.

All air quality standards provided by the New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants or local or any other air quality emission standards do not apply to transmission line operation or construction. There are several Class I or "pristine" areas (where air quality is not allowed to deteriorate significantly) in southwestern Oregon, including Crater Lake National Park and the Mountain Lakes, Diamond Peak, and Three Sisters Wilderness Areas. All of these Class I areas are 30 or more miles from any part of the proposed route. Based upon smoke plume analyses performed by Geomet Incorporated (1978), emissions from the project would not have any impact upon these Class I areas.

Following construction, operation of transmission lines produces only minor amounts of ozone and oxides of nitrogen due to corona reactions. These pollutants have not been shown to be significantly increased in ambient concentrations by transmission line operation (Oregon Department of Energy 1980; USDI BPA 1977a; Rog 1979).

SOILS

The three primary impacts of transmission line construction associated with soils would be surface erosion of cleared areas, slope failures of cut and fill areas (landslides, slumps, etc.), and compaction. Surface erosion and slope stability problems are primarily associated with access road construction, whereas compaction is associated with use of heavy construction equipment on access roads, tower sites and construction pads.

Specific erosion problems and appropriate construction techniques associated with each soil type are presented in BLM's Management Framework Plans (MFPs) (USDI BLM 1978b, 1979b, 1980). These plans

outline the standard construction techniques used by the BLM which would be followed by Pacific. On other lands, conditions of the State Site Certificate would require that similar techniques be employed.

Increased surface erosion represents the potentially most severe impact of the transmission line. Elevated erosion rates can reduce soil productivity and degrade water quality. The amount of soil erosion caused by transmission line construction is a function of soil properties, slope, vegetation, rainfall patterns, construction activities and remedial practices. Although detailed soils information is not available for the entire route, it is desirable to compare the impacts of the project alternatives and options in terms of quantified estimates of soil loss. Therefore, existing erosion rates were estimated by using a generalized map of sediment yield (based on stream samples) prepared by the Soil Conservation Service (SCS) (Oregon Department of Environmental Quality 1978). The expected erosion due to construction activities was estimated by using the Universal Soil Loss Equation (USDA 1972). The methodology used for these calculations is described below.

EXISTING SOIL LOSS

The sediment yield map provides approximations of the current amount of eroded sediment reaching a waterbody for all segments of the transmission corridor. The relationship between soil loss and sediment yield is a complex function of the drainage pattern, slope, runoff characteristics and vegetation and cannot be readily defined without detailed studies. For the purposes of this analysis, it was assumed that soil loss is equivalent to twice the sediment yield (USDI BLM 1979c). By making this assumption, the existing soil loss from the proposed transmission corridor can be quantitatively estimated.

CONSTRUCTION PERIOD SOIL LOSS

Increased erosion has been shown to be caused predominantly by access road construction (Fredriksen 1970; U.S.EPA 1975). Tower sites and construction pads contribute an additional small amount of soil loss. Right-of-way clearing contributes to soil loss whenever ground cover vegetation is removed. Construction period erosion rates were calculated by estimating the increased soil loss resulting from each of the above sources according to the following methodology.

The Universal Soil Loss Equation can be used to estimate soil loss if detailed soil information is available:

$$A = R \times K \times LS \times P \times C$$

where: A = Computed soil loss in tons/acre/year
R = Rainfall factor
K = Soil erosivity factor

LS = Length/slope factor
P = Erosion control practices factor
C = Cover factor

The only portion of this equation affected by soil disturbance (removal of vegetation) is the cover factor, C. The cover factors for both existing and disturbed conditions were found from tables provided by the SCS (USDA 1972). The average groundcover was assumed to be 80 percent at the ground surface, and to consist of a mixture of weeds and grass-like plants (grassland) or herbaceous and woody plants and decaying compacted duff (forest). The corresponding cover factor (from the tables) was 0.03. The percent groundcover was assumed to be 0 for the construction phase, corresponding to a cover factor of 0.45.

The construction phase soil loss was then calculated by multiplying the existing soil loss by the ratio of cover factors (0.45 divided by 0.03) which resulted in construction phase soil loss of 15 times the existing rate. This calculation was performed for all areas where the groundcover vegetation would be completely removed: tower sites, construction pads, and new access roads. Right-of-way clearing in forested areas was assumed to result in soil loss 1.6 times the existing rate (Megahan 1972). Upgrading of access roads was assumed to result in soil loss 4 times the existing rate (Brown 1971). Although this method only approximates soil loss, it provides an estimate of the increased soil loss to be expected from transmission line construction and provides a basis for comparing the project options and alternatives. The results of these calculations are presented under the subheadings Alternatives and Options.

Slope stability hazards are a major problem in areas of steep slope where soils are prone to slope failure. These problems would be minimized in these areas because the appropriate standard construction techniques described in the MFPs or the State Site Certificate would be used.

Compaction of soils by use of heavy equipment can reduce soil productivity, delay revegetation, and increase erosion. Compaction is most severe in soils with a high clay content. Standard construction procedures as described in Chapter 1, the MFPs and conditions set forth by the State of Oregon would restrict equipment to the minimum area necessary and therefore confine the effects of compaction to tower and other construction sites.

Several soils crossed by the transmission corridor pose special problems for road construction. The most sensitive area is a five-mile stretch through weathered granite near West Fork Evans Creek. This areas is prone to severe gullying by surface water runoff wherever vegetation is removed. Revegetation of steep slopes is difficult because of the soils' droughtiness and lack of nutrients. Special construction techniques in addition to those identified in the MFPs would be used in these areas (Shade 1982). Therefore, the resultant

soil loss, which would be primarily confined to disturbed areas within the right-of-way, is not expected to be significant, although it could significantly affect water resources (see Water Resources section).

Serpentine soils have restricted vegetation due to magnesium toxicity. With the proper choice of grasses, however, revegetation would not be significantly delayed (Shade 1982). Serpentine soils occur at three sites along the proposed route and extend for less than one mile at each site: near Brushy Butte (approximately 6 miles south of Dixonville), near the Jackson/Douglas County line, and near the confluence of the West Fork Evans Creek and Evans Creek.

Soils high in clay content are generally more prone to slump failure and compaction problems than other soils. Standard construction procedures as described in the MFPs would reduce these effects to a level consistent with that of other BLM administered lands in the surrounding areas. Impacts on state and private lands would occur at the same level through conditions in the EFSC Site Certificate.

The impacts discussed in this section are associated with the construction phase of the transmission line. Soil erosion from access 9oads would gradually decrease as soil stabilization takes place, and within five years would be about one-third higher than undisturbed land (USDI BLM 1979c). Erosion from construction pads, tower sites and other temporarily disturbed areas would decrease more rapidly due to rehabilitation activities. Revegetation would require one to three years in these areas except those within granitic soils which could take ten years or longer to revegetate (Shade 1982).

ALTERNATIVES

The draft preferred alternative is expected to result in an increase in soil loss of 5,400 tons during the first year after construction. This quantity of soil would correspond to approximately 0.06 inch of soil loss on new access roads; 0.02 inch of soil loss on upgraded access roads; and less than 0.01 inch of soil loss within the right-of-way corridor.

Alternative 2, the parallel alternative, would result in approximately 5,900 tons of additional soil loss in the first year after construction.

Alternative 3, the double circuit alternative, is expected to increase soil loss by approximately 5,400 tons during the first year after construction.

Alternative 4, the new preferred alternative, would result in approximately 3,620 tons of additional soil loss in the first year after construction.

Because of the short duration of increased soil erosion (less than 3 years except in granitic soils), and the levels of soil loss involved, the soil impacts of each alternative would be insignificant.

OPTIONS

Option A, Lane-Twin Oaks, would result in approximately 20 tons less soil loss during the first year than the corresponding portion of the

draft preferred alternative. Option B, Lane-Camas Swale (new corridor), would result in approximately 160 tons more soil loss during the first year than the draft preferred alternative. Option C (part of the new preferred alternative), Alvey Substation- Spencer Switching Station, would result in approximately 70 tons less soil loss during the first year than the corresponding portion of the draft preferred alternative. Option D, North Umpqua Highway bypass, would result in approximately 40 tons additional soil loss during the first year after construction as compared to the draft preferred alternative.

Options E, F, G, and to a certain extent modified Option G (part of the new preferred alternative) all represent routes through existing corridors as opposed to new and straighter routes of the draft preferred alternative. The draft preferred alternative generally involves passing directly over ridges rather than following topographic contours. In all three cases, the options result in less soil loss (about 170, 480, and 230 tons during the first year) than the corresponding portions of the draft preferred alternative. Modified Option G would result in 140 tons less soil loss than the draft preferred alternative.

Options H and L in the Medford Basin would result in approximately 690 tons less soil loss during the first year than the corresponding portion of the draft preferred alternative. Despite the more rugged terrain in this area, this route would not result in greater soil loss than the draft preferred alternative, due to its shorter length and location on relatively mild slopes along the ridgeline. Option L, the ultimate development option, would have the potential for additional impacts in the future with the construction of a second Eugene-Medford line.

Options I (part of the new preferred alternative) and M, along the existing corridor in the Medford Basin, would result in approximately 1,570 tons less soil loss during the first year than the corresponding portion of the draft preferred alternative. These options would, however, pass through an area of high bedrock slide potential just south of Ramsey Canyon. Appropriate engineering techniques and siting procedures would be used to minimize bedrock slide hazards, reducing them to an insignificant level. Future impacts of Option M are also possible and would be dependent on the amount of access road construction and clearing at that time.

Option J, an underwater crossing at the Rogue River, would cause erosion of the stream channel and banks during the construction phase as a result of cable burial. After the construction phase, erosion impacts would be insignificant unless cables need to be repaired or removed during the operation of the line.

As discussed above for the alternatives, soil losses resulting from these options would not be significant. Given the above figures for Options C, I, and modified Option G, implementation of the new preferred alternative would result in 1780 tons less soil loss than the draft preferred alternative in the first year after construction.

WATER RESOURCES

The primary water resources impact of construction and maintenance of the transmission line would occur as a result of the increased sedimentation of water bodies. Increased sedimentation in streams is potentially detrimental to fish habitat, navigation channels, recreational activities, and domestic water use.

The increases in sediment yield to be expected from transmission line construction have been estimated according to the methodology described in the previous soils section. The results are discussed under the subheadings Alternatives and Options. Sediment particles would be either deposited in the streambed or transported as suspended solids, depending on the particle size and water velocity. The water quality impacts that would result from the increased sediment yield have been classified as insignificant or moderately significant based on the intensity and duration of the impact. If the impact is expected to be less than 3 years in duration and not result in degradation of water quality to the extent of damaging fish habitat, recreation, or other water uses, it was classified as insignificant. Standard construction procedures which include special measures for problem soils are expected to preclude the occurrence of highly significant impacts.

Sedimentation rates would be highest during the construction phases and would decrease to a base level rate when stabilization has occurred. This would take from one to three years in all areas other than the granitic soils. Revegetation in granitic soils could take 10 years or longer (Shade 1982).

The most critical areas for sedimentation occur in high erosion hazard areas where the transmission route parallels a stream bed for an extended distance. This parallel orientation would occur along the Coast Fork Willamette River (2 miles), Calapooya Creek (1 mile), North Myrtle Creek (3 miles), South Myrtle Creek (2 miles), Battle Creek (2 miles), West Fork Evans Creek (4 miles), and Ramsey Creek (2 miles). The area near West Fork Evans Creek would be located partially in highly erodible granitic soils where stabilization can take longer than 5 years (see soils section for discussion of granitic soils). The water quality impacts of sedimentation in this area may be locally significant because of the expected duration and intensity of the impacts, while sedimentation effects on water quality are expected to be insignificant in the other areas where the line would be parallel to a stream. This is discussed further under the Alternatives subheading in this section and in the soils section.

Stream crossings also pose a potential sedimentation problem. The streambanks of major rivers would generally not be disturbed because the transmission towers would be set back an adequate distance from the bank and since topography is generally flat adjacent to these rivers. Smaller streams would be spanned without removing vegetation from the streambanks. From an impact assessment standpoint, the most critical stream crossings would be the small and intermittent streams crossed by access roads that require drainage systems or culverts. Pacific would follow the BLM procedures outlined in the MFPs (USDI BLM 1978b, 1979b, and 1980), minimizing damage to small and intermittent streams.

Additional critical areas include marshes, springs and seeps. With the possible exception of the Rogue River crossing, these would be avoided in the proposed route by appropriate siting of transmission towers. These areas are further discussed in the Vegetation section.

The proposed route could pass through an area of cinnabar (mercuric sulfide) deposits in northwestern Jackson County. Previous studies in Douglas County have shown that mercury concentrations are consistently well below the Oregon Standard for Drinking Water in areas of cinnabar deposits (Robert E. Meyer Consultants, Inc. 1978). Transmission line construction would not result in a measurable change in mercury concentrations of affected streams (Carter 1982).

An additional potential impact of the transmission line is herbicide contamination of water bodies, discussed in Chapter 1. Based on the standard procedures presented in Chapter 1, stream quality is not expected to be affected by herbicide use. For a further analysis of vegetation management impacts see the BLM Vegetation Management EIS and supporting annual environmental assessments (USDI BLM 1978c).

None of the alternatives or options cross any navigable waters of the United States as defined by the Corps of Engineers (Steckler 1981), precluding the need for a Section 10 permit under the Rivers and Harbors Act of 1899 (Section 10.33 U.S.C. 103). A state permit required by the Oregon Division of State Lands would be obtained if more than 50 cubic yards of material is expected to be dredged, moved, or placed within the bankfull stages of any waterway of the State, regardless of navigability (Akers 1982). Other regulatory concerns relate to the potential for chemicals or other discharges to affect water resources. This should not be a concern because Pacific and BPA comply with federal, state, and local regulations pertaining to herbicides, insecticides, fungicides, and rodenticides used in their construction and maintenance activities. These regulations include those enforcing the Federal Insecticide, Fungicide, and Rodenticide Act (as amended) (40 CFR, Part 162); those for acceptance of certain pesticides and their use, storage, and disposal (40 CFR, Part 165); and those for protection of workers handling such pesticides (40 CFR, Part 170). Chapter V of the BPA Right-of-Way Management Standards (No. 63040-50) specifically spells out various procedures and practices used by BPA to maintain compliance with various Federal regulations.

Another substance of concern to Pacific and BPA, primarily because it is a health hazard and can contaminate water resources, is polychlorinated biphenyls (PCBs). Their processing, distribution, and use is regulated under the Toxic Substances Control Act (40 CFR, Part 761). EPA regulations on PCBs directly affect Pacific and BPA because PCBs in the past have been used as cooling and insulating agents for substation transformers and capacitors. If the no action alternative is chosen, such equipment may be needed to maintain service. For this alternative, new transformers and capacitors which would eventually be needed would not contain PCB compounds.

Pacific and BPA take care to avoid accidents or spills of pesticides, petroleum products, and other hazardous substances. In the event of a spill, however, BPA and Pacific comply with regulations governing the treatment and disposal of such substances. Depending on the substance and whether it is spilled on land or water, regulations under the Clean Water Act, the Resource Conservation and Recovery Act, the Toxic Substances Control Act, and the Federal Insecticide, Fungicide, and Rodenticide Act (as amended) may be applicable.

A Section 404 permit (Clean Water Act, 33 U.S.C. 1344) from the U.S. Army Corps of Engineers could be required at any of the river crossing sites if fill material, including poured concrete, is placed waterward of the ordinary high water line or in adjacent wetlands. Until all tower sites and access roads are identified, specific places where a permit may be required are unknown.

The types of solid waste generated during construction and operation of transmission lines can be classified as clearing waste, construction waste, domestic (municipal) waste, and problem wastes. These wastes would be collected, transported, stored, and disposed of according to applicable federal and state laws, regulations, and guidelines as required under the Solid Waste Disposal Act and Resource Conservation and Recovery Act. Domestic and construction solid waste generated would be disposed of in a state approved landfill. The quantities of these wastes would be small and would not adversely affect the landfill. Certain portions (metal, rubber, and paper) would be recovered for sale and reprocessed where practical.

Coastal Zone Management Program considerations are not applicable because the project area is not within the coastal zone and would not significantly affect coastal zone resources. This project would not affect a domestic water supply or a sole source aquifer as defined in Section 1424(e) of the Safe Drinking Water Act (Federal Register, February 9, 1978).

ALTERNATIVES

The draft preferred alternative would result in approximately 2,700 tons/yr of additional sediment yield during the first year after construction. The impact of this additional sediment would be greatest in the small streams adjacent to the corridor. An example of this situation is Packard Creek (seven miles south of the South Umpqua crossing) which parallels the corridor for most of its length (2 miles). The total existing sediment yield to this watershed is estimated to be approximately 750 tons/yr based on Soil Conservation Service sediment yield maps (Oregon Department of Environmental Quality 1978). The additional sediment yield from construction of the preferred alternative (replacement of the existing line) would be approximately 23 tons/yr, or an increase of three percent. Sediment yield would genrally be greater where the corridor represents a new

alignment, rather than replacing or paralleling an existing line. An example of a watershed crossed by a new alignment would be Yankee Creek, four miles northeast of the Meridian Substation. Sediment yield in this watershed would increase from approximately 2520 to 2640 tons/yr the first year after construction, an increase of less than five percent, indicating that, in general, sediment yield impacts to streams would be insignificant. Because these calculations have been based on generalized sediment yield values, isolated areas of highly erodible soils, such as near West Fork Evans Creek, would have higher local sedimentation rates. The expected sedimentation rates are difficult to quantify in granitic soils, but water quality impacts are expected to be moderately significant because of the longer duration of the impacts (more than 3 years) and the greater impact intensity expected in this area relative to the remainder of the route. The road construction procedures outlined in the MFPs (USDI BLM 1978b, 1979b, 1980) and the State Site Certificate would be used to minimize sedimentation rates in this area. Water quality impacts on the remainder of the route would be insignificant.

Alternative 2, the parallel alternative, would result in approximately 2,900 tons/yr of additional sediment yield during the first year after construction relative to existing conditions. This would be an insignificant impact, except in the West Fork Evans Creek area for the same reason described above.

Alternative 3, the double circuit alternative, would require the same access road mileage and clearing as the draft preferred alternative and would result in identical impacts.

Alternative 4, the new preferred alternative, would result in approximately 1,810 tons/yr of additional sediment yield during the first year, as indicated by the figures below for Options C and I.

OPTIONS

Options A through F would not cross any major water bodies. Therefore, the options which minimize the length of new and upgraded access roads would have the lowest water resources impacts as discussed in the soils section. Sediment yield is estimated to be greater for the option than for the corresponding portion of the draft preferred alternative for Options B and D (80 and 20 tons/yr during the first year, respectively). Less sediment yield is expected for Options A, C, E, and F (10, 35, 85, and 240 tons/yr during the first year, respectively) than for the corresponding portion of the draft preferred alternative. The water quality impacts of each of these options would be insignificant in terms of intensity and duration, as defined earlier in this section.

Option G, as well as the modified Option G, West Fork Evans Creek to Ramsey Canyon, would have a direct impact on the West Fork of Evans Creek. Water quality problems already exist in this creek (Oregon Department of Environmental Quality 1978), due in part to the highly erodible granitic soils upstream and previous logging operations. Option G involves following the existing corridor along the creek bed for approximately 3 miles, whereas the preferred alternative would

traverse ridges 1/2 mile to the northeast of the creek. Modified Option G consists of portions of these routes. Sediment yields are expected to be approximately 115 tons less for Option G and 70 tons less for modified Option G than for the draft preferred alternative during the first year. Based on the criteria defined earlier in this section, water quality impacts would be insignificant for this option.

Option H, the Medford Basin west route, is expected to result in approximately 184 tons/yr less sediment yield than the draft preferred alternative. Water quality would not be significantly affected.

Option I, the new preferred alternative routing along the existing corridor through Medford Basin, is expected to result in approximately 780 tons/yr less sediment yield than the draft preferred alternative. Water quality impacts would be insignificant.

Option J, an underwater crossing at the Rogue River, would cause elevated suspended sediment levels during the construction phase due to dredging for cable burial. An accidental rupture of the cable or oil spill would result in contamination of the river with cable oil. The chances of such a rupture, however, are estimated to be very low, less than one rupture during the life of the project (USDOE BPA 1981b). Available evidence indicates that the cable oils potentially used are low in toxicity (Feng 1971, Azzola 1973). Water quality impacts for this option would be moderately significant during the construction phase because increased sedimentation could damage fish habitat. Water quality impacts for transmission line maintenance would be insignificant.

The impacts associated with Options K, L, and M would be identical to those of the draft preferred alternative, Option H and Option I, respectively. However, each option also has a potential further impact associated with future development. This impact is not possible to assess without detailed design information, but would be similar to the impacts described above for the proposed construction activities.

VEGETATION

All project alternatives and most project options would cause vegetation impacts in agricultural land, grassland, forest land (including oak and coniferous forest), and riparian and wetland areas to varying degrees. Vegetation impacts in agricultural land and grassland would be limited to areas needed for construction equipment access, construction pads, and tower sites. Impacts on forest land, however, would be more extensive because of the added requirement for vegetation clearing to maintain minimum conductor and tower clearance with adjacent vegetation. Impacts to riparian and wetland areas along the route are avoidable to a large extent because most of these areas are small and can be spanned, and only tall vegetation which represents a hazard to the towers or conductors would be removed.

Most of the areas required for construction access, construction pads, and tower sites in agricultural land and grassland would experience

only short-term impacts because little vegetation clearing would be necessary. Approximately three acres of vegetation would be cleared in agricultural land and grassland for construction pads (two acres) and tower sites (one acre). Revegetation would occur on these sites, except for the areas occupied by tower foundations, within one to three years. No permanent access roads would be constructed in agricultural lands. A limited amount of new access roads would be constructed in grasslands requiring complete vegetation clearing and producing long-term impacts on these lands. Because of the small amount of disturbance in these areas and the short-term nature of most disturbance, vegetation impacts in agricultural and grasslands would be insignificant.

Much of the forest vegetation occupying the right-of-way would be permanently converted to a low-growing early successional plant community containing lower structural diversity, by clearing trees and subsequent control of tall-growing species. Current right-of-way management policy allows for greater structural diversity of vegetation than in the past because only tall vegetation that would potentially interfere with the conductors or towers is removed. Understory vegetation would not be cleared, but would experience some damage as a result of logging and slash burning activities. Existing access roads would be upgraded and new access roads would be constructed as required to provide for construction equipment access in forest lands. Access road construction would result in the long-term loss of all vegetation cover. All vegetation would also be cleared from limited areas for construction pads and tower sites. Regrowth of low-growing vegetation would be permitted on most of this area. Forest clearing would not be concentrated in large blocks, but would be distributed within a narrow corridor along the 147-mile route. Also, most of the forest lands potentially affected are represented by second-growth and recently cleared forests, which are abundant throughout the project area. Therefore, impacts to forest vegetation would not be significant in a regional sense.

Riparian and wetland vegetation (see glossary) comprises a small proportion of the vegetation potentially affected by the project. A limited area of riparian vegetation would need to be cleared of tall vegetation. Since many of these areas occupy valley bottoms which can be spanned without clearing, it is likely that the area requiring clearing would be minimized. Construction pads would not be located in riparian areas but towers would be sited in these areas where necessary. With the possible exception of the Rogue River crossing, all wetlands crossed are small enough to be spanned so that tower sites would not be located in them. No filling of wetlands would be required. Small perennial and intermittent streams may require the installation of culverts for access road construction. Overall, riparian and wetland vegetation impacts would be insignificant because: 1) the amount of disturbance would be low relative to the availability of similar vegetation in the area; 2) the intensity of the disturbance would be low; and 3) most disturbance would occur adjacent to and existing cleared corridor.

Control of tall-growing vegetation within the right-of-way in forest and riparian areas would be practiced during operation. Selective cutting and herbicides may be used for this purpose. Aerial application of herbicides would not be used except, possibly, in the segment of the line to be constructed by BPA. Because of the controls and safeguards to be applied to herbicide use (as described in the Standard Design Features Section of Chapter 1) and the limited extent of herbicide use expected, effects of vegetation control on adjacent nontarget vegetation are expected to be negligible.

No plants officially listed or proposed for listing as threatened or endangered under the Endangered Species Act occur in the project area (Blum 1981). However, based on review of existing information, 23 species identified as candidates for listing (Federal Register, December 15, 1980 pages 82480 to 82569), at least potentially occur in the project area. Field surveys were conducted during summer 1981 to identify if and where these species occur along the existing corridor. New alignment segments of the preferred route were not surveyed since these were identified too late to be included in the summer surveys. Based on the field surveys and literature review, occurrence of eight species was judged very unlikely and two species were confirmed to exist within the right-of-way of the preferred alternative and Alternatives 2 and 3 (Table 3-3) (see Section 5.0, Technical Investigations Report).

ALTERNATIVES

The draft preferred alternative and Alternatives 2 and 3 would traverse approximately 14.8 miles of agricultural land, 16.5 miles of grassland, 112.4 miles of forest land, and 1.7 miles of riparian and wetland areas (plus 1.4 miles of urban areas). Clearing and new access road requirements are summarized for these three alternatives and Alternative 4 in Table 3-1.

Draft Preferred Alternative

Minimal vegetation impacts would occur in agricultural and grassland as a result of the draft preferred alternative. Approximately 3 acres of vegetation would be cleared in these areas for construction pads and tower sites and about 7-1/2 miles of new access roads would be constructed in grasslands.

Trees and other tall vegetation would be cleared on approximately 790 acres of forest land for conductor clearance. Forty-nine percent of this acreage would occur along the segment between Dixonville and Ramsey Canyon and 45 percent between Ramsey Canyon and the Meridian Substation. Approximately 37 of the acres to be cleared are covered by forests of older seral stages. An estimated 109 miles of new access roads would be constructed, requiring an additional 113 acres within cleared right-of-way and 72 acres in uncleared forest land. All vegetation on about 20 acres within the cleared right-of-way would also be cleared for construction pads and tower sites.

TABLE 3-3

CANDIDATE THREATENED OR ENDANGERED PLANTS POTENTIALLY OCCURRING IN THE PROJECT AREA

Species	Probability of Occurrence On Right-Of-Way Not Found During Surveys: Occurrence Is Very Unlikely	Probability of Occurrence On Right-Of-Way Not Found During Surveys: Occurrence Is Possible	Found On R/W During Surveys
Agrostis microphylla var. hendersonii		X	
Arabis koehleri var. koehleri	X		
Arabis koehleri var. stipitata	X		
Aster vialis		X	
Cypripedium montanum		X	
Erigeron decumbens	X		
Fritillaria gentneri		X	
Lewisia cotyledon var. howellii	X		
Limnanthes floccosa ssp. grandiflora		X	
Limnanthes floccosa ssp. pumila	X		
Limnanthes gracilis var. gracilis		X	
Lomatium bradshawii		X	
Perideridia erythrorhiza		X	
Phacelia capitata			X
Phacelia verna		X	
Plagiobothrys hirtus var. corallicarpa	X		
Plagiobothrys hirtus ssp. hirtus		X	
Romanzoffia thompsonii/ sp. nov. ined.		X	
Sidalcea campestris			X
Sidalcea cusickii		X	
Sidalcea nelsoniana		X	
Synthyris missurica ssp. hirsuta/ined.	X		
Thlaspi montanum var. siskiyouense	X		

A maximum of 12 acres would be cleared of tall vegetation and 1.1 miles of new access roads would be constructed within riparian areas along the draft preferred alternative. Less than 1/2 acre of wetlands would be affected by clearing, access roads, and tower sites, primarily at the Rogue River crossing (see Wetlands Section following).

A large population of the candidate threatened or endangered plant species -- Phacelia capitata was found to occur within the existing right-of-way on forest land near Brushy Butte, south of Dixonville (Figure 2-2). This low-growing perennial appears to be slowly expanding its population size on serpentine soils primarily within the cleared portion of the right-of-way in this area. The local distribution of the species extends south from Brushy Butte along the right-of-way for about 1 mile. The following special precautions would be taken to minimize impacts to this population.

New access road routes and construction pad and tower locations would be selected to avoid plant concentration areas. This would be accomplished by an on-the-ground review of detailed construction plans by a botanist, followed by modification of these plans where necessary prior to initiation of any construction activity. The same process would be followed where plant concentrations are found on existing access roads. Herbicide use for future vegetation control in this area would be curtailed.

Although some individual plants would likely be killed as a result of construction activities, the mitigation measures described above would ensure that concentration areas are avoided and thus impacts to this population would be insignificant. In the long-term, because available data indicates that the species prefers open areas, widening of the cleared right-of-way may have a positive impact on the population by increasing the area of suitable habitat.

The second candidate species found within the existing right-of-way is Sidalcea campestris. Several plants of this perennial species were found along the banks of a small stream which crosses the existing right-of-way on agricultural land near Camas Swale (Figure 2-1). Individual plants of this species were also found at scattered locations within the Camas Swale area and south to Cottage Grove. Because special precautions would be taken (as described above) near the small stream in the Camas Swale area, impacts to Sidalcea campestris should be avoided.

Alternative 2

Transmission line development under Alternative 2 (parallel) would produce greater vegetation impacts relative to the draft preferred alternative, but these would still be insignificant. This alternative would require acquisition of more right-of-way, clearing of more land, and construction of more miles of new access roads than any of the alternatives. Area requirements for construction pads and tower sites

would be similar to the draft preferred alternative. Approximately 36 percent of the 1,539 forest acres to be cleared for right-of-way occurs between Lane Substation and Dixonville, 41 percent occurs between Dixonville and Ramsey Canyon, and 23 percent occurs between Ramsey Canyon and Meridian Substation.

Approximately 38 acres of old-growth forest and a maximum of 17 acres of riparian areas would be cleared of tall vegetation under this alternative. Impacts to wetlands would be similar to those of the draft preferred alternative. Adverse impacts to Phacelia capitata and Sidalcea campestris would be insignificant because of the measures described above. In the long-term, Phacelia capitata may be beneficially affected due to the creation of additional suitable habitat.

Alternative 3

Vegetation impacts as a result of Alternative 3 (double circuit) would be essentially the same as for the draft preferred alternative. However, in the long term, if an additional 500 kV line is needed between Eugene and Medford, the cumulative impacts of two sets of 500 kV lines on double-circuit towers would be considerably less than if two parallel single circuits were constructed.

Alternative 4

Alternative 4, the new preferred alternative, would result in lower overall impacts to vegetation than would the draft preferred alternative. Vegetation clearing for this alternative would be about 60 percent of that required for the draft preferred alternative. The route of Alternative 4 includes one additional site of a candidate threatened or endangered species occurrence, as described below for Option I, but impacts to this species could be avoided.

OPTIONS

The various options (A through M) would each alter the extent of vegetation impacts. The area of new right-of-way, the area of new cleared right-of-way, and the length of new access roads required for each option are compared by land cover type with that required by the segment of the draft preferred alternative replaced by each option in Table 3.2 The most substantial reductions in total vegetation impacts are produced by Options I (part of the new preferred alternative), H, F, and A (in decreasing order), while the only substantial increase in vegetation impacts is produced by Option B. Options E, F, G, and modified Option G would reduce the amount of old-growth forest clearing by about 5, 4, 11 and 1 acre, respectively. Option H would increase old-growth clearing by about 10 acres.

None of the options would alter impacts to the two candidate threatened or endangered plants confirmed to occur on the preferred route. However, another candidate plant -- Limnanthes floccosa ssp. grandiflora -- is expected to occur along Options H, I, L, and M in the White City-Agate Desert area. This plant occurs only around the edges

of vernal pools in this locale. Collection records indicate its presence in the immediate vicinity of the route and suitable habitat was observed within the existing right-of-way during field surveys in this area. Because special precautions would be taken (as described above) in this area, impacts to this species should be avoided. Also, transmission line development under these options would impact the unique flora that occurs in the Agate Desert area (Oregon Natural Heritage Program 1977). However, because of the limited amount of vegetation clearing required in this area, impacts are not expected to be significant, especially because care would be taken to avoid vernal pools.

The impacts associated with Options K, L, and M would be the same as those of the corresponding portion of the draft preferred alternative, Option H, and Option I, respectively, for the first 10 or 20 years following construction. However, in approximately the late 1990's or early 2000's a second 500 kV line may be built. When this occurs the additional clearing and access road construction identified in Table 1-2 as Potential Future Requirements would occur, resulting in additional vegetation impacts.

WETLANDS

The effects of the various project alternatives and options on wetlands are discussed in previous paragraphs of this section and in the Water Resources, Wildlife and Visual Resources Sections. Because wetlands impacts are of special concern, wetlands effects are summarized here. Pursuant to Executive Order 11990, transmission line facilities would not be located in wetlands unless there is no practicable alternative.

Project area wetlands were identified by examination of U.S. Fish and Wildlife Service National Wetland Inventory Maps (these were available for only a portion of the project area), U.S. Geological Survey maps, color aerial photographs, and field reconnaissance surveys (see Technical Investigations Report, Section 3.0). Although many wetlands are crossed by the various project alternatives and options, most of these are very narrow (i.e., less than 100 feet across), occurring along small streams, and can easily be spanned. Since these areas contain little tall vegetation and occur in valley bottoms, only negligible vegetation clearing would be required. Access roads, which cross these areas, would be upgraded or constructed at some locations and culverts may need to be installed in some small, perennial, and intermittent streams. Although the potential effects of sedimentation resulting from construction on the water quality and substrate of streams in the project area may be important (See Water Resources Section), the other effects of road construction on these wetlands would be insignificant because of the very localized nature of the impacts relative to the length of these wetlands.

The only wetlands crossed that are wider than about 100 feet are the North and South Umpqua River crossings, a sedge-dominated wetland adjacent to a small reservoir just south of the North Umpqua River crossing, and the two alternative Rogue River crossings. All of these wetlands would be spanned by transmission line development and would not require new access road construction except for the draft preferred alternative crossing of the Rogue River.

The existing corridor crossing of the Rogue River (in the new preferred alternative) would span a relatively large wetland and it may be necessary to locate one tower in the drier portion of the wetland. Because little tall vegetation exists within the right-of-way of this alternative crossing, at most several small black cottonwoods would have to be cut for conductor clearance. Also, because of the lack of construction activity within or immediately adjacent to water bodies in this wetland and the flat topography of the area, erosion and sedimentation impacts are expected to be negligible. The incremental visual impacts of adding a 500 kV line to the existing corridor across this wetland are not expected to be significant (see Visual Resources Section). Overall, impacts to this wetland are expected to be insignificant because of the small area affected relative to the size of this wetland, and because disturbance would occur within or adjacent to an existing corridor.

One transmission line tower would probably be located within a wetland on the east side of the draft preferred alternative Rogue River crossing. This seasonally flooded gravel bar site is dominated by black cottonwoods and willows and is adjacent to a more extensive tract of riparian woodland. The wooded portion of this wetland covers about 10 acres. Less than one-half acre of wetland vegetation would be cleared of tall vegetation for conductor clearance. In addition, approximately one-tenth mile of access road would be constructed for access to the tower site. Erosion and sedimentation impacts are expected to be negligible for the reasons identified for the existing corridor Rogue River crossing. The overall effects of these activities on this wetland are expected to be insignificant because of the small areas affected relative to the size of this wetland and because similar areas commonly occur along the river in this area. However, visual resource impacts due to 500 kV transmission line development across this wetland would be moderately or highly significant depending on the alternative and option selected (see Visual Resources Section).

Because of the limited effects on wetland vegetation, impacts on waterfowl nesting and rearing habitat would be insignificant. In addition to the direct effects on waterfowl habitat, spanning wetlands with overhead transmission lines produces a collision hazard to waterfowl. This hazard would be highest at the larger wetland crossings. Although it is likely that some waterfowl would be killed as a result of collisions, the overall impact is not expected to be biologically significant (see Wildlife Section).

As noted above, the only wetlands in which project structures would be placed are those at the Rogue River crossing. No construction alternatives exist that would avoid this crossing without greatly

increasing the length of the line. It would be possible to avoid tower placement in these wetlands by increasing tower height, which would permit a greater setback from the river. However, this would result in increased project costs and would increase visual impacts. This modification does not appear to be justified based on the minimal impacts associated with locating a single tower within these wetlands.

Undergrounding the draft preferred alternative Rogue River crossing (Option J) would modify less vegetation and wildlife habitat within the wetland at this crossing than overhead construction, and revegetation would occur. Undergrounding at the existing corridor Rogue River crossing would temporarily increase vegetation and wildlife habitat loss. Approximately 0.8 acre of wetland would be cleared during construction at this location. However, revegetation of this cleared area would occur in less than 1 year following construction. Underground construction would eliminate the potential for waterfowl collisions with conductors and substantially decrease visual impacts, but would increase the potential for water quality impacts. Overall, however, wetland impacts as a result of undergrounding the Rogue River crossing are not expected to be significant at either crossing due to the limited areas potentially affected relative to the size of the wetlands involved, the frequency of occurrence of similar wetlands along the Rogue River in this area, and the short-term nature of the wetland impacts.

WILDLIFE

One of the the greatest impacts to wildlife resulting from the draft preferred alternative and Alternatives 2, 3, and 4 would be habitat modification resulting from vegetation clearing within the right-of-way (Table 3-1). Impacts in agricultural and grassland habitats would not be significant because of the limited area directly affected. Similarly, impacts to riparian and wetland habitats would be insignificant because of the limited area involved and since clearing in these areas can be avoided to a large extent. Forest habitats would experience the greatest impacts because clearing is necessary not only for access roads, construction pads, and tower sites, but also to maintain minimum conductor clearance with adjacent vegetation. Therefore, low-growing, early successional plant communities would exist within a large portion of the right-of-way now containing forests. As a result of this forest habitat loss, populations of those forest-inhabiting species that do not significantly utilize early successional or forest edge habitats may decline. Examples of these species include the marten, northern flying squirrel, goshawk, and several species of owls, woodpeckers, songbirds, and small mammals. However, forest habitat clearing would not be concentrated in large blocks, but would be distributed within a narrow corridor throughout the 147-mile route. Also, the great majority of the forest lands potentially affected are occupied by second-growth and recently cleared forests, which are abundant throughout the project area. Therefore, impacts to forest wildlife, in general, are not expected to be significant in a regional sense.

Habitat modification in forested areas would also benefit some wildlife species. Because right-of-way construction in extensive forested areas creates a new habitat dominated by low-growing vegetation and increases the amount of edge, habitat diversity is increased along the right-of-way (Maser et al. 1979). There is also evidence to indicate that where diversity has been created by a right-of-way, wildlife species diversity increases with increasing right-of-way width (Anderson et al. 1977, Schreiber and Graves 1977), suggesting that widening of the existing right-of-way along replacement and parallel portions of the route would also benefit certain species. Species that would benefit from the widening are those that prefer early successional habitats such as the brush rabbit, mountain quail, and certain songbirds and small mammals.

The overall impact of forest habitat clearing on species that utilize a variety of successional stages is difficult to predict. For example, black-tailed deer utilize dense timber for hiding and thermal cover, while early successional habitats provide a more concentrated food supply. Right-of-way clearing is likely to benefit this species in areas along the route where food supply is limited and have an adverse effect in areas with limited cover. Other species, such as many mammalian predators (e.g., bobcat, cougar, and coyote) are wide-ranging with broad habitat requirements. Again, however, because right-of-way clearing would not occur in large blocks, but would be distributed within a narrow corridor extending over a large area, habitat modification impacts on these species are not likely to be significant whether negative or positive.

Construction of new access roads is another source of wildlife impacts. The area covered by access roads represents lost habitat to nearly all species concerned (Table 3-2). However, the greatest long-term impact on wildlife resulting from access road construction may be increased human access and increased use of previously remote areas (Davey 1974). Big game mammals, large predatory birds and mammals, and wild turkeys (in the Medford area) are the species most likely to be affected. Increased vehicular access intensifies fishing, hunting, and trapping pressures (Maser et al. 1979) and harassment of wildlife (Ellis et al. 1969). Impacts would be greatest along those segments where new alignments are to be followed. These include the three realignment segments between Canyonville and Ramsey Canyon and the entire segment between Ramsey Canyon and the Meridian Substation. Gates would be installed at many access points on public and private land but these generally are only partially effective at restricting vehicular access, especially by trailbikes, snowmobiles, and four-wheel drive vehicles. The three realigned segments between Canyonville and Ramsey Canyon across commercial forest land and already contain a relatively high density of roads; no point along these corridor sections is more than about one-half mile from an existing road. The 27 miles of the Ramsey Canyon to Meridian Substation segment, however, are crossed by few existing roads. Transmission line development along this route would provide access to much of the remote area where many points along the corridor are presently more than 1 mile from an existing road. The potential frequency of human access is also expected to be higher in this segment because of its proximity to a heavily populated area and its lack of very rugged topography. The 64

miles of new access roads that would be built in this segment would also result in the long-term loss of 108 acres of wildlife habitat. For these reasons the cumulative effects of access road construction on wildlife are expected to be moderately significant in this segment. The length of new access roads constructed in new alignment corridors provides an indication of the relative severity of this impact among the various alternatives and options. These are provided in Tables 1-4, 1-5, and 1-6.

Project construction would also have a short-term impact on wildlife, particularly big game mammals and large predatory birds and mammals, during the construction phase as a result of disturbance from human activities and construction equipment. Many species occurring along the right-of-way would temporarily leave the area or otherwise modify their behavior until construction activities ceased. Construction during the spring and early summer season may negatively affect the breeding success of some species. If construction activities occur during late winter, disturbance impacts would be relatively high; however, construction activities are not expected to be scheduled during this period.

Wildlife impacts resulting from the corona effect and electric or magnetic fields are also a theoretical possibility as a result of operation of the proposed line, but so little is known about the effects of these phenomena on wildlife that the impacts, if any, are difficult to assess. The available information indicates that adverse effects on wildlife have not been conclusively proven (Goodwin 1975, Bankoske et al. 1976).

Use of herbicides for vegetation control within rights-of-way is another potential source of fish and wildlife impacts due to exposure to toxic chemicals. However, exposure to acute toxicity levels is not expected to occur because only EPA-registered herbicides would be used that would not reach toxic exposure levels when used in accordance with the manufacturer's prescription. Also, chronic effects are not expected because of the unlikelihood of repeated exposures to individual animals due to the infrequent application rate anticiated. Controls and safeguards concerning herbicide use are described in the Standard Design Features Section of Chapter 1.

Virtually the entire project area is used as winter range by black-tailed deer. The BLM (1979c) has identified 11 areas as "crucial black-tailed deer winter ranges" in the Jackson and Klamath Sustained Yield Units of the Medford District. Three of these areas are crossed by the draft preferred alternative and Alternatives 2 and 3 (Figure 2-1). These areas are defined as low elevation lands in which deer concentrate during severe winters (Oakley 1981). New right-of-way clearing in these areas would have a positive impact on deer by promoting and production of high quality forage plants in narrow corridors and increasing the amount of habitat edge. This positive effect may be overshadowed in the West Fork Evans Creek winter range by

the loss of cover which would result from right-of-way construction since this winter range has been extensively logged in recent years. The positive and negative effects of right-of-way clearing in these winter ranges are not expected to be significant because less than one percent of each winter range would be cleared under all alternatives. The construction of new access roads in new alignment segments and the resulting increased human access would negatively impact deer on all winter ranges, especially during severe winters when the animals are concentrated and already under considerable stress. However, these new alignment segments are mostly on private lands on which access is likely to be controlled and which already contain some existing roads. Therefore, this impact is also not expected to be significant.

Spotted owl habitat may be impacted as a result of new right-of-way clearing south of Canyonville. Three spotted owl pairs are known to occur within 2 miles of the draft preferred alternative and Alternatives 2, 3, and 4 in this area and two of these pairs occur within 1 mile (Figure 2-1). The BLM has proposed that approximately 4,000 acres surrounding these three pairs be designated as a Spotted Owl Management Area (Lint 1981c). Approximately two miles of the draft preferred alternative and Alternative 2, 3, and 4 would traverse this proposed management area. Because the forest habitat to be cleared under each alternative would represent less than 1 percent of the proposed management area, would occur at least one-quarter mile from the pair activity centers, and would mostly involve widening an existing cleared right-of-way, the spotted owl population is not expected to be reduced in this area (Lint 1981c).

Although extensive spotted owl surveys have been performed throughout much of western Oregon, it is possible that other, not yet located, pairs may occur near the route. Because of the limited amount of old-growth habitat available, however, it is doubtful that more than one or two additional pairs occupy areas in proximity to the route.

The potential for waterfowl mortalities as a result of collisions with conductors or overhead groundwires exists, but is not expected to be significant because of the lack of major waterfowl concentration areas along the preferred route. Greatest potential for collisions would be at the proposed crossings of the North Umpqua, South Umpqua, and Rogue Rivers, and near a small reservoir just south of the North Umpqua crossing. A study conducted for BPA indicated that transmission lines caused some alterations in bird flight behavior (Meyer 1978). Most waterfowl, however, crossed well above transmission line height and less than 1 percent of waterfowl observed altered their flight path to avoid flying across the line. Studies of 500 kV, 230 kV, and 115 kV transmission lines at several sites in Oregon and Washington have shown that less than 1 percent of those birds flying at or below ground wire height collided with the lines (James and Haak 1979, Meyer and Lee 1981). Most of these collisions were believed to occur with the small overhead ground wires rather than the larger, more visible conductors. Several BPA-sponsored studies of transmission line collision mortality

have been conducted in recent years at ten sites in Oregon and Washington (Lee 1978, Meyer 1978, James and Haak 1979, James 1980, Willdan Associates 1981, Beaulaurier 1981). Several of these sites were selected to represent "worst case" situations because of the frequent presence of large numbers of waterfowl and other birds (Meyer and Lee 1981). To date, however, the levels of avian mortality from collision with the lines studied have not been biologically significant (Beaulaurier et al. 1982). Similar results are expected with this project, especially since no large concentrations of waterfowl occur along the various project routes.

Limited amounts of waterfowl nesting and rearing habitat occur in wetlands within the project area. Because project impacts on wetlands are expected to be minimal, impacts on waterfowl nesting and rearing habitat are expected to be insignificant.

The draft preferred alternative and Alternatives 2, 3, and 4 traverse the range of the Roseburg population of Columbian white-tailed deer, which presently numbers about 2,000 to 2,500 animals (Smith 1981a). This subspecies is classified as endangered under the Endangered Species Act of 1973. As required by the Act, BLM has assessed the potential for impact to this population and concluded that no biologically significant impacts would occur as a result of the project due to the limited amount of habitat disruption expected compared with the total range of the population (465 square miles). BLM's biological assessment has been submitted to the USFWS for concurrence and consultation. BLM's assessment, however, concluded that the clearing required by Alternative 2 may have an insignificant negative effect on the deer. In addition, the BLM's assessment concluded that because the oak woodlands near the North Umpqua River are heavily used for fawning by the subspecies (Smith 1981b), construction activities during May 15 to July 15 may have a negative, but insignificant, effect on fawning success in this area. Current construction schedules do not include plans for activities within 1 mile of the North Umpqua River crossing between May 15 and June 15, as construction would proceed south from Spencer Switching Station. If, due to unforeseen circumstances, this schedule could not be used, Pacific would agree to a determination by the Oregon Department of Fish and Wildlife or the U.S. Fish and Wildlife Service upon their review, prior to construction, that construction should be suspended during this time period.

The bald eagle, which is Federally listed as threatened in Oregon, also occurs in the project area on a seasonal basis. It regularly occurs during the winter and spring and fall migration periods along Fern Ridge and Cottage Grove Reservoirs, and the Coast Fork Willamette, North Umpqua, South Umpqua, and Rouge Rivers and adjacent areas. Observations have also been made in the spring and summer in some of these areas and nesting is suspected but not verified at Fern Ridge Reservoir (Greer 1981), at Kelly Slough along the Rogue River (Oregon National Heritage Program 1977), and northeast of Medford between Agate Reservoir and 2 miles east of Yankee Reservoir (Werner 1982). No roost

sites are known to occur near any of the alternative or optional routes. BLM has prepared a biological assessment of the potential for project impact to bald eagles. This assessment concluded that the project would not affect bald eagles because no known nest or roost sites would be disturbed, a negligible proportion of the habitat used by eagles in the project area would be modified, eagle electrocution is not a problem with 500 kV lines, and the potential for collisions with conductors or groundwires is expected to be low. BLM's biological assessment has been submitted to the USFWS for concurrence.

Other species identified as Oregon Species of Special Concern (Donaldson 1979) may occur in the project area (see Technical Investigations Report, Section 5.0), but are not expected to be significantly impacted. These species include the pika, ringtail, fisher, and sharp-tailed snake. The pika probably inhabits talus slopes below cliffs in the southern portion of the project area. However, these areas would not be selected for tower siting or access road construction and thus, would experience negligible habitat disruption. The ringtail and fisher may also occur in the southern portion of the project area. Because the ringtail has very broad habitat requirements and the fisher occupies very large home ranges, the minimal habitat modification per mile of line is not expected to significantly affect these species. Although the sharp-tailed snake exists within the project area, no populations are known to inhabit the areas potentially affected by the project. In addition, the extent of habitat modification would be negligible in comparison with the local distribution of the species in western Oregon.

Increased levels of stream sedimentation can cause accumulation of bottom sediments which can impact fish by reducing habitat quality for aquatic invertebrates utilized as food, and by reducing available spawning habitat. Sedimentation can also elevate suspended sediment levels and cause direct injury to fish and aquatic invertebrates (Gibbons and Salo 1973). Sedimentation as a result of this project is not, in general, expected to be significant because of the small increase in sedimentation rates expected (see Water Resources Section in this chapter). In addition, standard road construction practices (discussed previously), which include special measures for problem soils, are expected to minimize sedimentation rates. However, in localized situations, particularly in stream sections within the West Fork Evans Creek drainage, fish habitat impacts may be moderately significant. This drainage contains valuable habitat for coho salmon, summer and winter steelhead, and rainbow and cutthroat trout and has been damaged due to excessive sedimentation and removal of streamside cover as a result of road construction and logging activities in recent years (USDI BLM 1977a, 1979c). Because of the highly erodible granitic soils that occur locally in this drainage, sedimentation rates could be high. In addition, because of the difficulty in revegetating disturbed granitic soils, sedimentation rates might be high for a longer period of time than in other areas (see Water Resources Section). For these reasons impacts may be moderately significant. Highly significant

impacts are not expected because of the small area affected relative to the areas affected by recent logging and road construction in this drainage, and the special construction measures that would be taken.

The use of culverts for some small stream crossings may cause localized impacts to fish habitat due to streambed scouring (Yee and Roelofs 1980). Culverts would be installed in a manner that would not prevent fish passage in any stream sections utilized by salmonids.

ALTERNATIVES

The potential wildlife impacts of the draft preferred alternative and Alternatives 2, 3 and 4 are generically described above. Table 3-1 quantifies the extent of habitat modification produced under each alternative by land cover type. As identified in the above discussion, moderately significant wildlife impacts may occur because of: 1) habitat loss and human disturbance associated with access road construction in the Ramsey Canyon to Meridian Substation segment; and 2) sedimentation in the West Fork Evans Creek drainage. These impacts would occur for all construction alternatives. Unique aspects of the generic impacts discussed above, as well as other unique wildlife impacts are summarized below for each alternative.

Draft Preferred Alternative

Under the draft preferred alternative about 16 acres of new right-of-way would be cleared of tall vegetation within the BLM's proposed Spotted Owl Management Area near Canyonville. This limited amount of habitat modification is not expected to reduce the spotted owl population in this area (Lint 1981c). As discussed above, the draft preferred alternative is not expected to affect the Columbia white-tailed deer. Approximately 10.4 miles of access road would be constructed and 87 acres of forested right-of-way would be cleared in crucial black-tailed deer winter ranges under the draft preferred alternative. Most of the area affected would occur along the new alignment portion between the Rogue River crossing and Meridian substation.

Alternative 2

Alternative 2 (parallel alternative) would require the clearing of about 29 acres for right-of-way within the BLM's proposed Spotted Owl Management area near Canyonville. Because this represents less than one percent of the management area it is not expected to significantly affect the spotted owl population in this area. In addition to the potential for construction effects on Columbian white-tailed deer fawning success (see above), Alternative 2 may affect the species habitat. About seven acres of forest, consisting mostly of oak woodlands, would be cleared within the deer concentration area. Because these woodlands represent important habitat to the subspecies and are declining in abundance within this area (Smith 1981a) this

small amount of habitat modification may have a negative, but insignificant, effect on the population. Alternative 2 would require the construction of about 11.2 miles of access roads and the clearing of 128 acres of forested right-of-way within crucial black-tailed deer winter ranges. Most of the road construction would occur along the new alignment portion between the Rogue River crossing and Meridian Substation. The potential for waterfowl impacts as a result of collisions with conductors would be higher for Alternative 2 than for the draft preferred alternative because the new transmission line would be constructed parallel to existing lines which would remain in use, instead of replacing an existing line. However, based on the reasoning presented in the general discussion of waterfowl impacts, collision impacts are not expected to be biologically significant.

Alternative 3

Transmission line development under Alternative 3 (double circuit alternative) would produce wildlife impacts similar to those of the draft preferred alternative. The potential for waterfowl collision impacts would be higher since double circuit towers are taller than single circuit towers and since conductors are arranged vertically rather than horizontally. Again, however, based on the reasoning presented in the general discussion of waterfowl impacts, collision impacts are not expected to be significant. In the long term, if an additional 500 kV line is needed between Eugene and Medford, the cumulative wildlife impacts of two 500 kV circuits on double circuit towers would be considerably less than if two parallel single circuits were constructed.

Alternative 4

Alternative 4, the new preferred alternative, would result in lower overall impacts to wildlife than would the draft preferred alternative. This alternative would reduce the cleared right-of-way acreage in crucial deer winter range from 87 acres to 39 acres, and the length of new access roads in such crucial range from 10.4 miles to 1.0 mile. Old-growth habitat reduction wold be virtually the same as for the draft preferred alternative. A higher risk of waterfowl collision would be associated with Alternative 4, as discussed for Option I, but this effect is not expected to be significant.

OPTIONS

The various options (A through M) would each alter the extent and/or type of wildlife impacts. Table 3-2 quantifies the extent of habitat modification produced under each of these options by land cover type and compares them with the corresponding portion of the draft preferred alternative. The following discussion compares the impacts of these options in a similar manner.

Option A would have lower impacts to forest wildlife in the Eugene area relative to the draft preferred alternative by reducing the amount of forest clearing and new access road construction. Option C, the new preferred alternative routing in the Eugene area, would also create

lesser wildlife impacts, while Option B would have the opposite effect. The differences between Option D and the corresponding portion of the draft preferred alternative are negligible in terms of wildlife impacts. Options E, F, G, and the modified G would all lower impacts to forest wildlife between Canyonville and Ramsey Canyon. Impacts to big game mammals and large predatory birds and mammals would be lower because no access roads would be constructed in previously unroaded areas. Option E would also minimize the potential for spotted owl impacts and Option G would also minimize the effects of deer winter range along Evans Creek as well as the potential for sedimentation to Evans Creek.

Option H would have substantially lower impacts to wildlife associated with oak forests, but impacts to coniferous forest wildlife would be higher compared with the draft preferred alternative. Impacts to crucial deer winter range would be minimized because the two eastern winter ranges crossed by the draft preferred route would be completely avoided. Impacts due to access road construction in new alignment portions of Option H are not expected to be significant due to the steepness of the area, which inhibits human access, and the lesser amount of new access road construction relative to the draft preferred alternative. Also, this area is mostly commercial forest land which, although not heavily roaded at present, is likely to become well-roaded in the near future. Option H is expected to produce a higher potential for waterfowl collisons because greater numbers of waterfowl utilize this section of the Rogue River and the ponds and streams in the White City area along the transmission line. Although a 115 and a 230 kV line presently cross the Rogue River at this location, the conductors and ground wires of a 500 kV line would be higher than the conductors of these lines and therefore would present additional tiers of obstruction to flying birds. However, based on the reasoning provided in the general discussion of waterfowl impacts, the resultant level of mortality is not expected to be biologically significant. Approximately two miles of the Option H route traverses the Kenneth E. Denman Wildlife Management Area owned by the Oregon Department of Fish and Wildlife in the White City area. This management area provides upland game bird and waterfowl habitat. Because waterfowl nesting or rearing habitat would not be occupied by tower sites, impacts to the management area would be insignificant.

Of the six options in the Medford area, Options I (the new preferred alternative) and M would minimize habitat disruption in all land cover types, especially oak and coniferous forest, because existing transmission lines would be paralleled or replaced throughout the area. Impacts to big game mammals, large predatory birds and mammals, and wild turkeys would also be reduced because no new access roads would be constructed in previously unroaded areas. In addition, impacts to crucial deer winter range would be minimized because the two eastern winter ranges crossed by the draft preferred route would be completely avoided. Waterfowl impacts and effects on the Denman Wildlife Management Area as a result of Option I would be similar to those of Option H.

The impacts of Option J would involve more disruption of riparian habitat than overhead conductors during construction. Approximately 2 acres of riparian and wetland vegetation would be cleared during construction at either crossing site, but revegetation of most of this area would occur and long-term terrestrial impacts would be minimal. A potential also exists for suspended sediment and sedimentation impacts in the Rogue River downstream of the crossing during construction. Increased suspended sediment and sedimentation could directly cause higher mortalities of juvenile salmon and trout as well as other species, and decrease the amount and/or quality of spawning and rearing habitat. Operational impacts are expected to be negligible. An accidental rupture of the cable or oil spill could result in contamination of the river with cable oil. However, this event is expected to be highly unlikely. In addition, available evidence indicates that the cable oils potentially used are low in toxicity (Feng 1971, Azzola 1973).

The impacts associated with Options K, L, and M would be similar to the impacts of the corresponding portion of the draft preferred alternative, Option H, and Option I, respectively, for the first 10 or 20 years following construction. However, in approximately the late 1990's or early 2000's a second 500 kV line may be built. If this occurs the additional clearing and access road construction identified in Table 1-2 as Potential Future Requirements would occur. Of the three ultimate development options, Option M would minimize wildlife impacts because it minimizes access road construction, especially in previously unroaded areas, and habitat modification.

CULTURAL RESOURCES

A total of eight cultural resource sites (see Cultural Resources discussion in Chapter 2) were identified within the direct impact area of that portion of the project area (Creswell to Ramsey Canyon) subjected to on-the-ground inspection. These include two prehistoric sites in the right-of-way itself, and six historic sites outside the right-of-way but partially within the viewshed of the project.

Prehistoric sites 35D061 and 35D0199 would likely be spanned and thus not impacted by the proposal or any alternative or option. Following the decision on transmisson line location and during design, the sites which could not be avoided would be reassessed and all appropriate actions under 36 CFR Part 800 would be accomplished.

As indicated in Chapter 2, six historic sites have been identified (Powers 1982) as having characteristics which make them eligible for the National Register of Historic Places. The six sites of this caliber include the Weaver Farm, Small House, Elkhead Mines, Worthington-Trask Farm, O'Shea-Green Farm, and Stearns/Deer Park Inn. More detailed field analysis was conducted for these sites, and it was determined that the quality of these sites would not be affected directly or indirectly (i.e., visually) by any of the alternatives or options. This finding was confirmed by the SHPO (Powers 1983), who stated that the proposed project would have "no effect" upon qualities which make the above mentioned sites eligible for inclusion in the National Register of Historic Places.

Within the Eugene routing study area, none of the alternatives or Options A, B, or C would impact any previously recorded cultural resource site. Within the Medford Basin, studies conducted to date have identified over 30 sites within 3 miles of the alternative and option corridors. These sites are recorded on the State Inventory of Historic Places and Jackson County Planning Department resource maps. Sites within 3 miles of the preferred alternative include Dodge Ranch/Hannah Pottery Works (T34S, R1W, S28, and 29), Pacific and Eastern/Medco Railroad right-of-way (T35S, R1E, S18), Brownsboro Cemetery (T36S, R1E, S4), C.C. Charley House (T36S, R1E, S11), Stanley Suspension Bridge (T35S, R1E, S31), Meadows School (T34S, R2W, S21), Derby Station (T36S, R1E, S4), Little Butte Creek Bridge (T36S, R1E, S10), James William Barn and House (T35S, R1E, S31), and Antelope Creek Bridge (T36S, R1E, S19). The remaining sites which include Sams Valley School (T35S, R2W, S29); Van Hovenburg House (T35S, R3W, S25); Sams Valley Grange, Schulz House, Fredenburg House, and Pankey Cemetery (T35S, R2W, S30); Douden-Lyman House and Lyman Mountain Burial Site (T36S, R3W, S1); Sismore-Pelton House (T35S, R3W, S25); Mack House and C.C. McClendon Farm (T35S, R2W, S31); Hutchinson Water Tower (T36S, R3W, S1); Holcom Springs Resort (T35S, R3W, S23); Bybee House/Mission Bell Ranch and Bybee School (T34S, R3W, S26); Lower Table Rock and Wycliff Ranch (T35S, R2W, S9); Sanderson Farm (T35S, R2W, S31); William Payne Cabin (T35S, R1W, S13); Scott Kenyon House (T35S, R3W, S24); Table Rock Bible Church/Table Rock School, Table Rock Treaty Landmark, and Matteson House (T36S, R2W, S10); Pickens and Shelby-Tuttle House (T36S, R2W, S11); and Modoc Orchard Packing House (T36S, R2W, S12) are within 3 miles of one or several of the Medford Basin options. Standard design and construction measures (see Chapter 1 and Appendix A) would preclude disturbance of these sites. Further, most of these sites would fall outside the project viewshed and would not be affected. Others could possibly be within view of the transmission facilities, but these potential site-specific effects cannot be accurately evaluated until more detailed information is available. In all cases, standard practices (see Chapter 1 and Appendix A) would limit impacts.

Following selection of one of the corridors, and prior to initiation of design and construction activities, a detailed cultural resource survey equivalent to that conducted for the Creswell-Ramsey Canyon portion of the project would be conducted for the final project alignment in the Eugene and Medford areas. Should properties be found which are potentially eligible for the National Register, procedures and mitigation measures would be employed in accordance with 36 CFR 800.

Although BLM has attempted to identify all cultural resources within the project's direct impact area, it is recognized that additional archaeological sites might be discovered during construction. For this reason, all areas of surface disturbance in the undertaking would be monitored for previously undiscovered cultural remains. Monitoring would be done by construction crews who would be instructed to stop activities and notify their supervisors if cultural materials are encountered. In addition, the Authorized Officer would be alert for evidence of cultural sites. Should any cultural remains be discovered,

work affecting those materials would be halted until compliance with 36 CFR 800.7 is completed. Compliance with these requirements, together with the fact that only a few sites are known to exist in this area, leads to the conclusion that impacts for all alternatives and options would be insignificant. If additional sites are discovered, impacts would be limited to insignificant levels by applicable regulations.

Construction of service and access roads for those portions of the project requiring new corridors would allow access to, and potential vandalism of, archaeological sites which might be in the vicinity of the project area. Such sites would also be subject to vandalism by construction crews. While it is not possible to quantify the extent of such indirect impacts they are not considered to be great since the majority of the project is within or parallel to existing transmission corridors.

RECREATION RESOURCES

Where high-voltage transmission lines would be built across or near recreation resources, several types of adverse impacts would be possible. The construction and operation of the lines could require the removal of existing recreation facilities, such as buildings. Alternatively, the lines could directly interfere with specific recreation activities in the right-of-way, such as model airplane flying. If direct impacts would not occur, the lines could still have an indirect adverse effect on the quality of the recreation experience, usually due to visual impacts.

If any of these impacts occur, their significance can be evaluated in terms of context and intensity. In the analysis summarized here, the context of an impact is defined as the regional importance of a recreation resource or facility, determined by its degree of use, the degree of investment in the resource or the difficulty of its replacement, and the nature of the recreation use in relation to the specific type of impact. The intensity of impact is determined by the extent of recreation resources or facilities that would be removed, the extent of direct interference with recreation activity, and the degree of indirect adverse effect on recreation experience.

The probable recreation impacts of the project alternatives and options are discussed below. These impacts are summarized in the Chapter 1 comparison tables. Certain areas appear subject to several distinct types of recreation impact; this is recognized in the impact tabulations included in Chapter 1. Levels of recreation impacts are defined as high, moderate or insignificant in this table.

PARKS AND RECREATION SITES

None of the project alternatives or options would cross or pass near elements of the National Park System, National Wild and Scenic River System, National Trail System, or any federal Wilderness Areas. Options H, I, L and M pass between Upper and Lower Table Rocks. Both Table Rocks are under consideration by BLM for designation as Areas of

Critical Environmental Concern and are already designated as Outstanding Natural Areas by BLM. Impacts on these areas would be indirect, primarily visual.

Alternatives

The draft preferred alternative and Alternatives 2 and 3 would cause no significant direct impacts on recreation, although they would cross one recreation site, the Ridgeline Trail on the south edge of Eugene. These alternatives would be visible from 12 recreation sites or areas, as follows: Spencer Butte, Ridgeline Trail; Mt. Pisgah (Howard Buford Park); Cottage Grove Lake (Shortridge, Pine Meadows, and Wilson Creek recreation sites); Whistler's Bend Park on the North Umpqua River; North Myrtle Creek Park; Elderberry Flats Recreation Area; Takelma Park on the Rogue River; Agate Lake; and Roxy Ann Peak. Alternative 4 would be visible from the same areas, with the exceptions of Takelma Park and Agate Lake, and would also be visible from Hoover Ponds and the Jackson County Sports Park. Existing transmission structures and rights-of-way are not prominent in views from any of these sites, with the exception of Ridgeline Trail in Eugene (Figure C-1 in Appendix C) and the entrance area at Whistler's Bend Park. The taller steel towers of the proposed 500 kV line would be more visible than existing structures from all these sites, but would not be prominent in most views, so indirect visual impacts on the quality of recreation experience would not be significant, except as specifically discussed below. For more detail on visual effects, refer to the next section of this chapter, which discusses direct impacts on visual resources.

A moderate indirect impact on recreation would occur at the two points where the Twin Oaks-Spencer segment of the draft preferred route crosses Ridgeline Trail on the south edge of Eugene. Land is being acquired for the development of this park and trail along the ridge of the wooded South Hills. The line does not enter land acquired for park purposes at any point and the existing transmission corridor is not visible for most of the trail's length. However, where the trail joins South Willamette Street and Dillard Road and crosses the existing corridor, there are long views down the transmission right-of-way. The trail appears likely to be used by large numbers of people engaged in passive recreation, who would be sensitive to visual change. Considering the importance of this park and the incremental visual impact of adding a 500 kV double circuit line to the corridor which crosses it, the project would cause a moderate adverse effect on the quality of recreation experience despite the presence of existing lower voltage lines.

A long segment of the existing line is a prominent feature in views when leaving Whistler's Bend Park, where the corridor crosses a small bare hill close to the entrance. The existing corridor reduces the quality of the recreation experience somewhat because it conflicts with the otherwise undeveloped, rural character of this view. Both the preferred and parallel alternatives would be more intrusive than the existing lines, while the taller double-circuit towers of Alternative 3 would have even greater effects on these views and on the quality of

the recreation experience. However, impacts within the park itself would be minimal since the line is not visible from most of the park facilities along the river. For this reason, overall indirect recreation impacts on this important park would not be significant for the preferred and parallel alternatives. The more intrusive double circuit alternative would cause a significant indirect impact on recreation at the moderate level of significance.

The draft preferred alternative and Alternatives 2, 3, and 4 would be visible from the parking lot in the day use area of Elderberry Flats, a BLM day use recreation area and campground located on the West Fork of Evans Creek. The line would not be visible from picnic areas or from campsites because these are set in dense riparian woods. At a future date, nearby logging could increase the visibility of the line from some locations in the day use areas as well as from other informal recreation areas along the creek. The degree of visibility would depend upon the extent of cutting and whether buffer strips of trees were preserved around the recreation site. Although these details cannot be determined at this point, it is unlikely that the indirect impacts of the alternatives on recreation would be significant at this site.

The route of the draft preferred alternative and Alternative 2 and 3 passes several hundred feet north of Takelma Park on the Rogue River south of Shady Cove. The line would have no direct impact on recreation in the park, but would be clearly visible and prominent from the river shore and grassy meadow north of the boat launch. Despite its lack of facilities, Takelma Park has moderate importance as a recreation feature because of the access it provides to the Rogue River and the high visual quality of the river. The potential degree of impact on the quality of recreation experience is high because of the generally rural character of the area and the proximity of the transmission route.

However, the alignment of the crossing is perpendicular to most views fom the park, restricting the number of towers and length of line that could be seen. Accordingly, it appears likely that the visual effects of the draft preferred alternative would have a moderate indirect impact on recreation at Takelma Park. A parallel alternative is identical to the draft preferred alternative in this route segment. The double circuit alternative also can be expected to cause a moderate adverse impact on recreation. Figures C-13 through C-16, in Appendix C, illustrate the appearance of these alternatives as well as the degree of visual mitigation that could be obtained through the use of tubular steel towers. Pacific has agreed to establish a screen of vegetation along the banks of the selected Rogue River crossing (see Appendix A). At Takelma Park, trees and shrubs would be planted to help screen views of the line from recreation activity areas, in accordance with a planting plan which would be negotiated with the Jackson County Parks and Recreation Department. By reducing the visibility of the line, this planting would reduce its impact on recreation, although not to a level of insignificance.

Options

Of the various options, J, I (part of the new preferred alternative), L, and M in the Medford Basin would cross two recreation sites: Jackson County Sports Park and Hoover Ponds. There would be no significant direct recreation impacts at either site, as discussed below. Indirect impacts on recreation due to adverse visual effects would be possible only at those sites or parks from which the options would be visible. In addition to the sites listed above, these include Upper and Lower Table Rocks, Hoover Ponds, and Jackson County Sports Park. Indirect visual impact on recreation are discussed here only for those options assessed as likely to cause significant indirect impacts or assessed as likely to mitigate such impacts that would be caused by the corresponding portion of the draft preferred alternative.

Option B would not cross the Ridgeline Trail in the Eugene area, thus having no significant impact on recreation sites. Option C, the new preferred alternative segment from Alvey to Spencer, would also avoid crossing the Ridgeline Trail and would have no significant impact on recreation sites in the South Eugene area.

Option J, an underwater crossing of the Rogue River, would eliminate most of the long-term indirect impacts on recreation at Takelma Park because the only visible elements of the line would be the western terminal structure on the far side of Rogue River Drive and a portion of cleared right-of-way through riparian vegetation on the east side of the river. Construction-period impacts would be moderate, but temporary.

Option K, reserving additional right-of-way along the draft preferred alternative for ultimate development of a second Eugene-Medford 50 kV line, would have the same effects on recreation at Takelma Park as the preferred alternative until such time as the second line would be built.

Option I, the new preferred route in the Medford Basin, and Options H, L, and M along the existing corridor from Table Rock Switching Station to Meridian would affect four recreation sites that the draft preferred alternative avoids. The existing route is visible from both Upper and Lower Table Rocks and passes through Hoover Ponds and Medford Sports Park.

Views from the two Table Rocks, both under consideration by BLM as Areas of Critical Environmental Concern, are expansive and cover the entire Medford Basin. A 500 kV line on the north and east slopes of Lower Table Rock would generally not be prominent in views from the top of either rock and would not cause a significant indirect impact on recreation at these sites. However, if a public trail to the top of Lower Table Rock were to be developed across the transmission right-of-way, the line could also reduce the sense of isolation from urban development which appears to be part of this feature's perceived value; it is not likely that this indirect impact would be significant.

Hoover Ponds is a series of man-made retention ponds next to the existing transmission right-of-way and Route 140. No developed recreation facilities exist on this site and the 500 kV facilities would have no impact on current recreation here. While visual impact on future recreation could occur if the ponds were developed for uses such as passive recreation, the ponds appear to have marginal value for such use because of their proximity to the highway and future indirect recreation impacts would be unlikely.

Jackson County Sports Park, nearby, is also traversed by the existing corridor. This park is used for very active recreation, including drag racing. The recreation experience here focusses on machinery and would not be degraded by the presence of additional transmission lines, nor would the new lines displace any recreation facilities or activities. Therefore, the 500 kV options would have no significant direct or indirect impacts on recreation in this park.

Options H, I, L, and M would avoid all impacts on recreation at Takelma Park.

DISPERSED RECREATION

The effects of the transmission alternatives and options on dispersed recreation would be limited to indirect visual effects on the quality of recreation experience, since no resources for this category of recreation would be displaced. The following discussion deals with effects on dispersed river recreation and trails. Effects on scenic highways are discussed in the next section on visual impacts, to avoid duplication.

Alternatives

The existing transmission corridor, the draft preferred alternative, and Alternatives 2, 3, and 4 would cross the proposed routes of two Oregon Recreation Trails: the High Divide Trail and the Rogue River Trail, near the north and south boundaries of Douglas County, respectively. The exact location of these crossings would be dependent on final design, both of the proposed transmission line and the trails themselves. The length of time for which future trail users would be exposed to transmission line views would be brief, and careful vegetation clearing and trail and tower siting would keep the impact of these crossings from becoming significant for any of the alternatives.

The quality of dispersed recreation on the North Umpqua River and on the Rogue River would receive moderate indirect impacts from the draft preferred alternative and Alternatives 2, 3, and 4. Moderate indirect impacts on Rogue River recreation would also result from the draft preferred alternative and Alternatives 2 and 3. Impacts from the new preferred alternative would be insignificant, due to the existing transmission crossing and less intensive recreational use along this portion of the Rogue River. These impacts to river recreation would consist of visual intrusion and removal of riparian vegetation. The existing corridor also crosses the West Fork of Evans Creek in several places. This creek is used for dispersed recreation, such as

swimming. The alternatives would reduce the indirect impact compared to the existing line because they would follow a realigned route in this area and would be somewhat less visible from the swimming areas than the line in the existing corridor.

Options

Impacts on dispersed recreation at the existing Rogue River crossing would not be significant for Options H, I (the new preferred alternative), L, and M. The current land use at this location is gravel extraction, which is planned to increase in extent. The existing 230 kV line is supported on steel towers at the river crossing and is similar in appearance to the proposed 500 kV line. Thus, the construction of single circuit or double circuit 500 kV transmission lines at this location would be unlikely to significantly increase the level of indirect impacts on recreation.

Option J, an underwater crossing of the Rogue River, would increase river bank disturbance during construction, but would greatly reduce the long-term visual intrusion of transmission facilities. Construction of the proposed transmission line with this option would not cause significant long-term direct or indirect impacts on dispersed recreation at either Rogue River crossing.

VISUAL RESOURCES

The visual character of the environments through which the project alternatives and options would pass is quite varied and thus the probable visual impacts are also varied. The context of these impacts in a specific area is determined both by the existing level of scenic quality and by the numbers and characteristics of the viewers exposed to the impacts. The BLM Visual Resource Management designations for the areas that would be crossed by the various route segments have been used to establish the importance of the visual context for these segments.

The intensity of visual impacts can be established by the degree of visual contrast introduced by the proposed transmission line. The major visual components of transmission facilities would be the structures or towers, the conductors and the right-of-way. The degree of contrast which these components introduce would be a function both of the existing visual setting and the viewpoints from which the transmission line would most often be seen.

Extensive field surveys and photography were used to establish viewpoints that are representative of the places from which the transmission route segments would actually be viewed. Many portions of the proposed line would be relatively remote and their visual impacts would likely be experienced only by small numbers of people travelling through or living in the immediate areas.

Photo-simulations have been prepared to illustrate the appearance and assess the visual contrast of the project alternatives and options in areas that are considered to be visually sensitive due to greater numbers of people or to land use for recreation or residential

purposes. Though actual tower locations are not yet known, the simulations illustrate the relative scale and character of the 500 kV line and the probable intensity of visual impact, based on the best available information on the location of the line. These simulations are included in Appendix C, with views of existing conditions included for direct comparison.

The probable visual impacts of the project alternatives and options are discussed below. These impacts are summarized in the Chapter 1 comparison tables. Certain areas appear subject to visual impacts on several distinct types of views or viewers; this is recognized in the impact tabulations included in Chapter 1. Levels of visual impacts are identified as high, moderate, or insignificant in these impact summary tables.

ALTERNATIVES

In the Twin Oaks-Spencer corridor (illustrated in Figures C-1 and C-2), BPA has an existing 230 kV line in the right-of-way, supported on steel lattice towers, as well as two wood-pole 115 kV lines. The visual complexity of the combination of structures and the straight edges of the corridor clearing contrast strongly with the surrounding wooded hills in the long views available from Dillard Road, Fox Hollow Road, and South Willamette Street. The double circuit 500 kV steel lattice structures to be added here would be much taller than the existing structures in this corridor (see Figure 1-5). The 500 kV structures would extend above the surrounding trees, making the line visible from streets and residences in the adjacent South Hills and Amazon neighborhoods between South Willamette Street and Dillard Road. The moderately high scenic quality of these wooded residential areas and the large number of residential viewers indicate the high sensitivity of the visual context along this segment. The 500 kV line would moderately increase the visual contrast between the corridor and the surrounding visual resources and cause a corresponding decrease in scenic quality. Although the intensity of these effects would be only moderate, the importance of the context indicates that the visual impacts would be highly significant, despite the presence of existing lines. Alternatives 2 and 3 would be identical to the draft preferred alternative at this location.

West of Cottage Grove, all the major transmission alternatives run along the perimeter of a new subdivision. Figures C-3 and C-4 present a view of the draft or new preferred alternative from the street in this subdivision, rather than from one of the residences. It is probable that the impact on residential views would be less adverse than illustrated, because these views are oriented downhill and away from the transmission right-of-way. However, some loss of screening vegetation would occur and the line would become more visible and dominant in many views within this subdivision. Nevertheless, careful tower siting and planning of vegetation clearing during final design should prevent incremental visual impacts from becoming significant at this location. Pacific has agreed to this and has also agreed to use nonreflective conductors and tower steel here to hold visual impacts to a low level. Alternatives 2 or 3 would be likely to increase the intensity of visual impacts in this area because they would increase clearing requirements on tower heights, respectively; their probable visual impacts are assessed as moderate.

The photo simulations at Elkhead (Figures C-5 and C-6) illustrate the visual impact of the draft preferred alternative on typical views where the line would cross forested but visually accessible terrain. Although the taller 500 kV towers would be clearly visible, the right-of-way clearing would not be increased. Considering both context and intensity, the incremental visual impact of the draft preferred alternative would not be significant in this and similar areas. This is also probable for Alternatives 3 and 4. Alternative 2, the parallel alternative, would increase the extent of right-of-way clearing and could have a moderate adverse impact in this area.

Two existing wood pole 230 kV lines and several lower voltage lines parallel the North Umpqua Highway closely for several miles, first on the west and then on the east. The numerous towers are clearly visible on the grassland hills, and the visual complexity which they create detracts from the scenic quality along this heavily travelled recreation route (Figures C-7 through C-10). The scenic quality of this route is good except for this location, and importance of the visual context of the corridor is high. The replacement of one of the existing lines with a 500 kV line would increase the adverse visual effects of the corridor. Both the parallel and double circuit alternatives would be more visually intrusive, because the former would retain all existing lines rather than replacing one of these, while the structures for the latter would be considerably taller than single circuit structures. Thus, the intensity of the visual impacts of Alternatives 2 and 3 on this scenic highway would be greater than the draft or new preferred alternative. Considering both context and intensity, as well as Pacific's agreement to use nonreflective conductors and tower steel on this segment, the adverse visual impacts of the draft or new preferred alternatives are assessed as moderate in this location and the impacts of Alternatives 2 and 3 are assessed as highly significant.

The draft or new preferred alternative would be visible from Interstate 5 at three locations: south of Cottage Grove (where the existing line crosses the highway), south of Canyonville, and at Azalea. The visual impact in the first location would not be significant because only a small length of the line would be visible through the trees on each side of the road. Because of the distance of the line from the highway at Azalea and the presence of screening vegetation and topography at Canyonville, the line would be a very minor feature in views in these areas and would not introduce significant visual contrast into views from Interstate 5. Alternative 2 would have similar visual impacts at all three locations. The taller double circuit structures of Alternative 3 would increase the probable visual impact at the Cottage Grove crossing to a moderate level.

The views of the existing transmission corridor and the draft or new preferred alternative at their crossing of the South Umpqua Valley (Figures C-11 and C-12) illustrate visual impacts typical of the immediate vicinity of the lines where they cross open farmland or grassland. The right-of-way is not visually evident and the additional contrast introduced by the 500 kV structures does not reach the level of significance. Although the contrast added by Alternatives 2 and 3

would be somewhat greater, only the visual impact of Alternative 3 is expected to be significant (at a moderate level), because its taller structures would increase the visually affected area.

In the Medford Basin, the draft preferred alternative would cause significant visual impacts at Takelma Park near the Rogue River crossing south of Shady Cove. Figures C-13 through C-16 illustrate existing visual conditions and the appearance of the transmission alternatives from Takelma Park. The base photograph is a typical view from the parking area. The line would also be visible from Rogue River Drive, at the left side of the view. Only a few trees border Rogue River Drive along the field through which the line would pass, just north of Takelma Park. The line would be clearly visible along the road for approximately one-quarter mile, but the duration of these views would be limited by the speed of automobile travel. Persons floating the river would also have a brief view of the line, largely limited to the overhead conductors. Eastward views of the line from the river would be blocked by mature cottonwoods.

In the simulated views, the structures and right-of-way clearing introduce a significant degree of visual contrast. With the use of nonreflective conductors and tower steel, as agreed by Pacific, the intensity of this contrast would be moderate for the draft preferred alternative and Alternative 2 (identical at this location) and high for the double circuit structures of Alternative 3. Tubular steel structures are also illustrated, and would reduce the contrast associated with the draft preferred alternative. Pacific agreed to plant trees and shrubs along the banks of the selected Rogue River crossing to help screen views of the line and reduce visual impacts (see Appendix A). At this crossing site, the most effective locations for such planting would be in Takelma Park. A detailed planting plan would be negotiated with the Jackson County Parks and Recreation Department to ensure that the planting would be visually effective and compatible with any future park development plans.

The BLM Visual Resource Management designation for this area is Class 2, reflecting its high existing scenic quality, the number of viewers, and the incidence of recreation activity. This designation indicates the high importance of the visual context in which the transmission facilities would be viewed. Several residences are located on the western hillside above the crossing; the views from these residences are parallel to the transmission alignment and the intensity of impact would be greater than in the public views form Takelma Park. Views down the transmission alignment would also reduce scenic quality from Rogue River Drive. These more general visual impacts at the Rogue River crossing are assessed as highly significant for the draft preferred alternatives, and Alternatives 2 and 3.

The point at which the draft preferred alternative would cross the Crater Lake highway, a designated scenic route, is illustrated from the northbound lane in Figures C-17 and C-18. The alignment would be inconspicuous because it crosses the highway as it dips into a small drainage. The northbound view would be brief and the southbound view

would be screened by roadside trees. The visual prominence of the transmisson line would also be reduced because Pacific has agreed to use nonreflective conductors and tower steel at this location. Thus, the intensity of the contrast introduced by the transmission line would be low. The visual context is moderate in importance here, although the river cannot be seen, because the roadside development which accompanies the highway throughout much of the Medford Basin thins out in this location. Few residential views would be affected, although a church is located approximately 1/8 mile south of the highway crossing and would be exposed to open views of the line. Considering both intensity and context, overall visual impact in this area would not be significantly adverse for the draft preferred alternative and Alternative 2, but would be moderate for Alternative 3. The same levels of impact are likely where these alternatives would cross Route 140 near Brownsboro.

Considering the entire route of the draft preferred alternative apart from the specific areas discussed above, the differences in visual impacts between the preferred and parallel alternatives are relatively slight because the route would have low visibility overall. Nonetheless, the parallel alternative would be somewhat more intrusive because it would require more right-of-way clearing. Views would also be more complex because no existing lines would be removed. A visual comparison of the draft preferred alternative with the double circuit alternative suggests that the former would cause less visual impact because it would employ smaller towers. However, if the comparison is made between the double circuit line and the possible ultimate development of two parallel single circuit 500 kV lines, the added impacts of taller double circuit towers would probably be more than offset by the reduction in right-of-way clearing, number of towers, and lower complexity of views toward the lines. Thus, if a second 500 kV line would be needed between Eugene and Medford, Alternative 3 would create less visual impacts than Alternative 2.

OPTIONS

Option A would involve removing the existing 230 kV line in the Lane-Twin Oaks segment of the BPA corridor and replacing it with the 500 kV line, rather than parallel construction. Because Option A would not increase the right-of-way clearing and would result in only one set of structures, it would cause less visual impact along this segment than the draft preferred alternative. However, the corridor siting is very inconspicuous in this segment and the incremental visual impacts of the 500 kV line would not reach a significant level in either case.

Options B and C would avoid all visual impacts assocated with the draft preferred alternative in South Eugene, at least for the near future. Option B would expose residences in the Spencer Creek area and around McBeth Road to transmission line views. However, these residences are fewer in number than the homes and apartments along the existing corridor, and the dense forest cover in this area would screen the line from most views. Therefore, the adverse visual impacts of Option B would not reach the level of significance. Option C, the new preferred

alternative segment from Spencer to Alvey, would completely avoid visual impacts in the residential areas between Lane and Spencer. However, the effectiveness of Options B and C as mitigating alternatives to the visual impacts of 500 kV development in the Twin Oaks-Spencer corridor would be entirely lost if it were found necessary to use that corridor for a future 500 kV link between Lake and Alvey substations.

Because of the open, exposed character of the landscape along the North Umpqua Highway it is not possible to eliminate the visibility of the 500 kV line along the existing right of way. Option D is designed to avoid increasing the visual impacts along the highway by routing the 500 kV line down a low-visibility side valley approximately one mile east of the highway and parallel to it. If the Alvey-Dixonville line were then removed, this option would achieve significant visual rehabilitation along the North Umpqua Highway because of the reduction in the visual complexity of the existing corridor. It would then open the possibility of future abandonment and total rehabilitation of this right-of-way.

Further south along the proposed route between Canyonville and Evans Creek, Options E, F, and G would follow the existing 230 kV alignment rather than the straighter, more direct draft preferred alternative, except in the case of modified Option G, which follows approximately 1.5 miles of the preferred alternative before following the existing 230 kV alignment.

Option E at Canyonville would cause greater visual impact than the corresponding portion of the draft preferred alternative because it would parallel I-5 closely for several miles and would be visible from this officially designated scenic highway. The 500 kV line would be more prominent than the existing line and would contrast with the steep, forested valley walls which constitute the highway viewshed, although the use of nonreflective conductors and tower steel, as agreed by Pacific, would help to reduce this contrast. The visual impact of Option E is assessed as highly significant, due to the importance of the visual context.

Option F, south of Cow Creek Valley, would be in a location with few paved roads or residences and, like the draft preferred alternative, would not cause significant visual impacts.

Option G and modified Option G, in the valley of the West Fork of Evans Creek, would differ little in visual effects from the draft preferred alternative. In this location, careful tower siting near the road and creek could prevent visual impacts from becoming significant, whichever alignment is chosen.

Option H would follow the Lyman Mountain ridge above the populated portion of Sams Valley to meet an existing corridor to the south. From there it would turn east to Lower Table Rock, where it would meet Line 54 and follow the existing corridor to the Meridian Substation. This option would avoid expansion of the Line 54 corridor through Sams

Valley. It would be briefly visible where it would cross Sams Valley Road at the southwest end of the valley and would be visible, but not prominent, across the northern base of Lower Table Rock. If sited on the crest of the Lyman Mountain ridge, Option H would also be very visible from Sams Valley and both Table Rocks. By siting the line to the west of the crest, it should be possible to avoid silhouetting it against the sky except where it crosses the ridge at Lyman Mountain. The exact location of this alignment cannot be determined until geologic investigations have been completed by Pacific at the design stage, although Ferris (1982) has indicated that secure tower sites could be found off the crest of the hill. This portion of Option H would then have low visual impact, while from Lower Table Rock on, Option H would have the same effects as Option I.

Option I, the new preferred alternative routing in the Medford Basin, would follow the existing corridor from Ramsey Canyon, through Sams Valley, across the Rogue River, through White City, and on to Meridian. The visual effects of replacing Line 54 with a 500 kV line through the Sams Valley area were identified as a concern during the scoping meetings for the study. Option I would hold the intensity of these impacts to a moderate level by the use of tubular steel structures and nonreflective conductors for the 500 kV line, illustrated in Figures C-19 and C-20. The simplicity and apparent scale of these structures make them more visually appropriate to residential areas than steel lattice structures. Additional right-of-way would be required in Sams Valley and tall trees would need to be cleared, but low-growing vegetation such as shrubs, low-growing oaks, and fruit trees could remain, subject to a case-by-case analysis during final design. The existing route runs on the half-section line through Sams Valley and is generally screened from road views by vegetation. The impact on residential views depends on the orientation of each residence, but most views toward the line appear to be at least partially screened. The visual contrast which would be introduced by the 500 kV line appears moderate to low, but the visual impact has been assessed as significant at the moderate level because of the existing quality and sensitivity of the visual context.

South of Sams Valley, Option I would be located on the north and east slopes of Lower Table Rock, where it would cause a moderate adverse impact on views from Table Rock Road and Sams Valley Road. The existing Rogue crossing is inconspicuous due to lack of public access and dense riparian vegetation. Public views of the crossing are limited to the brief views available from the river itself. It is probable that the visual contrast of new 500 kV facilities along the river would not add significantly to the adverse visual effects of the existing crossing and adjacent gravel extraction operation. Similarly, the visual contrast introduced by 500 kV development in the existing corridor would be minimal from the river to Crater Lake Highway because of extensive heavy industry next to the line. Existing commerical strip development at the Crater Lake Highway would also keep the incremental visual impact at the highway crossing from reaching the level of significance.

From Crater Lake Highway east, the existing corridor parallels Route 140. There are large numbers of residential viewers and heavy traffic in this area. However, scenic quality is low here due to the flat terrain, absence of trees, extensive industrial and commercial development, and the existing transmission facilities. The 500 kV line, supported on tubular steel towers in this segment, would not add a significant increment of contrast and the overall visual impact of Option I (the new preferred alternative) is assessed as low in this area. The appearances of Options H, I, L, and M are illustrated in Figures C-22 through C-24 in Appendix C.

At the White City Rifle Range (now Jackson County Sports Park), the existing corridor turns south for several miles to Meridian Tap east of Coker Butte. Options H, I, L and M would follow the existing corridor to that point. There they would turn east and parallel the line on into Meridian Substation. The existing line is visible from the Medford Basin as it crosses the ridge north of Roxy Ann Peak. New transmission lines would require taller structures, but little or no right-of-way clearing on this grassland hillside. The incremental visual impact of these lines would not reach significance.

Option J, an underwater crossing of the Rogue River, could be implemented either for the alternatives along the draft preferred route or for the options along the existing corridor. At the crossing site just north of Takelma Park, Option J would reduce long-term visual impacts to an insignificant level by removing overhead towers, although a cleared right-of-way would still be visible. The terminals necessary for an underground crossing would resemble small substations, but would be sited well back from the river and out of view; tentatively, the eastern terminal could be located east of Crater Lake Highway and the western terminal could be located west of Rogue River Drive. At the crossing site on the existing corridor, Option J would also reduce visual impacts, but these impacts would be low in any case.

Options K, L and M are the Medford Basin ultimate development options that correspond to the alignments of the draft preferred alternative, Option H, and Option I, respectively. Initially, Option K would involve acquisition of land for two 500 kV single circuit lines but only one would be constructed. The visual impact of Option K would, therefore, be the same as the draft preferred alternative until such time as a second line would be constructed.

Options L and M would entail construction of a 500kV double circuit line in a "stacked" or "double delta" configuration on existing routes through Sams Valley and the Medford Basin (see Figures 1-20, 1-21, 1-22, and C-21). This would significantly increase the height and the visibility of the structures in comparison to Options H and I. The adverse visual impacts of both options would be moderately significant around Lower Table Rock, while Option M would cause highly significant visual impacts in Sams Valley. However, direct comparisons of the visual impacts of Options L and M with those of Options H and I do not consider that the ultimate development options meet projected needs and requirements for a longer planning period than Options H and I. For this reason they are not strictly comparable, as discussed above for Option K.

LAND USE

A transmission line could impose several types of impacts on land use. First, the location of the line could require the removal of existing structures or could preclude the construction of new structures on properties the line would cross. Second, transmission lines could interfere with productive use of the right-of-way. Examples include forestry and industrial activities such as log yarding. However, many site uses that would not involve structures can take place within the right-of-way. Examples include parking areas, gardens, and orchards. A third type of land use impact is indirect, such as reduction of visual amenity in residential areas. Many of the potential land use impacts of the project alternatives and options that are discussed below fall into this last category.

The context of specific land use impacts can be determined by the economic or social importance of the land use of the community, the level of investment in facilities for the use or the difficulty of relocating the use, and the number of people involved. The intensity of the impact can be assessed by the number or extent of buildings removed (if any), the degree of interference with productive use of specific sites, and the level of indirect effects.

The land use impacts of the project alternatives and options are discussed below. These impacts are summarized in the Chapter 1 comparison tables. Certain areas may be subject to several distinct types of land use impact; this is recognized in the impact tabulations included in Chapter 1.

COMMERCE, INDUSTRY AND TRANSPORTATION

The route of the draft preferred alternative and Alternatives 2 and 3 would not cross any areas used for commercial or industrial purposes and would have no effects on these categories of land use. This route would cross many ground transportation routes including railroads and highways; well-established design criteria, which include minimum conductor clearance specifications, will ensure that those crossings do not interfere with surface transportation. Visual effects would be associated with transportation route crossings; these have been discussed in the previous section on visual resources. The draft preferred route would also pass within several miles of two small general aviation airports in the Medford Basin, but is far enough away from both that it would have no significant effect on air navigation at either airport.

Of the options, those located along the existig corridor in the Medford Basin could involve some impacts on commercial, industrial, or transportation land use.

An aggregate plant is located at the existing Rogue River crossing and has received planning approval for expansion to the north side of the river in the immediate vicinity of the existing transmission easement. Pacific did not comment on the planning application because it believed the operation would not affect the stability of its existing lines, although it also recognized the possibility of locating additional lines at this location (Ferris 1981a).

Options H, I (the new preferred alternative), L and M would all require additional right-of-way across the aggregate mining area. However, the impact on aggregate extraction would be minimal on several counts. No permanent buildings or structures exist or would be built that would have to be removed from the right-of-way. The planned method of operation (using scrapers for excavation rather than a dragline) would be compatible with the transmission easement and almost the entire right-of-way could be mined. The exception would be the tower sites themselves and only one or two towers would be located on the aggregate company's land. While there is a public interest in assuring an adequate supply of aggregate at an economic price, the amount of gravel foregone would have an insignificant effect on this interest.

Option J, the underwater crossing, could also be designed to have a minimal effect on aggregate extraction. For instance, the line could be excavated and placed below the maximum depth of gravel extraction, and the aggregate removed in the process could be stockpiled by Pacific at the owner's direction.

Farther east, at the junction of the Crater Lake Highway and Route 140, there are a number of commercial and light industrial structures near the existing corridor. The corridor also traverses a planned commercial development on the west side of the Crater Lake Highway.

Options H and I would require no additional right-of-way here, they would have no effect on existing commercial and industrial uses. It is likely that the new preferred alternative (Option I) or Option H would also have no adverse effect on the planned commercial development, since transmission lines can easily be incorporated into the extensive parking lots such developments usually provide.

Options L and M would require additional right-of-way and would probably be located on new right-of-way south of Route 140, as illustrated in Figure C-24 in Appendix C. These options could make some modification of the plans for the commercial development necessary. More significantly, these options could restrict the use of the north portion of the industrial properties along Route 140, or even require the removal of one or more industrial structures. While this possibility cannot be resolved until final design takes place, it warrants a rating of moderate land use impact for these options.

In the White City area, Options H and I (the new preferred alternative) would pass within several miles of the Medford Airport. The towers for the 500 kV lie would be higher than the existing structures in the established corridor. Nevertheless, they would not be close enough to the airport to constitute a flight obstruction or to require FAA notification. Options L and M would involve taller structures. However, if airport clearances for the Medford Airport prove to be a problem, these structures could be spaced close together and their bases shortened to obtain required air navigation clearances.

Options H and I also would pass a small private airstrip located northwest of the Table Rock Switching Station. This strip is oriented north-south, parallel to Line 54. Option I would replace Line 54 and therefore would not interfere with current use of the strip. Option H runs east-west in this area, but would not constitute any more of an obstruction than the existing line it would parallel and the distribution line along Sams Valley Road, just south of the airstrip.

RESIDENCES

Numbers of residential dwelling units within 1000 feet of the proposed line or options were estimated from air photo interpretation and field surveys and are listed in Tables 1-4, 1-5, and 1-6. These counts give a general indication of the degree of development along the alternatives and options and of the possible level of public concern over residential land use impacts. However, only a very small proportion of these residences would experience direct physical impacts or visual impacts from the proposed line, most of them being screened by vegetation or topography.

The concentration of residences in the South Eugene area includes approximately 25 percent of the total number of houses and all of the apartment units along the draft preferred alternative. The majority of these are concentrated within the Eugene Urban Growth Boundary between Twin Oaks and Spencer Switching Station. Because of the concentration of residences, this area of the line is one of the most sensitive in terms of land use. In addition to the existing residences in this area, there are several planned unit developments and other projects planned or under construction within 1000 feet of the line.

Other areas with concentrations of residences include a subdivision at Cottage Grove, Lynx Hollow, Fairoaks, the area south of Dixonville Substation, and Sams Valley and White City along the existing corridor in the Medford Basin. In the Eugene and Medford areas there are significant differences in the numbers of residences that would be affected by an option, in comparison to the corresponding section of the draft preferred alternative. Option B would avoid the concentration of house and apartments in South Eugene by following a route to the south of the Urban Growth Boundary through an area that is still relatively sparsely populated. Option C, part of the new preferred alternative, would entirely avoid the residential areas near Eugene. A significant difference between routes also applies to the Medford Basin, where the draft preferred alternative would avoid existing population concentrations along Options H, I (the new preferred alternative), L, and M by skirting the Basin to the north and east.

Direct physical impacts on residences appear limited to one location for the alternatives. For all of these, it appears that it would be necessary to remove a single house within the existing right-of-way just south of the North Umpqua River. While serious to the residents involved, the impact to the overall housing stock of Douglas County would not be significant.

Additional direct impacts on residences are limited to Options L and M. These represent the ultimate development options for the Medford Basin which parallel all or part of the existing corridor. South of Jackson County Sports Park, near the beginning of the Meridian Tap, the two options are identical and would require the acquisition of 262.5 feet of additional right-of-way on the west side of the existing corridor. Three residences, plus at least two houses under construction, are located within this strip of land. While these residences would not need to be removed for the construction of the proposed line, their purchase would be necessary if Options L or M were adopted, in order to reserve space for a second Eugene-Medford 500 kV line. Given the growth pressures in the Medford Basin and the importance that the Jackson County plan gives to maintaining the housing stock, this is assessed as a moderate impact on residential land use. Despite this assessment of general impact on housing, it is recognized that the impact on the persons involved would be high.

A second type of impact on residential land use would be caused by the safety restrictions imposed by transmission easements. Structures could not be built within the easement, so the location of a right-of-way across a lot would restrict the location of a future residence. In areas where the average lot size is less than an acre (approximately 200 feet square), a 175 foot right-of-way split evenly between abutting properties would greatly constrain the future use of the site for residential purposes.

However, the areas where additional right-of-way would be required are generally planned and zoned for minimum residential lot sizes of 2-1/2 to 10 acres. Assuming a square configuration, such lots range in approximate size from 330 feet to 660 feet on a side. Although a transmission right-of-way could interfere with the development of lots that are already platted, and even require replatting in some instances, the restrictions or impacts on residential land use would be much less in areas exhibiting this density than in more urban areas and would generally cause no reduction in the amount of land available for housing development. These restrictions on land use include vegetation management requirements, limits on the placement of outbuildings, and the presence of a tower on every fourth or fifth lot. Site-specific problems due to these impacts cannot be assessed until a route has been selected and detailed right-of-way surveys are carried out.

A third and more widespread type of residential land use impact that would be expected is a decrease in visual amenity for areas exposed to views of the proposed transmission line. Overall visual impacts, considering both context and intensity, have been assessed for the areas along the alternatives and options where concentrations of residences occur. From this perspective, the proposed transmission line would be unobtrusive at most locations. However, in the South Eugene area, the draft preferred, parallel, and double circuit alternatives (all identical in the Twin Oaks-Spencer segment) are assessed as likely to have highly significant indirect (visual) impacts on residential land use. Alternative 2, because of its wider

right-of-way clearing and retention of existing structures, appears likely to cause a moderate degree of indirect (visual) impact at Lynx Hollow, West Cottage Grove and Elkhead. Alternative 3, because of its taller and more prominent double circuit structures, is assessed as causing moderate indirect impacts at Lynx Hollow, West Cottage Grove, and Fairoaks. In the Medford Basin, the draft preferred alternative and Alternatives 2 and 3 traverse terrain that is sparsely settled at present, but which is undergoing conversion to rural residential use. Because of the restrictions on property use in subdivisions along this route due to the opening of a new corridor, in combination with the indirect impacts on residential amenity, overall land use impacts in the Medford Basin are assessed as significant at the moderate level for these alternatives.

Of the options, Option B south of Eugene would have moderate impacts on residential land use for the same reasons as the draft preferred alternative in the Medford Basin. In the Sams Valley area, Option I (the new preferred alternative) would cause moderate indirect impacts on residential amenity while Option M would cause highly significant indirect impacts. Options L and M would be likely to cause a moderate degree of incremental visual impact on residences at White City, because they would bracket both sides of Route 140 with transmission lines (see Figure C-24).

These overall assessments are necessarily generalized; indirect amenity impacts at individual residences may be greater or less, depending on specific circumstances of view orientation and the presence of vegetation that would screen views of the lines. In many cases, visual impacts at individual residences in rural areas would be limited by careful tower siting and vegetation clearing. Figures 3-1 and 3-2 illustrate locations along the existing corridor where careful preservation or pruning of trees has preserved a visual buffer between the lines and adjacent houses. Clearing and vegetation management practices like these would be negotiated by Pacific on a case-by-case basis, as long as the integrity of the line would not be jeopardized.

AGRICULTURE

Generic impacts of transmission lines on agriculture include removal of land from production, soil compaction and other surface disturbance, and interference with farming practices. Land occupied by transmission towers and the surface disturbance from construction activity constitute unavoidable impacts, although the latter effects are temporary and both types of impacts are mitigated through compensation or restoration measures. In many respects the greatest long-term impacts are interference with farming activities, including cultivation, planting, irrigation, weed control, chemical application, and harvesting. The need to work around transmission towers creates an efficiency loss through increased operating time. Overlapping operating patterns around towers can also lead to productivity losses through excess application of seed, fertilizer or pesticides and from overworking the soil. Transmission lines create difficulties in the

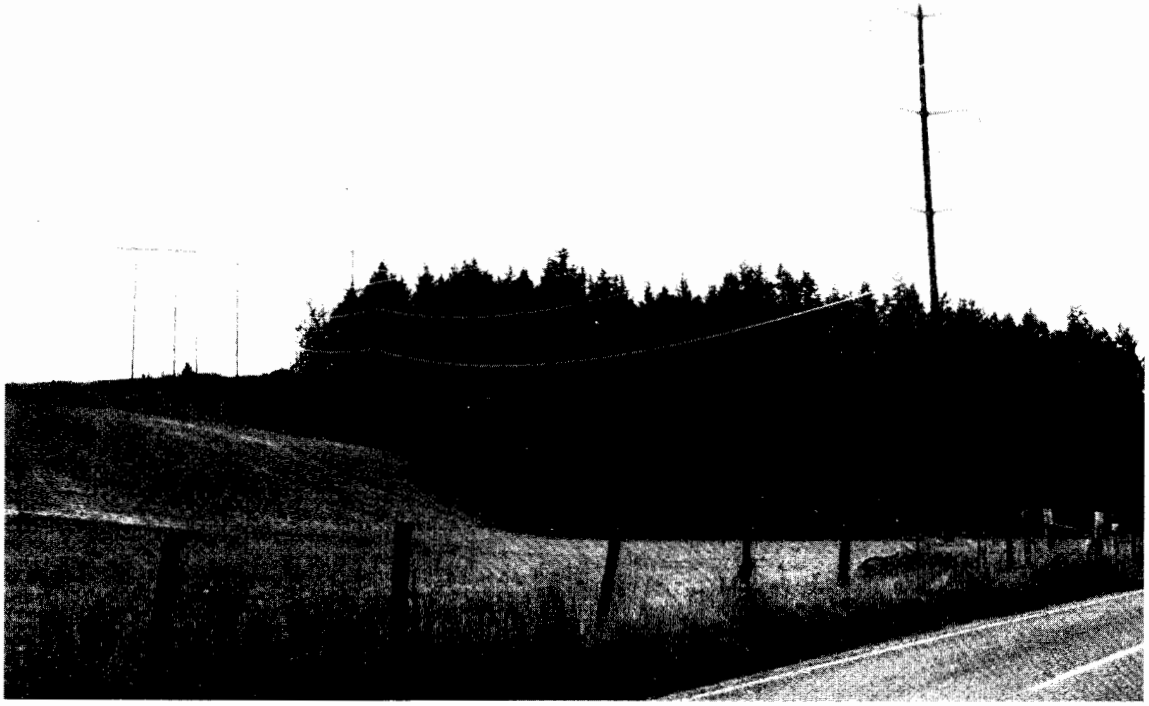


FIGURE 3-1: MAINTENANCE OF VISUAL BUFFER FOR ADJACENT RESIDENCE (HIDDEN IN TREES) BY MINIMUM CLEARING AND SELECTIVE PRUNING (EXISTING CORRIDOR, LOOKING SOUTH).

FIGURE 3-2: MAINTENANCE OF VISUAL BUFFER FOR ADJACENT RESIDENCES AND RECREATIONAL USE OF RIVER BY RETENTION OF SHRUBS AND LOW TREES (EXISTING CORRIDOR, NORTH UMPQUA RIVER, LOOKING SOUTH).

aerial application of pesticides and other chemicals due to safety hazards, while disturbance associated with construction can lead to the introduction of undesirable weeds. Finally, transmission lines can be incompatible with irrigated agriculture, particularly where moving sprinkler irrigation systems are used. In some previous cases, the position of towers has interfered with the irrigation pattern to the extent that it has been necessary to adjust movement patterns, convert systems, or even abandon irrigation of some areas between towers (USDI BPA 1977b).

Most long-term effects stem from the number of towers, their placement, and the type of agricultural activities present. Some agricultural parcels can be spanned or avoided, as described previously, while placement of towers along fencerows, property lines, section lines, or other field division lines can substantially reduce the degree of interference with farming practices. Similarly, multiple lines across farmlands will have less impact if tower sites are matched, rather than staggered.

For those alternatives (preferred and double circuit) involving no change in the number of transmission lines present over most of the route, the result would be the removal of approximately three wood pole structures for every two steel towers built in the replacement sections. The advantages to farmers of having fewer structures overall under these configurations would be partially offset in areas where there are existing parallel wood pole lines, but the net result in these areas would probably be little or no worse than current conditions. Conversely, the parallel alternative would result in an increase in the total number of structures in all cases, and would also introduce the problem of staggered tower sites along a large portion of the route.

Productivity

The agricultural soils areas affected by the three initial construction alternatives and options are summarized in Table 3-4, based upon the process and conditions described in Chapter 2 and the Technical Investigations Report. These figures represent an overstated or worst-case scenario, because some of the land classified as agricultural soil is actually being used for forestry, residential use, and other purposes, although acreages in this condition cannot be precisely determined. The vegetation studies identified 14.8 miles of cropland and 16.5 miles of grazing land along the entire draft preferred alternative route. This compares to the 51 miles of agricultural soils shown in Table 3-4. In addition, some of the agricultural land along the route can be avoided through various design adjustments, such as siting towers so that a particular parcel can be spanned.

TABLE 3-4

AFFECTED AGRICULTURAL SOILS AREAS

	Draft Preferred Alternative	Alternative 2 Parallel	Alternative 3 Double Circuit	**Alternative 4 New Preferred Alternative**
Prime Agricultural Soils				
Route mileage	10.0	10.0	10.0	**10.2**
Additional right-of-way acreage	30.3	170.2	30.3	**6.7**
Temporarily disturbed acreage	5.2	6.5	5.2	**2.8**
Tower site acreage*	1.1	2.0	1.1	**1.1**
All Agricultural Soils				
Route mileage	51.0	51.0	51.0	**51.2**
Additional right-of-way acreage	234.4	847.7	234.4	**135.9**
Temporarily disturbed acreage	26.3	32.9	26.3	**13.7**
Tower site acreage*	5.9	10.1	5.9	**5.7**

*Based on application of standard design factor of 4.3 towers per mile, as if agricultural route mileage were continuous.

Impacts shown in Table 3-4 include the additional right-of-way required, the area temporarily disturbed, and tower site acreage in prime and all (including prime) agricultural soils. These quantities were developed using the requirements set forth in Table 1-2 and a standard factor of 4.3 towers per mile, with no regard for the size of a particular tract of agricultural land and the possibility of avoiding it. The minor acreages involved for any of the alternatives (a maximum of 10 acres of agricultural soils occupied by tower bases) indicate that the effects of the proposed project on agricultural land uses might be moderately significant for individual farmers, but would be insignificant in any other context.

Impacts of the options on areas of agricultural soils are summarized in Table 3-5. In the interest of brevity, this table presents the net change for options A-G and J as compared to the section of the draft preferred alternative each would replace. For the Medford Basin options (H, I, K, L and M) the anticipated effects are presented directly in acres. None of the options would represent more than a marginal change in the area of agricultural soils affected by the draft preferred alternative, indicating that the agricultural productivity effects of the options would also be insignificant.

Prime Farmlands

It is a Federal policy to avoid impacts to farmlands designated as prime and unique (definitions are based on soil characteristics, land use factors, and potential productivity) by the U.S. Department of Agriculture (42 U.S.C. 4321; 42 F.R. 61072, December 1, 1977). The proposed transmission line would adversely affect prime farmlands in some locations along the route. As shown in Table 3-4, the proposed route for the four construction alternatives crosses approximately 10 miles of lands designated as prime agricultural soils or prime farmlands. Without allowance for spanning or avoiding these areas, it is estimated that a maximum of about five acres of prime farmland would be disturbed by development of the draft preferred or double-circuit alternative, and 1.1 acre would be permanently removed from production. Corresponding estimates for the parallel alternative were 6.5 acres and 2.0 acres, while figures for the new preferred alternative would be 2.8 acres and 1.1 acre, respectively. Tower site acreage is less for the draft preferred alternative because some sites currently occupied by wood structures could be returned to production.

These figures should be viewed as maximum possible prime farmlands effects based on preliminary estimates. After detailed study of large-scale maps, Pacific engineers determined that most of the prime farmland areas could be avoided, and that only six towers would be required on prime farmlands along the entire route for any alternative

TABLE 3-5

AFFECTED AGRICULTURAL SOILS AREAS, OPTIONS vs. DRAFT PREFERRED ALTERNATIVE

Option	Route Mileage	Additional[1] Right-of-Way (ac)	Temporary Disturbance (ac)	Tower Sites[2] (ac)
Options A-G, J (net change from **draft** preferred alternative)				
Option A, Lane-Twin Oaks Replacement	+0	−50.2	−.5	−.7
Option B, Lane-Camas Swale New Corridor	+0.6	+61.7	+8.2	+.4
Option C, Alvey-Spencer[3]	−3.9	−42.5	−1.5	−.6
Option D, North Highway Bypass	−.2	+32.8	+4.5	+.2
Option E, Existing Canyonville Corridor	0	0	0	0
Option F, Existing Green Mt. Corridor	0	0	0	0
Option G. Existing W. Fork Evans Creek-Ramsey Canyon Corridor[4]	−.2	−9.1	−1.5	0
Option J, Rogue River Underwater Crossings				
Draft Preferred Alternative	0	−11.3	+.35	+2.0[5]
Existing Corridor (Compared to Option H or I)	0	+5.4	+.29	+2.0[5]
Draft Preferred Alternative,				
Option K	5.0	106.0	13.3	1.0
Option H, L	7.3	61.2	61.2	4.5
Option I[3], M	9.1	50.0	3.2	1.4

[1] Right-of-way acquired for ultimate development options would be roughly double these figures, but only portion shown in table would be affected immediately.

[2] Represents conservative estimate of actual tower base plus surrounding area which could not be cropped.

[3] **Part of new preferred alternative.**

[4] **Modified Option G values same as Option G since only forest affected.**

[5] **Reflects area of terminal stations versus tower sites.**

if avoidance of prime farmlands were the sole tower siting objective (Ferris 1981b, 1982). These locations include one tower near Silk Creek west of Cottage Grove, two near the South Umpqua River, two along the east side of the Rogue River, and one in the valley of Little Butte Creek. These six towers would occupy a total of between 0.1 and 0.2 acre. Five of the six tower sites (all but Silk Creek) correspond to floodplain tower sites, which are discussed later. The Silk Creek, South Umpqua and Little Butte Creek sites are currently occupied by improved pasture or hay land, while the two Rogue River sites are currently occupied by riparian woodland. Compared to the total area of prime farmlands in the general vicinity of the proposed route, or in the local areas surrounding the above sites, the effects of any of the alternatives on prime farmlands would be insignificant.

Selection of Option B for the Eugene area would increase the effects on prime farmland, as BPA engineers estimate that 8 to 10 towers would be required on prime farmlands in this new corridor segment (Beraud 1982a). These structures would occupy nearly 0.2 acre, mostly in the Spencer Creek and Camas Swale Creek valleys. Option C, the new preferred alternative route for the Eugene area, would not affect any prime farmlands. In the Medford area the new preferred alternative (Option I) and the other options using the existing corridor (Options H, L and M) would have less effect on prime farmlands, as these options would require only one tower on prime land at the Rogue River crossing and four along the entire route. Terminal structures for the underground option would not be located on prime farmland, although disturbance along the 50-foot wide cable corridor would affect 2.4 acres on the draft preferred alternative route and 1.8 acres at the existing Rogue River crossing for one growing season, unless cable repairs required subsequent disturbance. The prime farmland effects of the options, either alone or in conjunction with the alternatives, would be insignificant.

There do not appear to be any practical alternatives to locating some towers on prime farmlands under any combination of alternatives and options under assessment in this EIS. The prime farmland areas which would require towers are located in the bottoms of stream valleys which are essentially perpendicular to the route and are too wide to be spanned. Impacts to prime farmlands could be minimized by following the draft or new preferred alternative in the Eugene area and the new preferred alternative along the existing corridor in the Medford area.

FOREST PRODUCTIVITY

Potential long-term impacts to the productivity of commercial forest land resulting from the proposed transmission line and its alternatives are summarized in this section. The figures provided represent a worst-case scenario of lost timber production for several reasons. First, field and aerial photo investigations indicated much of the land along the route which has been classified as commercial forest land has been committed to other uses and is not managed for timber production, although the proportion of forest land in this condition cannot be

easily quantified. This is particularly the case in the northern portion of the route, essentially from Lane Substation to near Cottage Grove, where forest land has been affected by urbanization, subdivision and recreational development. In addition, the calculation of lost timber acreage and volume assumes clearing of the entire right-of-way, which would not be the case. In new corridor sections, for example, it is assumed that on average 125 feet of the 175-foot right-of-way would be cleared; trees left standing on the corridor might not be allowed to reach full economic maturity, but the productive capability of this land will not be entirely foregone immediately upon construction.

The forest impacts resulting from clearing the right-of-way for the preferred route would be partially offset by allowing portions of the existing 100-foot wide Line 54 corridor to revert to former vegetative conditions. If the three realignment sections south of Dixonville were developed for any of the alternatives (i.e., if Options E, F and G were not selected), Line 54 would be removed in the retired Canyonville, Green Mountain and West Fork Evans Creek corridor sections and previously forested areas within these sections would be restored to forest cover as described in Chapter 1. The restored acreage and the wood production volume which it would support must therefore be subtracted from the clearing impacts in order to determine the net forest productivity effects of the alternatives.

Alternatives

The draft preferred alternative would result in the clearing of 83.2 miles and up to 647 acres of classified commercial forest land. The annual volume which this area is capable of producing is about 56,419 cubic feet, or approximately 293.4 thousand board feet (MBF) at a conservative conversion ratio of 5.2 board feet per cubic foot, the standard Oregon Department of Forestry conversion factor for western Oregon (Joerger 1981). (Stumpage values, wood products employment and other economic factors related to lost timber production are described in the economic section of this chapter.) Class 4 and 5 timber lands, primarily in the Dixonville-Ramsey Canyon portion of the line, account for about 70 percent of the total forest route mileage (58.4 miles) and 87 percent of the timber volume (48,930 cubic feet per year). Class 3 timber lands in the Lane-Spencer and Dixonville-Ramsey Canyon segments account for 4.8 miles and 7,488 cubic feet per year of lost production.

Allowing the Canyonville, Green Mountain and West Fork Evans Creek existing corridor sections to revert to natural vegetation would result in the restoration of forest cover along 15.5 miles of classified commercial forest land. Since the existing corridor is 100 feet wide, this reverted corridor represents an area of approximately 188 acres of forest land, including 16 acres of Class 3 land and 172 acres of Class 4 and 5 land. The production potential of the reverted acreage is estimated at 16,583 cubic feet per year, or 86.2 MBF per year. Subtracting these values from the clearing figures stated previously yields net forest productivity impacts for the draft preferred and

double circuit alternatives of 459 acres of commercial forest and lost annual production of 39,836 cubic feet or 207.2 MBF. These figures are presented in Table 3-6, along with corresponding data for the parallel and new preferred alternatives.

TABLE 3-6

NET FOREST PRODUCTIVITY IMPACTS

Impact	Draft Preferred Alternative	Alternative 2 Parallel	Alternative 3 Double Circuit	**New Preferred Alternative Alternative 4**
Route Mileage	83.2	83.2	83.2	**77.6**
Cleared Acreage	459.1	1,237.8	459.1	**362.7**
Cubic Feet/Acre/Year, Ave	86.8	100.6	86.8	**90.2**
Cubic Feet/Year Lost	39,836	124,536	39,836	**32,714**
Thousand Board Feet (MBF)/Year Lost	207.2	647.6	207.2	**170.2**

Compared to the net effect of the draft preferred alternative, the parallel alternative would require more than double the cleared acreage and would increase the annual volume foregone by 213 percent (647.6 MBF vs 207.2 MBF). Aside from the wider right-of-way needed for Alternative 2, a major reason for this difference results from right-of-way clearing in the Camas Swale-Dixonville section, where the route crosses 18.2 miles of Class 3 lands; the draft preferred alternative does not require any additional right-of-way in this section. The new preferred alternative would result in the lowest forest productivity effects, as it would require clearing approximately 363 acres of comercial forest and an annual loss of 170 MBF of timber. Despite the large relative difference in lost production between the alternatives, the absolute level of the forest productivity effects for all alternatives would be insignificant compared to the levels of wood production and timber harvest in the surrounding area.

Options

The forest productivity impact levels of the options differ from the draft preferred alternative, but these changes are minor as indicated by the figures in Table 3-7. If adopted, none of these options would change the significance level of the forest impacts of the project. The greatest difference from the impacts of the draft preferred alternative would result from selection of Option B, which would require a new corridor from Twin Oaks to Camas Swale. This new corridor would cross 3.1 miles of Class 3 land, resulting in an

additional .3 miles and 70.5 acres of forest clearing. The additional volume of 9,514 cubic feet lost annually through Option B represents about 24 percent of the total lost production for the draft preferred alternative. Options H and L in the Medford Basin would also involve greater forestry impacts than the draft preferred alternative, although these options represent minor volume increases of 1,462 and 3,120 cubic feet, respectively. Options K, L, and M, the ultimate development possibilities for the Medford Basin, have been treated similarly with the draft preferred alternative and Options H and I because the additional right-of-way acquired would not be cleared for 15 or more years. Clearing impacts roughly equal to those shown in Table 3-7 would occur at that time. The estimated effects associated with each of the Medford Basin options can be calculated from Table 3-7, noting that the draft preferred alternative would result in 135.1 cleared acres and 8,782 cubic feet per year of lost production (45.7 MBF reduction per year).

Selection of Options E, F or G would also lead to somewhat greater forest productivity impacts for any of the alternatives, due to the effect of restoring the existing corridor on the net impacts of the alternatives. For example, the acreage and volume lost by widening the existing Canyonville corridor by 75 feet for Option E would be 31.9 acres and 2,712 cubic feet per year. These figures are 14.8 acres and 1,258 cubic feet, respectively, greater than the combined effect of clearing a wider, but shorter new corridor while restoring the existing corridor. Option F would involve a net increase of 2,261 cubic feet of lost annual production, as shown in Table 3-7, while selection of Option G would increase the lost production by 1,709 cubic feet per year. The increase in lost production from modified Option G would be 1,199 cubic feet per year. The cumulative volume increase which would result from following the existing corridor entirely in all three locations would be 5,228 cubic feet per year, a figure equivalent to about 13 percent of the total volume lost through the draft preferred alternative.

Options A, C, I and M represent somewhat lower levels of forestry impacts than the draft preferred alternative, while selection of Option J would not have any net effect on forest land. The reductions in lost timber volume possible through each of these routing options are relatively small, ranging from about 2,700 to 5,600 cubic feet per year. The volume savings from following the new preferred alternative along the existing corridor in the Medford Basin would represent about 14 percent of the total for the draft preferred alternative. Combining the effects of Options C, I, and modified Option G, the new preferred alternative would result in a volume savings of 7,122 cubic feet per year compared to the draft preferred alternative, a difference of 18 percent.

FLOODPLAINS

The proposed transmission route crosses portions of fourteen 100-year floodplains between Lane and Meridian Substations, as stated in Chapter 2. These floodplain crossings are unavoidable because most of the streams along the route generally flow to the east or west, or perpendicular to the transmission route. Most of these floodplains are

TABLE 3-7

FOREST PRODUCTIVITY IMPACTS, OPTIONS vs. DRAFT PREFERRED ALTERNATIVE

Net Change From **Draft** Preferred Alternative

Option	Route Mileage	Cleared Acreage	Cubic Ft/Yr	MBF/Yr
Option A, Lane-Twin Oaks Replacement	−1.9	−28.9	−3,362	−17.5
Option B, Lane-Camas-Swale New Corridor	+.3	+70.5	+9,514	+49.5
Option C, Alvey-Spencer	−3.7	−24.3	−2,718	−14.1
Option D, North Umpqua Highway Bypass	+.9	+17.2	+1,462	+7.6
Option E, Existing Canyonville Corridor	+.9	+14.8	+1,258	+6.5
Option F, Existing Green Mountain Corridor	+1.5	+20.1	+2,261	+11.7
Option G, Existing W. Fork Evans Creek-Ramsey Canyon Corridor	+1.2	+20.1	+1,709	+8.9
Modified Option G	**+1.2**	**+14.1**	**+1,199**	**+6.2**
Options H and L, Medford Basin West Route	+2.4	+48.0	+3,120	+16.2
Options I and M, Medford Basin Existing	−3.1	−88.2	−5,603	−29.1
Option J, Rogue River Underwater Crossings	0	0	0	0

relatively narrow and can be crossed by single spans, with no towers actually located within the floodplain. Floodplain tower sites would only be necessary at the South Umpqua and Rogue Rivers, and at Little Butte Creek if the draft preferred alternative in the Medford area is developed. In compliance with Executive Order 11988 on floodplain management and subsequent U.S. Department of Energy regulations (10 CFR 1022), these floodplain impacts are described in more detail below.

Draft Preferred Alternative

Based upon available engineering information, the draft preferred alternative would require five towers within 100-year floodplains, including two at the South Umpqua River, two at the Rogue River and one at Little Butte Creek (Ferris 1981b, 1982). These towers would be built on footings which are designed to withstand flooding. Construction of the transmission line would not alter floodplain characteristics or flood mechanics, and would not directly or indirectly support development within the floodplains affected.

The two towers in the South Umpqua floodplain northeast of Canyonville would occupy a total of approximately 1,300 square feet of land, or 0.03 acres; while the precise tower locations have not been established, it is probable that these sites would be on pasture land. Since the proposed 500 kV line would have longer spans than the two existing wood-pole 230 kV lines (Lines 54 and 72), replacing one 230 kV line would reduce the total number of structures in the floodplain from eight to six, as each wood-pole line now has four towers in the floodplain.

The visual impacts of the draft preferred alternative on the South Umpqua floodplain would be greatest at the point where the corridor crosses the river and Oregon Highway 227, which runs along the south bank of the river. The existing lines span the river and highway from structures on the wooded bluff north of the river, with the next set of structures located in pasture approximately 100 to 150 yards south of the highway. The lines continue in a southerly direction through more pasture land for approximately one-half mile before reaching the toe of the south valley wall. The steel 500 kV towers would be larger and more noticeable than the existing wood structures, but the northernmost floodplain tower would be further away from the South Umpqua River and Highway 227 due to the longer 500 kV spans. Vegetation clearing in and near the floodplain would be minimal for the draft preferred alternative, due to the height of the line at the river crossing and the openness of the valley. Visual impacts on the South Umpqua floodplain would otherwise be as described in the visual resources section of this chapter.

Due to existing conditions in the South Umpqua Valley, the primary concerns in this area are described above. This stretch of the river valley was identified in Chapter 2 and the Technical Investigations Report as a waterfowl nesting and rearing area, but the population using the area is small and the expected level of impact minor, as

described in the wildlife section of this chapter. The South Umpqua River is valued habitat for anadromous salmonids and other fish species, but construction activities for the preferred alternative would be some distance away from the river and should not affect local fisheries.

There are no practical alternatives to the proposed floodplain crossing which would substantially reduce floodplain impacts. The South Umpqua river must be crossed, as it runs perpendicular to the route of the preferred alternative. Agricultural activities extend up the valley for several miles eastward from the existing crossing and could not be avoided, while agricultural and residential intensity is greater west of the crossing toward Canyonville.

In the Medford area, the draft preferred alternative would require two towers in the Rogue River floodplain (Ferris 1981b, 1982), occupying 0.03 acres of what is now a riparian woodland of 100 to 150 acres. The floodplain is approximately 3,200 feet wide at this point, requiring between 5 and 7 acres of the riparian vegetation to be cleared. This riparian habitat is used by a wide variety of wildlife species, but cannot be considered a unique resource. Similar riparian woodland areas are present elsewhere along the Rogue River, including a relatively large area around Kelly Slough immediately downstream of the existing crossing.

The Rogue River crossing on the draft preferred alternative would be visible from Rogue River Drive along the west bank, Takelma Park, the river itself, and from some residences in the area. Descriptions and simulations of these visual effects are provided in the visual resources discussion. The visual impact associated with the introduction of transmission towers and lines and right-of-way clearing in this rural area would be significant.

Practical alternatives to the proposed floodplain crossing are limited. The Rogue River must be crossed at some point in order to reach Meridian Substation. Aside from the existing corridor crossing, which is described subsequently, potential crossings are highly constrained by development throughout the Medford Basin and along the Rogue River. The draft preferred alternative crossing location was selected primarily because it is in a relatively less developed area between Shady Cove and the bulk of the Medford Basin settlement. Additionally, this route was designed to remain in the hills around the edge of the basin, while the Rogue River Valley enters the much wider basin just south of the proposed crossing. The Rogue floodplain narrows to about 900 feet within two miles of the proposed crossing, but residences and farms along or near the river virtually preclude crossing at any other point in this area. South of Dodge Bridge (Route 234) the floodplain ranges from 3,000 to 4,000 feet wide above Little Butte Creek and over 4,000 feet below it, and a crossing in this part of the basin would also require many more miles of new corridor through developed areas.

The third floodplain crossing for the draft preferred alternative would be at Little Butte Creek, east of Brownsboro. One tower would be located in agricultural land at this point, occupying approximately

0.015 acres. Vegetation clearing would be minimal because the valley in this area is predominantly open. The route crossing Little Butte Creek passes through deer winter range which extends for more than 10 miles southeastward up the valley; the effect of the draft preferred alternative on this range is not significant, as described in the wildlife section.

The 500 kV line crossing Little Butte Creek would be visible from Highway 140 and from a few residences in the valley, depending upon the presence of screening vegetation. The valley is narrow enough at this point that the crossing could be accomplished by a single span, with no tower on the valley floor, but this would require towers in prominent view on the slopes on either edge of the valley (Ferris 1982). Siting one tower in the floodplain would allow the two adjacent towers to be set back some distance from the floodplain and highway, reducing overall visual impacts at this point. Spanning the Little Butte Creek Valley is the only practical alternative to this crossing if this route is selected; the valley is more intensively developed to the west of the crossing, while agricultural and residential land uses extend eastward up the valley for several miles.

The effects of the draft preferred alternative upon floodplains themselves, in terms of hydraulics or development on the floodplains, would be insignificant. Effects on floodplain resources and their significance are described elsewhere in this EIS; with the exception of visual effects at the Rogue River crossing, these floodplain-related effects are also insignificant.

Alternatives

The floodplain impacts of the parallel and double circuit alternatives would be largely the same as the impacts described above for the draft preferred alternative. Two towers would be located in the South Umpqua River floodplain in each case, while the substantive differences among alternatives would primarily relate to appearance. The parallel alternative would result in a total of three lines crossing the floodplain, rather than two, while the double circuit alternative would involve larger, more noticeable towers than the preferred alternative. Since these three alternatives follow the same basic configuration below Ramsey Canyon, there would be no significant differences in floodplain impacts at the Rogue River and Little Butte Creek. The no action alternative would avoid these impacts. The new preferred alternative would require the same number of towers to be located in floodplains, but would result in different impact types and distribution, as described below for Option I.

Options

Options H through M would involve considerable variation in floodplain effects within the Medford Basin. Options H, I, (part of the new preferred alternative), L and M pertain to the existing crossing of the Rogue River near Lower Table Rock, Option K would affect the floodplain areas along the draft preferred alternative, and Option J could apply to either Rogue River crossing. The effects of Option K, the draft preferred alternative ultimate development, would be the same as for

the draft preferred alternative until some future point when a second line would be needed. Additional right-of-way through the Rogue and Little Butte Creek floodplains would be acquired initially, but this would not result in any additional visible impacts. If and when the second line is constructed, the number of floodplain tower sites (3) and area of clearing (7-9 acres) would be approximately the same as for the initial line unless transmission construction practices change.

Development of any of the four existing corridor options (H, I, L or M) would require three towers to be located in the 3,800-foot wide floodplain at the existing Rogue River crossing (Ferris 1981b, 1982). These towers would occupy less than 0.1 acre of cropland and riparian habitat north of the main channel of the river. The riparian area at this crossing is not heavily wooded, so clearing would be much less extensive than for the draft preferred alternative. The new preferred alternative (Option I) and Option H would require 125 feet of clearing through the wooded area, compared to the 137.5-foot right-of-way of the ultimate development options (L and M).

The visual impacts which would be associated with these options are described in the visual resoures section. This crossing would not be highly visible due to its distance from public roads, although the double circuit towers of Options L and M would be more visible than in the other cases. Additionally, the 500 kV crossing would be adjacent to a 230 kV line and near a gravel pit, reducing the incremental visual impact. Overall, the primary concern would appear to be related to wildlife, particularly the potential for waterfowl collisions; this is discussed in the wildlife section of this chapter. Alternative crossing points in the vicinity of the existing crossing are highly constrained by the Kelly Slough area to the west and irrigated agricultural lands to the east.

Development of Option J represents a trade-off between temporary and long-term impacts and between visual impacts and other potential resource impacts. Actual ground disturbance resulting from equipment movement and trenching would be slightly less than 4 acres within the Rogue River floodplain at the draft preferred alternative crossing and nearly 4.5 acres at the existing crossing. Depending upon centerline placement, wooded areas requiring clearing would probably comprise approximately half of the draft preferred alternative crossing and 10 to 20 percent of the existing crossing. While surface disturbance (other than clearing) would be greater for an underground crossing, selection of Option J would eliminate the need for structures within the floodplain and thereby substantially reduce long-term visual impacts or hazards to waterfowl.

ECONOMIC CONDITIONS

The proposed transmission line project would have direct and indirect effects upon economic conditions in the project area. Direct effects would consist of potential changes in the use, productivity, and value

of the land occupied by or adjacent to the line. Indirect effects meriting attention in this document consist of local economic impacts associated with construction workers and expenditures, and effects of the project on Pacific's rate payers. While these impacts may be perceived as substantial by some local residents, particularly individual landowners along the transmission route, it is evident from the following discussion that the project will have minor economic impacts on agriculture, forestry, local tax bases, employment, and income. The no action alternative would avoid the minor adverse effects on agriculture and forestry, but would lead to the possibility of other, more widespread negative consequences.

AGRICULTURE

The extent to which physical effects on agriculture translate into economic impacts is difficult to quantify. The proposed line's interference with farming practices would ultimately enter into the economic returns of the individual farmers affected, but these effects would vary along the route with type and volume of production, method of irrigation (if present), the size of fields and of equipment used, and other factors. In order to provide estimates of the range of possible economic effects on agriculture, some broad assumptions have been made concerning these factors.

The vegetation/land cover classification effort identified 14.8 miles of agricultural land along the entire route of 146.8 miles. (This figure is a much more accurate reflection of current conditions than the potential soil productivity data cited earlier; most of the land classified as agricultural by soil type is simply not under cultivation at present.) The total right-of-way area on agricultural land would be 314 acres (21.2 acres/mile) for the draft preferred alternative and Alternatives 2 and 3. Using the standard factor of 4.3 towers per mile, a maximum of 64 towers would be located on farmlands under any of these alternatives. Strictly for purposes of providing a uniform standard upon which to measure potential impacts, it will be assumed that all of the farmland along the route is and will be used for the production of alfalfa hay. Some farmland along the route above Ramsey Canyon is actually used to produce grass seed or orchard or row crops, while most is used for pasture and grass hay. Although much of the Medford Basin is intensively farmed and irrigated, agricultural land along the routes of the alternatives and options is almost exclusively pasture and hay land. An average yield of 4 tons of hay per acre per year will also be assumed, a very conservative figure in view of the overall 1978 Oregon yield of 2.52 tons per acre (U.S. Department of Commerce, Bureau of the Census 1980).

A reasonable estimate of the potential agricultural losses would be based upon the number of towers located on farmland. Given the typical tower base area of approximately 0.015 acre, a larger area of 0.1 acre per tower could be considered a very conservative or pessimistic estimate of the area of lost production. This figure does not explicitly capture such problems as lost operating time, but overstates the uncultivated area around tower bases and the effect of overlapping operating patterns. The total acreage lost at 64 agricultural tower sites would be 6.4 acres. With a yield of 4 tons of hay per year and a price of $100 per ton, the corresponding volume and value levels for this area would be 25.6 tons of hay per year at a value of $2,560.

One year's production would be lost on lands disturbed during construction. At 0.5 acre per mile disturbed, this one-time production loss for 14.8 miles of agricultural land would be 29.6 tons or $2,960.

The aggregate gross production losses which would occur from development of any of the alternatives would probably be close to the latter estimate, although this would not reflect net value after subtraction of production costs. Because most of the farmlands crossed by the route are in the bottoms of valleys which are perpendicular to the route, the longest continuous farmland section under the proposed line would likely be about 0.6 miles. If this were all under one ownership, the maximum possible loss in annual income for any individual farmer would be 0.3 acre and $120. Farmers would presumably identify and be compensated for their losses as a result of their easement negotiations with Pacific. While some individual farmers would be likely to feel that they were significantly affected by the proposed line, the minor volume and value of lost production indicates that agricultural effects of all alternatives and options would be insignificant.

FORESTRY

Construction of the 500 kV transmission line would create a variety of forest-related economic impacts concerning timber harvest volumes and values; logging and wood products employment and income; indirect jobs and income dependent upon timber harvesting and processing; and yield taxes or other forms of public revenues derived from timber harvest. The estimated effects of the project on these variables are presented below and are summarized in the discussion which follows, and supporting information is included in the Technical Investigations Report and the land use section of this EIS.

Forest clearing and right-of-way acquisition associated with the draft preferred alternative would result in a maximum aggregate annual loss of 39.8 thousand cubic feet (MCF) or 207.2 thousand board feet (MBF) of timber (as shown in Table 3-8), assuming the productive capacity of the entire right-of-way and off-corridor access road areas is foregone. These figures incorporate the offsetting effect of allowing the

existing Canyonville, Green Mountain and West Fork Evans Creek corridor sections to revert to timber production. Right-of-way clearing could produce a minor short-term increase in the local timber harvest from private lands; total BLM timber harvest would remain as programmed. If the average standing volume on the proposed right-of-way is conservatively estimated at 20 MBF per acre (the 1978 average for BLM's Jackson Sustained Yield Unit was about 14.4 MFB/acre; USDI BLM 1979c), clearing all 647 acres of new right-of-way would yield about 12.9 million board feet (MMBF). Clearing for the parallel alternative would yield about 28.5 MMBF under the same factors. In comparison, the annual timber harvest in Douglas County alone has consistently exceeded 1,500 MMBF in recent years (Douglas County Planning Department 1979).

TABLE 3-8

COMPARISON OF TIMBER-RELATED ECONOMIC IMPACTS

Long-Term Losses	Draft Preferred Alternative	Alternative 2 Parallel	Alternative 3 Double Circuit	**New Preferred Alternative Alternative 4**
1. MBF/Yr	207.2	647.2	207.2	**170.2**
2. Annual timber value	$46,620	$145,710	$46,620	**$38,300**
3. Annual yield tax	$ 2,273	$ 7,103	$ 2,273	**$ 1,867**
4. Annual O and C payments	$ 5,827	$ 18,214	$ 5,827	**$ 4,787**
5. Timber employment	1.26	3.95	1.26	**1.04**
6. Timber earnings/yr	$25,704	$ 80,580	$25,704	**$21,216**
7. Total jobs	2.33	7.31	2.33	**1.92**
8. Total earnings/yr	$43,697	$136,986	$43,697	**$36,067**

The value of the timber cleared from the right-of-way for the draft preferred alternative would be about $2.9 million, assuming an average stumpage value of $225 per MBF. This yield would partially offset the economic loss of future timber values, even under conditions of rising real timber prices, due to the effects of discounting on future income. Timber sales from right-of-way clearing would also provide some immediate revenues to local governments in the project area. Approximately 75 percent of the timber along the proposed route is privately owned, with the remainder on BLM lands. The State of Oregon yield tax of 6.5 percent on private timber would therefore provide over

$140,000 of tax revenues, to be redistributed locally according to formula. Applying the O and C payment rate (the major item in BLM's payments to state and local governments) of 50 percent to the remainder would yield approximately $360,000, to be distributed to the O and C counties of western Oregon. The O and C payment figure would not represent a net increase, however, as the right-of-way volume would have to be offset by a like reduction elsewhere on BLM lands in order to remain at the programmed harvest level.

The annual timber volume foregone due to the project would have a value of about $46,600 for the entire route of the draft preferred alternative. The annual tax revenues from 207.2 MBF of harvested timber, with the 75/25 percent ownership distribution, would be about $2,300 of state yield taxes and $5,800 of O and C payments. Using a basic discount rate of 10 percent, and allowing for a two percent annual escalation in stumpage values, the maximum potential timber growth within the corridor over a 40-year project life would have a present worth of roughly $550,000.

A minor long-term reduction in forest-related jobs and income could be attributed to the lost timber production associated with the project. Although project right-of-way clearing can be assumed to represent a small one-time increase in local private timber harvest, the project cannot be credited with creating a short-term increase in timber-based employment. Conversely, the annual timber volume which could be produced on the right-of-way would support a given level of employment in logging and wood processing, jobs and income which would in turn support additional indirect economic activity in the local community.

The estimates in Table 3-8 of timber-based employment and income lost as a result of the project are based upon research on employment/wood consumption relationships conducted by U.S. Forest Service economist Brian Wall for BLM (USDI BLM 1978d, 1979c). Estimates for 1980 and 1990 of employment in logging, sawmills, and veneer and plywood mills per million board feet of timber harvested and processed within the Medford timbershed were as follows:

County	1980	1990
Douglas	6.44	5.81
Jackson	6.98	6.12
Josephine	5.49	4.86
Klamath	5.65	5.00

Given these ratios, the distribution of the affected forest lands, and the planned 1985-88 construction period, a composite figure of 6.1 jobs per million board feet was determined to be appropriate as an average factor for all project alternatives. Accordingly, the annual loss of 207.2 MBF of timber through the draft preferred alternative would technically result in an expected reduction of 1.26 timber-based jobs in the entire study area (see Table 3-8). Based upon an estimated composite annual income of about $20,400 (in 1981 dollars) among lumber and wood products workers in the region (USDI BLM 1979c), the annual direct income associated with this employment level would be $25,704.

Composite employment and income multipliers were selected in a similar fashion, based on individual county multipliers developed for the Jackson-Klamath Timber Management EIS (USDI BLM 1979c), in order to estimate the indirect economic effects of the reduced timber harvest. An average employment multiplier of 1.85 and on income multiplier of 1.7 were used for this calculation, resulting in a total direct and indirect loss attributable to the project of 2.33 jobs and $43,697 of income.

The differences in the timber-based economic impacts of the proposed line and Alternatives 2, 3, and 4 are presented in Table 3-8. The timber-related impacts of the parallel alternative would be greater than for the draft preferred or double circuit alternative, although still minor on a regional or community basis. The annual value of lost timber production for Alternative 2 would be over $145,700, compared to about $46,600 for the draft preferred alternative. The present value of the annual losses for the parallel alternative over a 40-year project life would be about $1.7 million. The maximum total (direct and indirect) employment and income loss would be 7.31 jobs and about $137,000 under Alternative 2. Changes in these impact levels resulting from any of the options would be very minor, particularly in regard to jobs and income. The largest change would result from Option B, the new corridor from Twin Oaks to Camas Swale, which would result in an additional potential value loss of about $11,100 per year. Compared to existing harvest values and timber-based employment and income levels in the surrounding area, the effects of the project alternatives and options would be insignificant.

PROPERTY VALUES AND TAX BASE

The proposed transmission line may arguably have an effect on property values in and adjacent to the corridor, and therefore upon local tax bases, although the overall effect to local tax bases would be positive due to the economic value of the line. Property owners whose land is required for the transmission line right-of-way realize direct initial property value effects, but also are directy compensated for their losses. Whether the constructing utility purchases an easement or the land in "fee simple", it must be asssumed that through the process of negotiation or court settlement the landowner generally receives fair compensation for the loss or restriction of use of the property, and any resulting loss in market value. These acquisition costs are incorporated into the construction cost estimates, although compensation levels cannot be estimated precisely prior to the actual negotiations.

The purchase of land or an easement for a transmission right-of-way severely limits the use of the land, or removes it from production as in the case of cleared forest land. This impairment of use or productivity theoretically reduces the value of the land, which should be reflected in subsequent property tax assessments. According to the Bonneville Power Administration (1977b), however, county tax assessors have rarely responded to right-of-way easement acquisition by reducing the assessed value of the property in question. Any possible reduction in assessed right-of-way land values would be heavily outweighed by the assessed value of the taxable portion of the transmission line itself.

The primary property value issue is the effect of a transmission line on residential properties close to but not within the right- of-way. In past cases, and at previous public meetings related to the proposed Eugene-Medford line, owners of adjacent or nearby land have voiced the opinion that the value of such properties are reduced without compensation. This question has been the subject of academic, real estate, and utility research for more than two decades, but the results of this research remain inconclusive. Most of these studies have concluded that property values off the right-of-way were not appreciably affected by the presence of a transmission line (BPA 1977b). Mountain West Research, Inc. (1982) recently submitted a draft report to BPA on a comprehensive literature review on property value effects of transmission lines, finding that 5 of the 27 studies reviewed concluded that there was an adverse effect, 5 concluded no effect, 7 concluded no significant adverse effect, and 10 were inconclusive or internally contradictory.

A significant factor in this body of research is the methodology of the various studies, as many of the studies failed to properly control for all factors that might have affected property values. In one recent study (reviewed by Mountain West) that is rather widely cited and recognized as being methodologically sound, Colwell and Foley (1979) found that proximity to a transmission line was associated with diminished selling prices in two residential neighborhoods in Decatur, Illinois. The researchers determined that over a ten-year period the median sales price of homes located 200 feet from the transmission line were about 6 percent higher than for comparable homes located 50 feet from the line, and that the transmission line appeared to have little impact on price beyond 200 feet. Blinder (1979) found largely contradictory results in a similar controlled study of two subdivisions in the metropolitan area of Maryland, a study that was not reviewed by Mountain West. Blinder concluded that lot premiums for properties adjacent to a transmission line in one subdivision were reduced by an amount equal to 1 or 2 percent of the total price of the property, but that the value of the house itself was not affected. The transmission line was found to have no effect on lot premiums or total prices in the second subdivision.

Research conducted to date on the property value effects of transmission lines has clearly produced conflicting results, and currently does not substantiate either the "adverse effect" or "no effect" arguments (Mountain West Research, Inc. 1982). Further difficulty in applying the research results to the proposed Eugene-Medford line arise because the previous studies were primarily conducted in the eastern and southwestern U.S., and none pertained to Oregon or the Pacific Northwest. The only conclusions which can properly be drawn are that any potential effects could vary widely from case to case, and that reliable forecasts of the aggregate effect on property values cannot be based on this research.

Information and opinions obtained from individual real estate appraisers substantiate the necessity of evaluating each property individually. They also indicate that appraisers rarely assign value losses to properties that are not actually encumbered by a transmission line

right-of-way. In general, there seldom is a measurable value loss to properties near or crossed by transmission lines, unless the size or shape of a lot is such that the transmission line precludes development (Pilmer 1981). It has been BPA appraisal experience that economic damage to land outside of the right-of-way is very seldom found; the BPA appraisal chief could recall only one such case, in which a 12 percent value reduction was found on several ownerships in a small subdivision in eastern Washington, up to 100 feet from the right-of-way edge; these ownerships were also crossed by the transmission line (Hansen 1982). Other appraisers who have had experience with transmission lines and/or properties in the project area indicated that the presence of a transmission line may narrow the market (the number of potential buyers) for a particular property, but that the market does not generally or uniformly assign a value loss to all properties near transmission lines (Holt 1982; Meyer 1982; Miller 1982). These appraisers also stressed that each property represents an individual case, in which the entire property must be evaluated relative to its highest and best use, the size of the line, and orientation to the transmission line before any conclusion can be reached concerning impact on market value.

A recent court decision concerning a 500 kV BPA powerline in Wasco County, Oregon indicates the significance of properly establishing the highest and best use of a particular property. In the condemnation case of U.S. v. Abbott (U.S. District Court, Oregon District, Civil No. 79-403, 1981), the court found significant value damage to property that was not within the right-of-way. The landowner was awarded damages equal to 12 percent of the fair market value of the entire off-corridor portion of the property. In doing so, the court valued the property in question on the basis of its development potential as recreational home sites, rather than according to its current use as agricultural and range land.

Despite its apparent implications, the parallels which can be drawn from this case are limited. The case of U.S. v. Abbott illustrates the possible results of a "partial taking" of a formerly contiguous parcel under the same ownership and use. Compensation can be awarded for the land in the parcel not directly affected by the taking (the "remainder land," in legal terminology), but only if the court finds that the remainder land has been damaged. This decision supports the established legal principle that a parcel encumbered by a transmission easement can be valued at a higher (than current) use, but it does not indicate that this will always happen. More importantly, the results of this case cannot be applied to parcels that are not encumbered by an easement or do not meet the legal definition of remainder land.

Given the inconclusive and sometimes contradictory information on the property value effects of transmission lines, no precise identification or assessment of such impacts can be made. It is certain that many landowners whose properties do not abut the transmission line easement will feel that the value of their property has been diminished. There is some evidence to indicate that this could occur in individual cases. Such cases cannot be identified at this time, however, because the precise alignment of the transmission line within a quarter-mile wide corridor has not yet been located. Ultimate property value effects

cannot be estimated until the line is surveyed and tower sites located, after which individual properties are appraised. Moreover, there is no valid or credible basis for arbitrarily assigning a percentage loss figure to all properties near the route for the purpose of developing aggregate impact forecasts.

Pacific's portion of the transmission line would provide a minor increase in the property tax bases and revenues of Lane, Douglas and Jackson Counties. BPA does not pay property taxes, so its portion of the line would not increase the tax base of Lane County. Private utility property in Oregon is centrally assessed by the Oregon Department of Revenue. Utility assessment is essentially a three-step process in which transmission lines are included with distribution facilities in the rural wire plant value, which is a residual value left after generating plant and "situs" properties (such as substations) are valued and apportioned separately (Arrowsmith 1982). The wire plant residual value, which is not a true value of all transmission and distribution facilities, is then apportioned to taxing districts through a mechanical formula based on wire miles.

In some cases the Revenue Department has assessed a specific transmission line on a "situs" basis if the actual cost of the line is known, although all transmission lines eventually are incorporated into the wire plant residual. While the cost of the Eugene-Medford 500 kV line would be known, the value of the line would probably be melded into the residual because there are so many existing transmission lines in the area (Arrowsmith 1982). The construction period would provide a limited exception to this treatment, as construction work in progress is assessed on a situs basis.

Because transmission lines have assigned values rather than appraised values, the actual assessed value of the new line cannot be estimated on the basis of its cost. Instead, the tax base and revenue effect of the line must be estimated on the basis of typical values, which generally range from $10,000 to $20,000 per wire mile. Since each of the proposed line's three phases would consist of a three-conductor bundle, each route mile of the 500 kV line would equal nine wire miles for tax assessment purposes. The eventual tax base effect would therefore range from $90,000 to $180,000 per mile of line, with no distinction between alternatives (assuming only one circuit is strung initially for the double circuit alternative) due to the nature of the assessment system.

Approximate data on route mileage and tax base effects in each county for the draft preferred alternative are provided in Table 3-9, with the value data based on a mid-range wire-mile figure of $15,000. Using these valuation factors, the proposed transmission line would increase the assessed valuation of Lane County by about $4 million, Jackson County by nearly $5.7 million, and Douglas County by about $8.9 million. The relative impact of these increases would be insignificant, as the line value would amount to less than one-quarter of one percent of the estimated 1981 total assessed valuation in each county; the lowest

TABLE 3-9

TAX BASE EFFECTS

County	Route Miles	Wire Miles	Line Value (Thousands)	Line Value as Percent of Total Assessed Value[1]
Lane[2]	30	270	$ 4,050	0.03
Douglas	66	594	$ 8,910	0.24
Jackson[3]	42	378	$ 5,670	0.12
Total[3]	138	1,242	$18,630	—

[1] See Technical Investigations Report, Table 7-11, for estimates of 1981 total assessed valuation in each county.
[2] Portion of line in Lane County to be built by Pacific; over nine miles of line would be tax-exempt BPA property.
[3] **Taxable portion of new preferred alternative would include approximately 2.1 fewer route miles in Jackson County, resulting in reduction in County and total line value of about $280,000.**

assessed valuation was an estimated $2.6 billion in Douglas County. Assuming an average combined levy rate of $15 per $1,000 of assessed valuation, the proposed line would generate a total of nearly $280,000 of tax revenues annually. If this tax rate existed in all three counties (an unlikely occurrence), county receipts would range from about $60,000 in Lane County to over $130,000 in Douglas County. These figures would be insignificant compared to the operating budget levels or total government receipts in the respective counties. Property tax receipts to the counties would be considerably higher during the construction period, particularly if the double circuit alternative were selected.

CONSTRUCTION LABOR FORCE AND EXPENDITURES

The maximum construction force for the Pacific portion of the project would number approximately 200 workers, to which would be added a supervisory and inspection work force of 25 (Pacific 1981a). With the exception of tower assembly, erection and stringing crews, workers for

the clearing, foundation, pad construction, and similar operations would be hired locally. It should be possible to hire 60 to 70 percent of the construction workers from the local labor force under normal labor conditions (Pacific 1981a), thereby reducing the possibility of noticeable socioeconomic impacts from an influx of workers. The percentage of local hires would be much less if local labor is in short supply, perhaps in the range of 25 to 35 percent.

Socioeconomic effects associated with the construction labor force would be further diffused by the scheduling and staging of construction work elements. The Pacific portion of the line would be constructed in segments by crews operating out of major staging areas, which would probably be located at Cottage Grove and Grants Pass (the base location is usually determined by negotiation between the contractor and the workforce; Pacific 1981a). Personnel working out of these bases would be clustered in smaller groups according to individual operations in the construction process. Therefore, several crews based near Cottage Grove would be distributed along the length of the Spencer-Dixonville segment during the 1985 construction season, and several crews based near Grants Pass would be distributed along the Dixonville-Meridian segment during the 1987 and 1988 construction seasons.

The local share of the transmission line construction jobs would be filled from a multi-county labor pool. For the first phase, from Spencer to Dixonville, this labor pool would essentially consist of construction workers in Lane and Douglas Counties. Combined construction employment in these two counties during 1978 averaged 6,879 workers, including 1,298 workers with heavy construction contractors (see Technical Investigations Report, Sec. 7.2). The second phase of the project would generally draw workers from Douglas, Josephine, and Jackson Counties, which together had 4,125 construction employees and 902 heavy construction workers in 1978. The local labor demand of 120 to 140 workers would be equivalent to about 2 percent of the 1978 total construction labor pool and 10 percent of the heavy construction pool for the Spencer-Dixonville phase of the project; corresponding figures for the Dixonville-Meridian phase would be about 3 percent and 14 percent. Since each local labor pool is likely to be larger in 1985 than in 1978, and most or all clearing work is likely to go to local logging contractors, the local labor demands of the project would not be likely to strain the available labor supply.

The non-local component of the construction labor force, which is expected to consist of 85 to 105 construction workers, supervisors and inspectors, can be considered a very minor temporary increase in the local economic base. The greatest relative effect would be in Josephine County, given a projected staging area at Grants Pass; the maximum nonlocal workforce of 105 persons would be equal to approximately 0.4 percent of the non-agricultural wage and salary employment level in Josephine County for 1980 (Technical Investigations Report, Sec. 7.2). The non-local workers are unlikely to bring many dependents with them due to the staging pattern and short duration of

the project, so the temporary population gain would be little more than the employment increase (see Social Conditions). Similarly, the temporary economic stimulus represented by the non-local work force (and by local purchases of project materials and supplies) would be so small and brief that it should not lead to any indirect or induced employment increases in supporting activities. These conclusions are supported by recent research on the socioeconomic impacts of transmission line construction projects (Mountain West Research, Inc. 1981), which found that the nature of these projects generally limited their local economic impacts to temporary increases in business activity.

Construction in the Eugene area would be the responsibility of BPA. Once work began, the only agency personnel directly involved would be the construction inspection staff, which would probably consist of a chief inspector and three other inspectors. They would be present for the single construction season during 1985. Actual line construction, including clearing and excavation, as well as tower assembly, erection and conductor stringing, would be done entirely by private contract. Workforce size is difficult to project, since BPA has no control over the number of workers or their origin. Experience on similar projects indicates that approximately 35 to 45 workers would be needed to complete construction of the draft preferred alternative (Beraud 1982b). An estimated minimum of 25 percent of that total, or 8 to 10 workers, would be hired from the local area; the actual local/non-local distribution would depend largely on the home location of the prime contractor. Most of the general work such as clearing and access road construction could be performed by local crews, while a smaller proportion of workers for the more specialized tasks such as conductor stringing would be local hires. Due to the small construction workforce required for the BPA portion of the proposed line, the local labor force effect on economic activity in the Eugene area would be insignificant and would parallel the effects described previously for the Pacific portion of the line.

The most noticeable economic effects of the project would probably be slight increases in expenditures in some highly localized areas, due to the partial re-spending of payrolls by non-local workers. Based upon typical construction cost data, the total construction payroll for the draft preferred alternative is projected at approximately $12.8 million (in 1982 dollars), expected to be divided equally between the two phases of project construction (Higgins 1981a; USDOE BPA 1980b). Total labor income for the Dixonville-Meridian phase of the project ($6.4 million) would be equivalent to less than 1.5 percent of total annual personal income for Josephine County (Technical Investigations Report, Sec. 7.3).

If the non-local share of total project payroll is estimated at 45 percent, the non-local payroll would be nearly $2.9 million for each phase and about $5.8 overall. Assuming that 70 percent of gross pay is disposable income and that non-local workers would spend 40 percent of their disposable income in the local area, expenditures by these workers would total approximately $1,625,000. The Grants Pass and Cottage Grove areas would receive the largest shares of this total, but worker (both local and non-local) expenditures would be distributed in an unpredictable pattern throughout many communities near the project. The aggregate spending effects would not be significant, although individual proprietors might realize substantial increases in trade. Most of the increased spending would occur in the service and retail trade sectors of the local economies.

These employment, income and related impacts would be very similar across all alternatives and options. The size of the construction crew should be essentially the same for each alternative, although the double circuit alternative would probably take somewhat longer to construct and would have a larger total payroll. Total labor income for the double circuit alternative would probably be on the order of $19 million, with a non-local share of about $8.5 million. The total construction payroll for the shorter new preferred alternative would be in the vicinity of $11.2 million, with a non-local share of slightly more than $5 million. Selection of any of the options would have at most a marginal effect on total payroll and socioeconomic effects, although some of the options would affect the local-scale geographic distribution of workforce impacts. For example, selection of Option H over the draft preferred alternative for the Medford Basin would shift a portion of local construction worker expenditures and activities from the Shady Cove-Eagle Point and Brownsboro areas to some of the communities on the western side of the Medford Basin.

EFFECT ON RATEPAYERS

The cost of the proposed 500 kV transmission line would be borne by Pacific's industrial, commercial and residential customers, hence electric bills would be expected to rise to cover the cost of the project. Under existing regulatory practices a system improvement such as the proposed facility would be spread over five states in Pacific's six-state service area. The actual rate impacts to customer bills are difficult to predict, as some state rate-setting agencies could disallow any of the project cost to be applied to Pacific's customers in their state or grant a request by Pacific to recover the cost of the project in its entirety. Rate schedules also vary significantly across jurisdictions and ratepayer classes. Further complexities in predicting the rate impact of the project arise as a result of Section 5(c) of the Pacific Northwest Power Planning and Conservation Act.

For Pacific's six-state service area, total annual revenue requirements would increase by approximately $16,000,000 to cover the cost for construction, operation and maintenance of the facility as proposed. The Oregon portion of the total annual revenue requirements would be approximately $9,000,000 or a two percent increase in current Oregon revenues (approximately $425,000,000). As some fixed components of the

transmission facility depreciate at different rates and as other expenses such as operation and maintenance are non-fixed and escalate with inflation, the annual revenue requirements could slightly decline over the 40 year economic life of the facility.

For a residential customer in Pacific's Oregon service area using an annual average of 14,000 kilowatt hours per year, rates would increase by approximately $6.00 per year (for electric space heating customers, approximately $9.00 per year).

These rate increases would be reflected in customer bills for each year of the estimated 40 year economic life of the transmission facility. While the amount for each customer appears small, there would be a long-term effect.

The increase would be substantially greater for Pacific's commercial and industrial customers, whose usage is significantly greater than residential customers. The rate increase would become embedded in the price structure of all goods and services these customers produce and sell in the region.

Each million dollar increase in project cost for the proposed facility would result in an annual increase in revenue requirement of approximately $230,000.

The cost of the BPA construction would be borne by BPA customers throughout the Pacific Northwest. The actual increment of cost directly related to the proposed line would be indiscernible on an individual basis.

NO ACTION ALTERNATIVE

A decision to adopt the no action alternative could result in several types of adverse consequences to Pacific's transmission and distribution system, which could in turn adversely affect economic activities in the southern Oregon-northern California service area. In general, the adverse electrical consequences could range from intermittent low voltage conditions to occasional short-term outages to major outages and/or severe restrictions in additional load growth. The chances of the more severe electrical consequences occurring would depend upon several uncertain factors, including the probability of normal outages when system back-up capacity is not available, the probability of forecasted peak loads actually occurring, and consumer response to warnings of short-term system overloads or long-term restrictions on load growth.

The economic consequences associated with these types of electrical system failures would increase in severity with the duration and extent of the system failures. The effects of a brief, highly localized outage (with dropped loads) or low voltage period would primarily be limited to personal inconvenience, for example. Alternatively, a

black-out of the Grants Pass area for several hours during a weekday would have significant economic costs in the form of lost output, wages and other damages. Businesses dependent upon continuous and reliable electric service would probably move out of the service area if outages became frequent, while the most severe system consequence of a load growth moratorium could conceivably lead to economic stagnation unless alternative energy sources were employed.

The economic impacts of the no action alternative cannot be accurately predicted or quantified because of the degree of uncertainty present, but some indications of the range of possible economic effects can be provided. Studies conducted in the U.S. between 1969 and 1976 found power outage costs across all consumer classes ranging from $0.33 to $1.17 per kilowatt-hour (KWh) of power not delivered, with studies from the highly industrialized northeastern states accounting for the high end of the range (USDI BPA 1977c). Pacific's contingency plan for energy conservation during periods of resource deficiency, required by the Oregon Public Utilities Commission, provides for a surcharge on excess power usage during Stage 2 of mandatory curtailment (Pacific 1982b); these surcharge rates range from $0.04 to $0.06 per excess KWh, and probably represent an approximate minimum unit value for power not delivered.

An alternative method of estimating the impacts of power curtailment is to focus upon employment, and attempt to identify employment which might be lost during a period of power shortage. The Pacific (1981c) Southwest Division forecast estimates that manufacturing employment in the area will be 33,539 workers in 1985, and that industrial electric sales in the same year will be nearly 1.3 milion megawatt hours (MWh) or 25 percent of total area sales. If that industrial demand also represents 25 percent of the forecasted 1985-86 peakload of 1,590 MW, the resulting figure of 397.5 MW can be converted into a crude employment/energy ratio of 84.4 workers per MW of industrial peak demand.

The forecasted 1985-86 winter peak load of 1,590 MW is 108 MW above the existing transmission system capacity of 1,482 MW. If the 108 MW shortfall occurred for one week and was met by mandatory curtailment of industrial power, resulting in temporary lay-offs or plant closings, the result could conceivably be a short-term loss in industrial employment of 9,115 workers (108 MW x 84.4 workers/MW). Based upon annual earnings figures for the dominant wood products industry, such a one-week curtailment could cost workers about $3.6 million in lost wages.

These figures are a representative case of some of the economic effects which could occur if continued load growth pushed peak demand above the existing transmission system capacity. The above figures might overstate the potential loss of employment amd earnings because they ignore the potential for energy curtailment in other sectors and because energy intensity varies among industries. Conversely, the one-week curtailment scenario does not account for the possibility of other 1985-86 peak load levels above the system capacity of 1,482 MW

but below the projected maximum peak of 1,590 MW. Such lesser shortfalls could conceivably occur several times during the winter of 1985-86, with the wage and employment effects of each occurrence depending upon the time of day the peak occurs (a morning peak and resulting curtailment would have more serious effects than an afternoon peak) and its duration.

The proportion of the total service area electric load which would be exposed to curtailment would increase in every year after 1986, if load growth continued and the transmission system capacity were not increased. The potential capacity gap, and the projected peak demand which would create the shortfall, are based upon forecasted annual demand growth of 5.6 percent through 1985-86 and 3.8 percent from 1985-86 through 1988-89 (see Table 1-1). These growth rates are somewhat higher than the Oregon Department of Energy forecast for the state, which projects annual average growth of 3.5 percent through 1986 and 2.2 percent from 1986 to 1991 (Pacific 1982c). If the ODOE forecast rate were applied to Pacific's Southwest Division loads, the resulting 1985-86 peak load would be 148 MW below Pacific's forecast. The result of load growth at the lower ODOE forecast rate would forestall the capacity gap and the need for the proposed transmission line by about 1.5 years. Despite the uncertainty surrounding future electric demand and curtailment patterns, it is clear that the no action alternative could lead to highly significant adverse economic impacts if forecasted loads materialize.

SOCIAL CONDITIONS

Potential social impacts of the proposed transmission line primarily relate to construction work force activities, possible electro-magnetic effects of the operating powerline, and the attitudes and perceptions of residents near the corridor. The draft preferred alternative and Alternatives 2, 3 and 4 would create unavoidable social impacts of this nature. The impacts of construction activities would be minor and temporary, while the other effects would largely be mitigated by various actions, although some impacts such as changes in attitudes of residents near the corridor might persist. Implementation of Alternative 1, the no action alternative, could involve more significant and widespread social impacts associated with the restriction of electrical loads.

CONSTRUCTION WORK FORCE

Social impacts due to construction activities and an influx of construction workers would be minimal. As described in the economic discussion, it is expected that under normal labor conditions 60 to 70 percent of the maximum 200 construction workers would be hired locally. The remaining 60 to 80 workers would be from non-local crews, and would be joined by about 25 inspectors and supervisors.

Research on transmission line workers and the local social impacts which they create indicates that even small communities have not experienced serious social impacts as a result of recent transmission line projects (Mountain West Research, Inc. 1981). Surveys of workers on several projects in the Northwest showed that transmission line workers tend to be older on average than construction workers on fixed-site projects such as power plants (about 35 years vs. 23 to 25 years), have smaller families, and bring fewer dependents with them to the job site. Approximately 67 dependents were estimated to accompany every 100 workers, indicating that the non-local workers (including supervisors) on the Eugene-Medford 500 kV project could be expected to create a population influx of 140 to 175 persons. Additionally, non-local transmission line workers tend to establish temporary residence in communities which are large enough to provide sufficient amenities, while many bring along their own temporary housing in the form of travel trailers or other recreational vehicles. Overall, no problems concerning strained demand for public services and facilities were reported in any of the towns surveyed, which included several communities of 500 or fewer residents (Mountain West Research, Inc. 1981).

Given the size of Cottage Grove and Grants Pass, about 7,200 and 15,000 persons, respectively, the demands of the non-local workers for transient housing and other private and government services could easily be accommodated at these anticipated staging areas. Residents near the transmission route might notice increased traffic along some local roads during construction, but these effects would be highly localized and temporary due to the dispersion of work crews along the corridor. Overall, the social effects of the construction workforce within the surrounding area would be insignificant.

NOISE

The operation of construction equipment would cause localized, temporary noise levels which could be significant to individuals, depending upon distance, weather, topography, individual sensitivities, and other factors. Noise levels at a distance of 50 feet range from 70 to 96 dBA (decibels on the A scale) for various types of internal combustion powered equipment, and up to 106 dBA for impact tools and equipment (USDI BPA 1977b). Impact equipment is used very infrequently and for short periods of time during construction, primarily in the establishment of tower foundations. Contribution to hearing impairment begins at 70 dBA, a noise level which is equivalent to freeway traffic at 50 feet, while sustained noise levels of 90 dBA can cause hearing damage.

Normal attenuation or lessening of noise from a point source is 6 dB per doubled distance (USDI BLM 1977b; Wilson 1982). Intermittent construction noise above 90 dBA (equivalent to the noise of a heavy truck 50 feet away) can therefore be expected on an infrequent basis

outside the few residences which would be along the right-of-way. Noise levels inside residences near the construction would be much lower, as outside walls of houses would typically reduce high-frequency noise levels by 20 to 25 dB (Wilson 1982). Overall, construction noise would be intermittent and of short duration on a daily basis, while construction equipment would probably not remain at any given location for more than one week (USDI BLM 1977b). Noise from construction activities may also be audible as background noise at distances of one mile or more from the right-of-way. Blasting is not anticipated as a normal construction activity. Measures which would be taken to minimize construction noise are described in Appendix A.

Transmission lines also create some long-term noise effects through operation and maintenance. Use of helicopters for patrolling the transmission line might cause some intermittent, short-term noise for nearby residents, but this would occur infrequently.

The proposed transmission line would produce some operational noise effects associated with transmission line corona. Corona produces crackling and humming noises, particularly during foggy, very wet, or otherwise adverse weather conditions. Through careful selection of conductors and bundle configuration, corona noise from the proposed transmission line would be held to 50 dBA (the noise level of light auto traffic 100 feet away) at the edge of the right-of-way (Pacific 1981b). Normal attenuation would reduce this noise level to about 40 dBA, the typical sound level in a library (USDI BPA 1977a) at approximately 300 feet from the centerline. Previous BPA experience indicates that residents living near a transmission line can be expected to complain if the average noise level is in the range of 53 to 59 dBA (USDI BPA 1977a, 1982b). Substations emit varied noises of differing frequencies, some of which are louder than corona noise. Transformers in particular emit a low-frequency, long-wavelength hum which penetrates walls and can be very annoying (Wilson 1982). Public access to substations is controlled, thereby limiting the noise impacts of these facilities. Modification of the Dixonville Substation within the existing property should not lead to an increase in the noise level at the residences and the school located near this facility.

Operational noise from the proposed transmission line would represent a minor change from ambient (background) conditions, and only within a short distance of the edge of the right-of-way. Existing ambient noise levels along the potential routes vary widely, from noisy urban-industrial conditions north of Medford to generally undisturbed quiet in many rural areas. High urban ambient sound levels generally range around 80 dBA, although noise from an airplane flying overhead at 1,000 feet can reach 88 dBA from propeller-driven planes and over 100 dBA for jets; the lower limit of urban ambient sound is about 40 dBA (Douglas County Planning Department 1980). Rural ambient sound levels are typically lower than the latter figure, although they can average from 35 to 45 dBA when it is raining (USDI BPA 1977a). In comparison,

the average sound level during rainy conditions from the type of 500 kV line proposed would be 50 dBA or less under the lines, dropping below 40 dBA at about 275 feet from the centerline (USDE BPA 1977a, 1982b). Consequently, the corona noise would probably be indistinguishable from the background at greater distances from the centerline, and would be near ambient levels between this point and the edge of the right-of-way. Within 300 feet of the centerline, corona noise would be audible only to persons outdoors, but would not be discernible inside buildings except near open windows. Corona noise from the 500 kV line would be about 5 dB above the noise from a 230 kV line (typically about 45 dBA during rain near the edge of the right-of-way; USDOE BPA 1982a), which would represent the difference between existing and proposed conditions along most of the route.

Overall, noise impacts of the proposed line would be held to acceptable levels through the efforts of the constructing entities, BPA and Pacific. BPA would conduct its activities on the northern portion of the line in compliance with regulations established under the federal Occupational Safety and Health Act of 1970 (29 U.S.C. 553), and guidelines issued by the U.S. Environmental Protection Agency under the Noise Control Act of 1972 (42 U.S.C. 4901 et seq.). BPA follows the intent of the Noise Control Act and subsequent Executive Order 12088, which is for federal agencies to comply with state and local noise standards (USDOE BPA 1980a).

Pacific would be required by EFSC to conduct its activities in conformance with the Noise Standards of the Oregon Department of Environmental Quality, set forth in OAR 340-35. The proposed transmission line would be covered by the standards for new industrial and commercial noise sources, which allow median noise levels at the nearest noise-sensitive property (residences, churches, schools, etc.) of 55 dBA during daytime hours (7 A.M. to 10 P.M.) and 50 dBA at night (OAR 340-35-035). Standards for intermittent noises above these levels allow nighttime (the controlling standard) peaks of 55 dBA during 10 percent of any given hour, and 60 dBA during 1 percent of any given hour. In addition to these basic standards, new corridor and parallel transmission segments may need to comply with a degradation standard for "previously unused sites," which would allow an increase of no more than 10 dBA over the previously existing ambient noise level (Wilson 1982). Transformers and equipment emitting low frequency noise in the 125 Hertz octave band would have to comply with median octave band standards, which would allow median levels of 61 dBA during the day and 56 dBA at night, with a maximum increase of 15 dB over existing levels (Wilson 1982, OAR 340-35-035).

ELECTRIC AND MAGNETIC EFFECTS

All transmission lines create some risk to human health through line failures or inadvertent contact with conductors. Energized conductors can fall to the ground due to damage from vandalism, storms or landslides, resulting in a very brief hazard (about 1/2 second) before the line is automatically switched off (USDOE BPA 1980a). There also

is a slight collision hazard for low-flying airplanes. The risk of electrocution through accidental conductor contact with irrigation pipe or other objects is somewhat higher, but is minimized by siting to avoid irrigated agricultural areas, increasing the minimum clearance between the conductors and the ground from 38 to 42 ft. in agricultural lands (Pacific 1981a), and by distributing information concerning such hazards. Moreover, the contact hazard associated with the proposed 500 kV line would be less than for the existing 230 kV line, because conductor height from the ground increases with voltage. Pacific and BPA both have standard grounding specifications for fences, buildings and other objects near or in the right-of-way, which minimize induced current in these objects and the resulting risk of nuisance shocks (Higgins 1981b, USDOE BPA 1978). These specifications are in accordance with the National Electric Safety Code.

Energized transmission lines also produce electric and magnetic fields in their immediate vicinity. The maximum electric field strength measured at one meter above ground level under a 500 kV line typically is about 8 kilovolts per meter (kV/m), usually occurring just beyond the outer conductor; this level typically diminishes to about 2 kV/m at the edge of the right-of-way (USDOE BPA 1982b). Pacific estimates that the maximum electrical field for the proposed line would be less than 7.7 kV/m (Fishback 1982) declining to 3 kV/m at 75 feet from the centerline (Ferris 1983). The earth's electric field at ground level averages 0.13kV/m, and can rise to 3 kV/m during storms (USDI BPA 1977a). The magnetic field from the proposed 500 kV line measured at a height of one meter above the ground would be a maximum of about 0.5 gauss (Ferris 1983). In comparison, the earth's magnetic field strength is also about 0.6 gauss, while a television set creates a magnetic field of over 0.8 gauss within 6 inches of the set (USDI BPA 1977a).

Although there has been public concern over the health effects of long-term exposure to electric and magnetic fields, scientific research conducted to date has not concluded that 500 kV transmission lines (or other high-voltage lines) constitute a health hazard (USDI BLM, USDA Forest Service, USDOE BPA 1981c). While research on potential field effects is continuing, comprehensive reviews of the extensive body of existing research literature (USEPA 1980; ODOE 1980; USDI BPA 1977a, 1982b) indicate that the proposed line would present no significant health hazard to people or animals.

Pacific and BPA would comply with the State of Oregon standards concerning electric fields, as established by EFSC (OAR 345-80-055). These standards require that electric field strengths not exceed 9 kV/m one meter above the ground surface in the areas accessible to the public, that induced currents be as low as reasonably achievable, that the applicant agrees to an adequate grounding program, and that the transmission line be designed, built and operated consistent with the National Electric Safety Code.

The proposed transmission line might create interference with reception of radio and television signals. Previous experience has indicated that 500 kV power lines occasionally interfere with television and AM or CB radio signals (USDOE BPA 1981c). Such interference is generally limited to wet weather conditions and relatively remote locations where broadcast signals are weak. Restoration of radio and television reception at residences and commmercial establishments to the original level is a binding EFSC standard (OAR 345-80-055) with which Pacific and BPA would comply. As a matter of policy, both Pacific and BPA consider effects on other telecommunications facilities as well, such as those owned by telephone companies and railroads.

HERBICIDES

Use of herbicides to control vegetation within the right-of-way is likely to be a public issue associated with the project. Herbicide use in timber management and other vegetation control activities is controversial, and many Oregon residents strongly oppose herbicide use because they believe that it is harmful to the environment and to human health. Potential adverse effects associated with herbicide use for the proposed transmission line would be minimized through the standard practices described in Chapter 1: herbicide use would be limited to ground application, except possibly along the BPA portion of the line; extreme care would be taken in regard to drift during application; handcutting and stump treatment would probably be used in sensitive areas where great selectivity would be required; and individual landowners would be able to enter into Tree and Brush Agreements to prevent the use of herbicides along their property. While these measures would effectively preclude any human health effects associated with herbicide use during maintenance, it is doubtful that they would preempt all criticism and concerns of the opponents of herbicides. Accordingly, some social opposition to the project on the grounds of herbicide use is likely to be unavoidable.

OTHER SOCIAL EFFECTS

The remaining social impacts relate to the proposed action's effects on local residents' attitudes and perceptions. Transmission lines (and construction activities in general) can stimulate adverse emotional responses in some individuals, particularly among persons who live close to the transmission route. Such responses can stem from annoyance at the more tangible effects described previously, such as noise or radio or television interference. Transmission lines and other rights-of-way can also lead to unauthorized use, particularly by motorcyclists or other off-road vehicle users, which often is viewed as a problem by residents along or near the right-of-way. Despite installation of gates and other restrictive measures, such unauthorized use cannot be eliminated. Other causes of adverse social reaction can be concern over perceived human health risks, or simply resentment of intrusion (often visual) upon established routine and conditions. Regardless of cause, these reactions are unavoidable if a transmission line is built.

ALTERNATIVES AND OPTIONS

The potential social impacts of the project should be considered essentially equal for the draft preferred alternative and alternatives 2 and 3. Social effects are highly subjective, and difficult to measure on a standard basis. Accordingly, the count of residences which would be within 1,000 feet of the right-of-way appears to be the best substitute measure of the extent of social impacts, as in most cases this represents the population which would be most directly affected; this particularly applies to noise, electric and magnetic effects, and the "other social effects" described above.

The preferred, parallel and double circuit configurations may involve some differences in the level of effects based upon the number of transmission lines which would exist in a given location, but these differences would not be substantial. For example, the operating noise level of the parallel alternative would not be the sum of the noise from the 500 kV line and the existing 230 kV line(s); rather, when unequal sound levels are combined the resulting sound is 1 dB above the higher sound level (Douglas County Planning Department 1980). Similarly, the voltages of multiple transmission lines within a single corridor are not additive in terms of electric field strength; the maximum field strength under multiple lines would not be significantly greater than the field under the highest voltage line (USDI BPA 1977a).

Due to these considerations, neither existing corridors nor new alignments are clearly preferrable in terms of noise and electric and magnetic field effects. The parallel alternative (Alternative 2) would probably entail slightly more risk of line failure or inadvertent contact, as this plan would involve the greatest number of lines and the greatest areal extent of transmission facilities. A double circuit line would probably be considered more of an obstacle to airplanes than a single circuit line, due to the greater height of the double circuit towers. With the exception of the possible new corridor segments, all of the construction alternatives would slightly increase the level of safety risks present, but would not introduce risks which were not previously in existence.

A description of the number and locations of residences within 1,000 feet of the proposed right-of-way was included previously in the land use section and in Tables 1-4, 1-5, and 1-6. Briefly, between 330 and 380 houses and 230 to 290 apartments appear to be located within 1,000 feet of the route of the draft preferred alternative along the entire corridor. Aside from minor differences due to varying placement of the centerline along most of the parallel alternative, the number of residences within the 1,000 foot zone would be the same for the draft preferred alternative and Alternatives 2 and 3. The new preferred alternative would be within 1,000 feet of a total of 220 to 250 houses, but no apartments. Among the options, substantive differences would apply to Options B, C, and D and the routing options for the Medford area. Development of Option B, the new corridor option in the Eugene area, would lead to a reduction of from about 290 to 360 units within the 1,000-foot zone as compared to the draft preferred alternative.

Selection of Option C (a portion of the new preferred alternative) would completely avoid the large concentration of residential development in the Eugene area. The draft preferred alternative above Dixonville would pass near approximately 20 more residences than Option D, which would follow a new route in a more sparsely settled valley.

In the Medford Basin, the draft preferred alternative would be within 1,000 feet of approximately 20 to 24 residences, compared to 100 to 120 for Option H or L and 130 to 160 for Option I or M. The net differences in favor of the draft preferred alternative would probably range around 90 units compared to Option H or L and 125 units versus Option I or M. The judgment as to the overall significance of these differences depends upon the perspective and values of the individual. Intuitively, the incremental social effects would be greater on an individual basis for residents along a new corridor, as opposed to an existing corridor. In other words, each individual along the draft preferred alternative or the new corridor section of Option H might be expected to be affected to a greater degree than a corresponding individual who already lives along a transmission corridor. However, adopting this evaluation posture would require some decision maker to perform the nearly impossible task of calculating such differences in degree of effect, or to weight one group of residents more importantly than another. Alternatively, an equity-based posture could be adopted, in which case all residents who would be affected would be considered equally, regardless of degree. No preference is clearly apparent if the focus is on incremental social effects, while the social effects of the draft preferred alternative route would be considered least if the latter approach is taken.

The no action alternative would clearly avoid the adverse social consequences of constructing a 500 kV line but could give rise to other adverse social effects, depending upon the unpredictable performance of the transmission system under the no action alternative. If the anticipated loads and/or outage conditions failed to materialize, the transmission system would perform adequately and adverse social effects would not occur. Various intermediate levels of system failure could occur, probably including occasional dimming or flickering of lights, restriction of decorative lighting or other non-essential electric uses, and localized short-term outages. The prevailing social response to these types of events would probably be grudging acceptance or minor annoyance at inconvenience; telephone, written and verbal complaints to Pacific offices and employees would probably increase significantly.

Serious electrical system problems such as extensive outages, curtailment of power to large users, and/or a moratorium on new electric hook-ups could lead to the adverse economic consequences described in the previous section. Assuming the worst case electrical scenario occurred and led to economic stagnation in the service area, social reaction could take several forms. In time, the social and psychological problems associated with unemployment and declining real income could become significant. Alternatively, economic stagnation

could trigger an outflow of population from the service area, perhaps leading to a lower socioeconomic equilibrium level and eventual improvement in the electrical situation. In reality, however, it is quite likely that a serious level of electrical system problems would trigger a vocal regional debate, with the end result being an effort to restore electrical service to an acceptable level.

CHAPTER 4

CONSULTATION AND COORDINATION

CONSULTATION AND COORDINATION

Four organizations, the Bureau of Land Management, Pacific Power and Light Company, Bonneville Power Administration, and the Oregon Department of Energy signed a Memorandum of Understanding prepared in early 1981 regarding their responsibilities on the Eugene-Medford 500 kV Transmission Line project. These four organizations, identified as "cooperating parties," have conducted extensive efforts to involve agencies, organizations, and the public in efforts related to this project. In addition, Envirosphere Company, the independent third-party preparer of the EIS, consulted with federal, Oregon state, and local agencies and other organizations and individuals regarding this project. These consultation and coordination activities are summarized in Table 4-1.

Copies of the DEIS were sent to numerous individuals involved in the public participation process. The federal, Oregon state, and local government agencies to which copies of the statement were sent are listed in Table 4-2. Copies of the document were also placed in libraries throughout the Eugene-Medford project area. Copies of the Final EIS will be sent to those who received draft copies, as well as those individuals who registered at the public hearings.

FEDERAL PERMITS REQUIRED

Two federal permits are required for this project. The agencies and types of permits are listed below.

U.S. Department of the Interior, Bureau of Land Management: Grant of Right-of-Way.

U.S. Department of Defense, Army Corps of Engineers: Section 404 Permit.

TABLE 4-1
CONSULTATION AND COORDINATION ACTIVITIES

	1981				1982		
	January — March	April — June	July— August	September— December	January— March	April— June	July— September
Notice of ESFC and BLM Meetings	1,4						
Scoping Meeting and EFSC Hearing							
Eugene	1,2,3,4						
Roseburg	1,2,3,4						
Medford	1,2,3,4						
Contact Federal, State and Local Agencies	1,2,3,4	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5	1,2,3,4,5
Routing Workshop and Public Notice							
Eugene			1,2,3,4,5				
Medford			1,2,3,4,5				
File Site Certificate Application and Distribute Interested Parties				2,4			
EFSC Hearings							
Eugene					1,2,3,4,5		
Medford		2		2	1,2,3,4	1,2,4,5	1,2,4,5
Meeting with Jackson County Commissioners					1,2,4,5		
Draft EIS Issued							1
Draft EIS and EFSC Limited Appearance Meetings							
Eugene						1,2,3,4,5	
Roseburg						1,2,3,4,5	
Medford						1,2,3,4,5	
Comments Received							1,2,3,4,5
EFSC Decision							**2,4**

1. Bureau of Land Management
2. Pacific Power and Light Company
3. Bonneville Power Administration
4. Oregon Department of Energy
5. Envirosphere Company

TABLE 4-2

AGENCIES TO WHICH COPIES OF THE DEIS WERE SENT

FEDERAL AGENCIES

Advisory Council on Historic Preservation
U.S. Department of Agriculture
  Soil Conservation Service
U.S. Department of Commerce
  National Marine Fisheries Service
U.S. Department of Defense, Army Corps of Engineers
U.S. Environmental Protection Agency
  Region X
U.S. Department of Housing and Urban Development
U.S. Department of the Interior
  Office of Environmental Project Review
  Fish and Wildlife Service
  Bureau of Mines
  National Park Service
U.S. Department of Transportation
  Federal Aviation Administration
  Federal Highway Administration

OREGON STATE AGENCIES

Department of Agriculture
Department of Economic Development
Department of Environmental Quality
Department of Fish and Wildlife
Department of Geology and Mineral Industries
Department of Human Resources
Department of Land Conservation and Development
Department of Revenue
Department of Transportation
Forestry Department
Parks and Recreation Division
Public Utility Commissioner
State Historic Preservation Office

CALIFORNIA STATE AGENCIES

Public Utilities Commission

LOCAL GOVERNMENT AGENCIES

City of Eugene
Public Works Department, Building Division
  Parks and Recreation Department
Douglas County
  Board of Commissioners
  Parks and Recreation Department
  Planning Department

TABLE 4-2 (Cont'd)

LOCAL GOVERNMENT AGENCIES (Cont'd)

Jackson County
- Board of Commissioners
- Parks and Recreation Department
- Planning and Development Department

Lane County
- Board of Commissioners
- Parks and Recreation Department
- Planning Department
- Public Works Department

COMMENTS AND RESPONSES

A total of 55 letters were received in response to the Draft Environmental Impact Statement (DEIS), and 68 letters in one package (from the Medford area) were received prior to the release of the DEIS. Substantive comments were identified in some of these letters. Substantive comments from the 68 letters received before the DEIS was released were not identified, although many of these commenters also testified at the public hearing in Medford. Testimony given at the public hearings in Medford, Roseburg, and Eugene on June 15, 16, and 17, 1982, respectively, was also reviewed and substantive comments were identified. These substantive testimony comments, if they differed from the written comments, were assigned index numbers. The lists of indexed comments are provided in Table 4-3, on pages 4-18 to 4-22.

All substantive written and verbal comments were reviewed and considered in developing this Final EIS. Comments which presented new data, questioned facts and/or analyses, or raised questions or issues bearing directly upon the environmental effects of the proposed action were used in revising the text or are responded to separately in the Final EIS.

Copies of all written comments not published in this EIS and the hearings transcripts are available for public review at the Bureau of Land Management Oregon State office, 825 N.E. Multnomah Street, Portland, Oregon; the Medford District Office (3040 Biddle Road, Medford, Oregon); the Roseburg District Office (777 N.W. Garden Valley Boulevard, Roseburg, Oregon); and the Eugene District Office (1255 Pearl St., Eugene, Oregon).

COMMON ISSUES

Many written and verbal comments centered upon key issues and concerns, such as electric field effects, houses along the route, and the need for the transmission line. Because there was duplication of comments, master responses were prepared for six common issues that were identified from the comments. The six common issues and their responses are presented below. All of the subsequent individual written comments that reflect one of these common issues are referenced to the appropriate common response, to avoid unnecessary repetition of responses.

Common Issue No. 1: Several comments disputed information on house counts along various sections of the alternatives and options under consideration. These comments questioned the number of houses present along the route and the methodology used to determine the number of residences.

Response: Information on house counts in the Final EIS corrects errors in the Draft EIS (see Tables 1-4, 1-5, and 1-6). These final house counts along all segments of the transmission line were estimated from color air photographs and checked in the field by driving public roads that intersect the proposed lines and their options. The estimated totals for each segment and the general degree of exposure of the houses are discussed in the Technical Investigations on pages 6-15 to

6-69. These figures are presented as ranges rather than a single figure, unless it was possible to determine the number of houses exactly. The latter was usually not possible because of forest cover in the area through which the line passes. The house counts are therefore presented as estimated ranges. This is an adequate measure for the purpose for which the house counts are used. Because many houses within 1,000 feet of the line may receive no impact while others may receive a considerable visual or land-use impact, the use of estimated numbers of houses is a good method for comparing potential impacts. The counts are also used as a surrogate measure for perceived impacts, rather than an absolute measure of any direct impacts of the transmission line, whether visual or land use.

Common Issue No. 2: Commenters in the Eugene area questioned the need for a 500 kV transmission line connecting Lane and Alvey Substations in order to establish a 500 kV transmission loop around Eugene. These comments centered on the forecast of the need for this loop as well as the timing of such a line, and questioned the wisdom of constructing a line in the 1980s to serve a potential need which would not occur until the mid-1990s.

Response: BPA acknowledges that load growth in western Oregon and throughout the Pacific Northwest has decelerated in the recent past, causing load forecasts to be revised downward to growth rate levels that are very low by historical standards. The most recent area forecast (the BPA Fiscal Year 1984 Load Forecast) now indicates that the projected need for a 500 kV transmission loop serving Eugene and the southern Willamette Valley has been deferred from the mid-1990s to the late 1990s. Given this deferral, BPA concurs with the Oregon EFSC recommendation, and prefers to construct the northern 500 kV terminal link from Spencer Switching Station to Alvey Substation at this time. BPA continues to recognize a future need for a 500 kV connection from Spencer to Lane Substation, however, and will be working with Eugene and Lane County planning officials to identify acceptable alternatives for this connection. This conclusion is based on a number of specific factors relating to the comments on the initial proposed action, including load growth in general, the applicability of various forecasts to the need issue, the potential impact of alternate transmission technologies, timing and related costs differentials, and the EFSC definition of need.

The transmission system in the Eugene area serves to transfer power to loads on the Oregon coast and to Pacific's service area, in addition to serving local loads in and around Eugene. Growth from these three general load sources will determine the need for transmission reinforcement in the Eugene area, through developing a 500 kV loop, and the necessary timing of this reinforcement. Load growth within the region as a whole is only indirectly relevant to the need for reinforcement in the Eugene area.

The DEIS identified a mid-1990s need for a 500 kV loop based on projected peak load growth in the Eugene area from 1000 MW to 1500 MW,

corresponding to an annual growth rate between 3 percent and 4 percent. The BPA Fiscal Year (FY) 1984 Load Forecast, which projects loads by utility and delivery point for transmission planning purposes, indicates composite peak load growth through 1993 among Eugene-area BPA customers of about 2.7 percent per year. This reduced growth rate reflects increased conservation and decreased economic growth, and is responsible for deferring the need for reinforcement until the late 1990s. Eugene Water and Electric Board (EWEB) peak loads are projected to grow at an annual rate of just above 3 percent, and Lane County Electric Cooperative loads at 3.9 percent. As stated in the DEIS, load growth in the Pacific service area is expected to occur at a slightly higher rate.

Most of the commenters on the need question stated that the load growth projections included in the DEIS were invalidated by BPA's own recent regional forecast and by the Pacific Northwest Utilties Conference Committee's latest regional forecast. The BPA regional forecast does indeed project a base case load growth rate of 1.6 percent annually from 1980 to 2000, but this forecast does not have a direct bearing upon the need for the proposed action. The regional forecast provides an expected average growth rate for the entire Pacific Northwest, but most definitely is not a uniform growth rate for all areas within the region. It is not correct to assume that loads in the Eugene area or any other local area will grow at the regional forecast rate; separate forecasts for each area must be developed in order to plan for transmission facilities (see also response to Common Issue No. 4).

The 1.6 percent regional forecast rate is also inapplicable to the current need question because it is a forecast of average energy use, rather than peak energy use. BPA's system planners must work on the basis of peak energy use, the maximum power demands occurring at certain times of the day and on the coldest and warmest days of the year. Peak demand is less affected by conservation than is average energy use (e.g., electric space heating units will still operate on cold days, although they may operate for fewer hours due to additional insulation or lowered thermostats) and generally increased at a faster rate. This relationship is partially responsible for and helps to explain the disparity between the publicized regional forecast rate and the load forecasts supporting the future need for Eugene-area reinforcement. It should be noted that the widely-cited regional forecast includes a peak load forecast rate that is 25 percent higher than the energy forecast rate of 1.6 percent.

Some commenters referred to transmission technology, and raised the possibility that technological change could provide additional reinforcement alternatives before the 500 kV loop would be needed in the 1990s. The possibility cannot be discounted, and BPA will continue to evaluate such developments prior to completing the loop in the future. Underground transmission is the only technological alternative to overhead transmission currently on the horizon, however, and major cost-saving advances in undergrounding would have to be made before this would be feasible.

The final aspect of the need question involves the different concepts of facility need employed by EFSC and BPA. The most pertinent feature of the EFSC need standard (OAR 345-80-043) is that the proposed transission line will be needed to carry peak loads within five years of its completion. The Lane-Alvey connection would not meet this standard, as loads would not require reinforcement by 1991. The EFSC standard is designed to provide maximum protection for rate payers against the eventuality of overbuilding and is clearly targeted to individual facilities. BPA shares these goals, but due to its role as the federal power marketing agent in the region, it necesarily places greater emphasis on maximum reliabiltiy of the entire region-wide transmission system and lesser emphasis on strictly local concerns. Having identified a future need for a 500 kV loop, the need for a terminal link from Spencer to either Alvey or Lane provided the impetus for constructing the most difficult link (Lane-Spencer) first. Though creating impacts to existing resources and current land uses, it was recognized that, based on anticipated development, these impacts would only be greater and more controversial if this construction were deferred to the future. Given the current opposition to the Lane-Spencer proposal, the future completion of the 500 kV loop will require cooperation with local planning officials and a thorough analysis of acceptable alternatives.

Common Issue No. 3: Many of the comment letters and speakers at all of the EIS hearings questioned the effect of the proposed transmission line on property values. These comments primarily reflected the concern that the proposed project would lower property values along and adjacent to the line. Some commenters also stated that the EIS discussion of property values was contradictory, because it described a court decision in which substantial monetary damages were awarded, yet did not ascribe such damage to all properties along the proposed line.

Response: The text of the EIS has been revised to address comments regarding property values (see FEIS pages 3-69 to 3-72). In analyzing these comments, it was determined that they addressed five specific sub-issues. These issues are identified below, followed by a brief discussion of how the revised text responds to these concerns.

Sub-issue A: The DEIS does not acknowledge that the value of properties near the transmission line will be reduced.

Response: The DEIS stated that there may be a minor effect on property values in and adjacent to the corridor, and that it was impossible to predict land value effects. The text has been revised in the Final EIS, to expand upon these aspects of the property value issue. Specifically, more attention is given to research and professional opinion on property value effects, and the subject of predicting any possible value changes is discussed in more detail.

Sub-issue B: The research conducted to date on the property value effects of transmission lines was all conducted in the eastern and southwestern U.S. or in Canada, and therefore is not applicable to the Eugene area.

Response: The EIS text has been modified to describe the geographic coverage of the research. The original base of information has been suplemented by insights gained through personal contacts with experienced appraisers. While studies of property in Oregon or the Pacific Northwest could not be found, conclusive studies of other areas would have some general application; market responses will not be identical in all locations, but all local real estate markets respond to the same basic market forces.

Sub-issue C: The Mountain West Research report is used to conclude that transmission lines do not significantly affect property values, yet the most authoritative study reviewed by Mountain West (Colwell and Foley 1979) shows exactly the opposite result.

Response: The EIS text material concerning the existing research has been clarified and expanded to resolve an apparent misunderstanding. The DEIS only stated that the research was inconclusive, but "tends to support the belief that off-corridor lands are not significantly or consistently diminished in value." This was not a statement that significant effects do not occur, but simply an indication that there is not a body of research that demonstrates that transmission lines create uniform, predictable, significant effects.

Sub-issue D: The DEIS contains no specific information regarding property values or affected properties in the Eugene area.

Response: Commentors seemed to feel that the EIS should have presented data on assessed property values on a geographic basis, and should have used avoidance of high-value areas as a route selection and evaluation criteria. As the discussion in the body of the EIS concerning the proposed project's effect on property values suggests, the effect of a line on property values is speculative and is difficult to assess. If property vaues were included in the text, readers would be presented information which would imply greater impact in more affluent areas. Presenting this type of information, without proper analytical support, is inappropriate in an EIS. This approach would also ignore the site-specific relationships between a particular property and a transmission line, which are the critical factors in determining whether any effect would occur.

Sub-issue E: The construction cost estimates for the routing options do not include the cost of compensation to property owners, which would be abnormally high due to the high property values in the areas in question.

Response: The comment appears to presume that either the cost figures completely ignore right-of-way acquisition costs, or that the cost estimates are based on standard, composite, per-mile total cost figures. The cost estimates included in the EIS were developed by BPA and Pacific engineers on the basis of expected materials, labor,

right-of-way acqusition, and other costs. The total costs for the various alternatives and options are not based on standard, per-mile costs, but reflect estimates adjusted for terrain, location, number of angle points, and similar factors.

Common Issue No. 4: Commenters expressed doubt whether a tranmission line to southern Oregon was needed and questioned the forecast upon which the project need was based. Reference was often made to the recently released BPA Regional Forecast.

Response: The suggestion has been made that, in light of the relatively lower projected annual average percentage growth rates in both the PNUCC 1982 Northwest Regional/Sum-of-Utilities Forecast and the BPA Regional forecast, the Pacific load forecast used in its justification of need for the proposed facilities needs to be revised. Substantial shortcomings in these regional forecasts should be noted as they apply to this issue. First, both the PNUCC and BPA projections are a forecast for the entire region, as defined by the Pacific Northwest Regional Power Act, which is dominated by various metropolitan areas. These urban areas are not typical of Pacific Power's service territory. The southern Oregon portion of Pacific's Southwest Division represents only about three percent of the total regional load. The area to be served by the proposed facilities also includes the northern California portion of Pacific's service territory, which is not forecast in any fashion whatsoever by either of the regional forecasts.

Another shortcoming is that Pacific's forecast was prepared for different purposes. Both the regional forecasts were designed primarily to provide insights into long term (generally ten years or more into the future) generation requirements within the region as a whole. The forecast entered into this proceeding by Pacific was produced for a different use entirely. It was developed to estimate the need for a single future major transmission facility to serve a specific substate area within five years. As a result of the different uses of the forecasts, Pacific and PNUCC/BPA employed different techniques and methodologies in generating their respective forecasts. The regional forecasts do not attempt specifically to model the short term effects of business cycle fluctuations with their corresponding impact on electricity demand. For example, the economic inputs used in the regional forecasts have been prepared without any specific consideration of business cycle impacts on the level of economic activity in a given forecast year. In general, the models used to produce the regional forecasts are structured in such a manner as to be oriented primarily toward forecasting energy demand on a long term or "normalized" basis.

For the above reasons any direct comparisons between regional load forecasts and the substate forecast used by Pacific in this process are irrelevant. Further, as Pacific has maintained throughout the EIS and state siting process, the proposed in-service dates supported by its load forecast represent the earliest dates for which it is reasonably

expected that the proposed facilities will be needed. If load demand does not occur as forecast, the construction schedule for the facilities will certainly be altered to reflect the change in expected loads. There is no incentive for Pacific to invest in facilities before they are expected to be needed. It is still Pacific's opinion that the proposed facilities will be needed within the time frame provided for in the site certification, which was granted in August 1982 by the State of Oregon through its Energy Facility Siting Council.

Common Issue No. 5: A number of commenters were concerned about the potential electrical and electromagnetic effects of the proposed transmission line, including noise, radio and television interference, shock hazard, risk of health effects, and social or psychological responses to these factors. Many commenters simply identified or expressed opposition to effects acknowledged in the DEIS. Two comments appeared to indicate that corona noise and communications interference from the proposed line could not be mitigated. Some commenters stated that potential health effects were not discussed adequately in the DEIS, or that such hazards currently existed or would be shown to exist in the future.

Response: The response to this common issue has been divided into several areas, which include noise, radio and television interference, health effects, and social and psychological responses, to more fully respond to Common Issue No. 5.

Sub-Issue A: The EIS text has been expanded to provide a more precise comparison of expected operational noise levels with existing background noise (see FEIS pages 3-81 and 3-82). The relative noise impacts of the alternatives and options were adequately described on pages 3-83 and 3-84 of the DEIS; because the double-circuit line would only be marginally noisier than the proposed single-circuit line, the substantive differences in impacts between alternatives and options relate to residents and other users along the routes. Noise from transmission lines cannot be prevented, but utilities have repeatedly demonstrated that 500 kV lines can be built to the rather stringent noise standards described on page 3-80 of the DEIS.

It must be acknowledged that future residences will likely be built near the proposed line subsequent to its construction, and that these residents may later complain about noise from the line. BPA and Pacific will cooperate with the Oregon Department of Environmental Quality in investigating and resolving such complaints, but other strategies or mechanisms for resolving such conflicts are not apparent. The line will be built and maintained to meet the current standard, but subsequent line modification or off-site mitigation would not appear to be possible or practical.

Sub -Issue B: Radio and television interference is an unavoidable but limited consequence of EHV transmission lines. As described in the DEIS, interference can occur in close proximity to a line (within about 500 to 600 feet; USDI BPA 1977a, 1982b) in remote areas where

transmitter signals are weak. Reception in such cases is and must be restored, typically through such measures as relocating an antenna, and adequate technology for such restoration is commonly available.

Sub-Issue C: Both short-term and long-term potential health effects of tranmission lines, including latent or subtle effects, are treated adequately in the DEIS. The risk of shocks from induced current or inadvertent conductor contact is acknowledged and discussed, as are the measures that are taken to minimize such risks. The discussion of potential long-term effects from exposure to electric and magnetic fields is brief because a longer presentation is unnecessary and would not resolve the debate over whether such effects actually occur. The comprehensive reviews that are incorporated by reference are easily available, provide ample background information for agencies and the public, and represent the appropriate forum for presenting all of the evidence on this subject.

The salient fact from this body of research that can be applied to the EIS is that health hazards from electric and magnetic fields have not been demonstrated. A scientific negative (the lack of a cause-and-effect relationship) cannot be proven because the number of possible tests of effects is infinite (ODOE 1980). Conversely, a credible and acceptable test showing health effects from transmission lines must have confirmation by independent researchers conducting similar or duplicate tests. The research in this field includes both epidemiological studies (surveys of the health of subjects, such as transmission line or substation workers) and laboratory experiments that claim effects from electric or magnetic fields, but these effects have generally not been confirmed or have been negated by replicate studies (Carstensen 1981). Confirmed effects involved either much stronger fields than exist under a 500-kV line, such as aversion of rats for an electric field of 75 kV/m, or perception of hair movement or induced-current shocks in fields of the appropriate strength. Conversely, effects such as decreased growth in chickens and impaired reproductive ability in rats have been negated by independent attempts at confirmation. Possible effects on honeybees or other insects have been demonstrated, but these effects have not been extrapolated to humans (ODOE 1980). Given these research results, a conclusion in the EIS that the electric or magnetic field of the proposed line would likely represent a risk to human health could not be based on valid scientific evidence.

In recognition of the ongoing debate over electrical and magnetic effects, the DEIS instead focuses on other means of accounting for these concerns. Because the debate over these effects cannot be resolved in the EIS, factors such as field strengths and standards are particularly important. The EFSC standards described in the EIS are designed to eliminate safety hazards from shocks, and are not based on health concerns related to electric field exposure. Standards or regulations on field exposure do not exist in the United States, but have been established for substation workers in the Soviet Union (ODOE 1980). The Soviet standards permit a duration of three hours per

24-hour period within a field of 10 kV/m and allow unlimited exposure to electric fields of 5 kV/m. In comparison, the electric field from the proposed 500 kV line would typically be 3 kV/m at 75 feet from the centerline (slightly within the edge of the right-of-way), and would approach zero at 120 feet from the centerline (Ferris 1983). Further, buildings constitute an effective shield to electric fields. Human exposure to the proposed line's electric field would therefore be limited to outdoor areas within or immediately adjacent to the right-of-way, and in most cases would be infrequent and of short duration.

As stated in the DEIS, the magnetic field under the proposed transmission line would be a maximum of about 0.5 gauss, about the strength of the earth's magnetic field. The magnetic field strengths at which biological effects can occur are much higher than these low levels. Consequently, the recommended U.S. safety standard for exposure to magnetic fields for long periods is 200 gauss (USDI BPA 1977a).

Sub-Issue D: Some comments on the DEIS concerned the treatment of social and psychological reactions to construction of the proposed line by nearby residents. The DEIS openly acknowledges that some local residents would have very negative reactions to the line, and identifies the general causes of such reactions. Adverse reactions are accounted for and treated as legitimate social concerns in the text and through the inventory of residences within 1,000 feet of the route alternatives and options. This inventory provides a broad but appropriate substitute measure of the population most likely affected by the proposed line. The house count is a very conservative measure in some respects; corona noise and the electric field, for example, would extend much less than 1000 feet from the centerline.

The DEIS incorporates this measure directly into the overall comparison of route alternatives and options, providing a direct assessment of relative social effects along with other environmental effects. This yields an indication of the route configurations that might minimize adverse social responses, although the DEIS is correct in the position that no alternative or option could completely avoid such responses.

Common Issue No. 6: Commenters expressed concern that impacts on future residences were not addressed in the Draft EIS. Comments typically stated that the density of residential units near the proposed project would increase considerably in the future and that therefore more individuals would be impacted. There was concern that this consideration was not factored into the DEIS.

Response: As discussed in Common Issue No. 1, house counts are not intended as the measure of any direct impact, but as a surrogate measure for perceived impact. It is quite possible that some of the houses within 1,000 feet of the proposed line would not be affected by the line while others could receive direct land use impacts as well as indirect visual impacts. For these reasons, relative numbers of houses

along line segments are an adequate means of comparing impacts. For this purpose, the counts of existing houses are more accurate and significant than projections of the possible number of houses that might exist in particular areas at some future, undetermined time. Those projections would be speculative. Moreover, projections of numbers of future residences would only reinforce the counts of existing residences, since it is Oregon land-use policy to concentrate future housing in areas presently used for housing. Thus, the accuracy of the environmental assessment would not be furthered by presenting potential numbers of future houses in addition to the existing house counts.

RESPONSES TO WRITTEN COMMENTS

Letters containing comments on the DEIS are numbered using the index presented in Table 4-3. Those portions of letters which include substantive comments have been reproduced, along with a response on the following pages.

TABLE 4-3

COMMENTS RECEIVED ON THE DRAFT EIS

Letter No.	Agency, Organization or Individual
L-1	USDA, Soil Conservation Service, Portland, OR
L-2	Maurice M. Watts, Grants Pass, OR
L-3	Department of the Army, Portland District Corps of Engineers
L-4	Paul Robitschek, Eugene, OR
L-5	Elsie B. Peck, Eugene, OR (2)
L-6	Marlene Meatte (Mrs. Joe R.) Eugene, OR
L-7	Mack, Thomas J. and Constance (Mailgram to Jack Thomas), Tarzana, CA
L-8	Hill, Otis and Roberta, Eagle Point, OR
L-9	Mace, Robert and Jack (statement submitted at Medford hearing)
L-10	Thomas, Robbie, Eagle Point, OR
L-11	Thomas, Jack, Eagle Point, OR (letter to EFSC)
L-12	City of Eugene Comments (Mayor's Office)
L-13	Lane County (statement submitted at Eugene hearing by Commissioner Jerry Rust)
L-14	Struble, Elsa, Eugene, OR
L-15	The League of Women Voters of Central Lane County, Eugene, OR
L-16	City of Eugene (Timothy J. Sercombe, Attorney for City of Eugene)
L-17	Peck, Elsie B., Eugene, OR
L-18	Warren, Charles E. (Submitted at hearing and letter followed), Eugene, OR
L-19	Sam and Edna Mason (on behalf of Jim and Barbara Johnson)
L-20	Mason, SS
L-21	Jellum, Helen A.
L-22	Jellum, Walter A.
L-23	Jellum, Don, Gold Hill, OR
L-24	Sanner, Beatrice E., Gold Hill, OR
L-25	Schmitz, Peter D. (Afseth, Jacobs and Schmitz, Architects, AIA), Medford, OR

Letter No.	Agency, Organization or Individual
L-26	Robitschek, Paul, Eugene, OR
L-27	A-95 Clearinghouse, State of Oregon (Office of State Forester, Department of Environmental Quality, Department of Fish and Wildlife, Department of Land Conservation and Development)
L-28	Hess, John R.
L-29	Wilder, Hannah L.
L-30	Wood, Larry A.
L-31	Pearsall, Elizabeth H.
L-32	Pearsall, David R., Eugene, OR
L-33	Severta Shipley (Metal Masters Inc., sent cc to Mr. Sage and Deason), Medford, OR
L-34	Heineck, Edward, Donna and Jackie
L-35	Cowdrey, Carl W. and Margie
L-36	Bos, Josephine, Gold Hill, OR
L-37	Thums, Mr. and Mrs. V.J.
L-38	Lane Council of Governments (Regional Clearinghouse)
L-39	Jellum, Don, Gold Hill, OR (Letter plus signed petition)
L-40	USDI, National Park Service, Seattle, WA
L-41	Bennett, Robert R., Eugene, OR
L-42	Wines, M.C., Eugene, OR
L-43	USDI, Fish and Wildlife Service, Olympia, WA
L-44	Timber and Wood Products Group (Southern Oregon Region), Medford, OR
L-45	Michael Strooband, Eugene, OR
L-46	Werschkul, David F., Ph.d (Kalmiopsis Field Station; Biologist for Yankee Creek Ranch)
L-47	Thomas, Jack, Eagle Point, OR

Letters 48-115, identified *, were contained in submission from J. Thomas. All were written prior to release of the DEIS.

L-48*	Rogue River Guides Assn.
L-49*	Shady Cove Business and Professional Association

Letter No.	Agency, Organization or Individual
L-50*	Wanda Boughton
L-51*	B.L. Schoonover
L-52*	R. Georgianna
L-53*	Bob Johnson (Johnson Custom Printing)
L-54*	Chuck and Lorraine Kimmel
L-55*	Jack E. McCrory
L-56*	Teresa and Mark Wiest
L-57*	Paul and Ruth E. Robinson
L-58*	Mr. and Mrs. C.E. Seybolt and Mr. and Mrs. L.G. Partt
L-59*	N. Webb, Carl Webb
L-60*	Jack and Sandra Krueger
L-61*	Steve and Linda Millard
L-62*	Rod Graham
L-63*	C. Blaine Moreley
L-64*	Robbie Thomas
L-65*	Jack E. Farmer
L-66*	James and Leora Spear
L-67*	Gene Weitman (Mr. and Mrs.)
L-68*	Dwayne Hawkins
L-69*	Art Schon
L-70*	Robert M. Storey
L-71*	Rex B. Byrd
L-72*	Gregg Adams
L-73*	McCauley's (Wonder Star Ranch) (8 signatures)
L-74*	David C. Perry
L-75*	Sheila M. Perry
L-76*	Edna M. Ehrheart
L-77*	Mr. and Mrs. Ewing
L-78*	Kenneth E. Weitman, Kathryn N. Weitman
L-79*	D.C. Seyboldt
L-80*	Mr. and Mrs. Ed. Russell
L-81*	LaRae Jensen
L-82*	Lee H. Perry

Letter No.	Agency, Organization or Individual
L-83*	Charles and Lorraine Kimmel
L-84*	Esther Spencer
L-85*	Edmond and Henrietta Berry
L-86*	Ron Crawford
L-87*	Kathy Johnson
L-88*	Louise Horst
L-89*	Katherine L. Benbrooks and Thomas E. Benbrooks
L-90*	Lester G. Garrman
L-91*	Ronald D. Watson
L-92*	Nathan Perry
L-93*	J. Watson
L-94*	Gerald Hansen
L-95*	Margaret J. Hansen
L-96*	Harold J. Dress
L-97*	Larry and Betty Sweem
L-98*	John and Frances Pope
L-99*	Arlene aand R. Jay Hester
L-100*	Richart and Catherine Walch
L-101*	Bob Bellamy
L-102*	Clayton L. Vines
L-103*	James Chappelear
L-104*	Lauren L and Georgia R. Dover
L-105*	Norma Grier (Southern OR Northwest Coalition for Alternative to Pesticides)
L-106*	Pearl J. Bartling
L-107*	R.A. Murphy (Murphy Custom Building)
L-108*	Robert L. Edwards
L-109*	Joan Ragsdale
L-110*	Grant Webb
L-111*	Duane S. Baumgartner
L-112*	Norman and Caroline Barrett
L-113*	Dave and Carolyn Boerner
L-114*	Clinton and Ernestyn Charley
L-115*	Hans Rinderknecht

L-116	Chris Attneave, Eugene, OR
L-117	Evelyn Nelson
L-118	John Haugh
L-119	Rogue Valley Council of Governments
L-120	U.S. Environmental Protection Agency, Region X, Seattle, WA
L-121	Larry R. and Cynthia L. Jones, Eugene, OR
L-122	Hutchinson, Harrell, Cox, Teising & Anderson, P.C. (Anderson, DuPriest, Coons), Eugene, OR
L-123	City of Eugene (Johnson, Harrang & Swanson, City Attorneys)

Testimony Comment No.	
2-8	Cynthia Wooten, Eugene, OR (Eugene City Council Member)
5-7	James Coons, Eugene, OR (Attorney with firm of Hutchinson, Harrell, Cox & Teising)
9-1,9-2	Raymond Lowe, Eugene, OR
25-1	Tom Wallace, Rogue River, OR
27-1	Lester G. Garman, Eagle Point, OR
29-1,29-3	Robbie Thomas, Eagle Point, OR

DEPARTMENT OF THE ARMY
PORTLAND DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2946
PORTLAND, OREGON 97208

3

NPPEN-PL-NR

2 June 1982

Mr. William G. Leavell
State Director
Bureau of Land Management
P. O. Box 2965
Portland, OR 97208

Dear Mr. Leavell:

We have reviewed your Draft Environmental Impact Statement for the proposed Eugene-Medford 500 kV Transmission Line with respect to the Corps' functional responsibilities for flood control, hydropower, navigation, and permits. We suggest that you apply for a Department of the Army permit for the Rogue River crossing as soon as an alternative is selected. Other activities which would require placement of fill material in waters or wetlands may also require permits. We suggest that you contact our Regulatory Functions Branch, (503) 221-6995, for determinations as to whether individual permits are required in these cases. 3-1

Thank you for the opportunity to review this document.

Sincerely,

PATRICK J. LEOUGH
Chief, Planning Branch

RESPONSES TO WRITTEN COMMENTS

Letters containing comments on the DEIS are numbered using the index in Table 4-3. Those portions of letters which include substantive comments have been reproduced, along with a response on the following pages.

Response to comments in Letter 3:

3-1 Permit applications will be prepared during the design phase of the project.

PAUL ROBITSCHEK
32945 DILLARD ROAD
EUGENE, OREGON 97405

4

May 28, 1982

Bureau of Land Management
Planning and Environmental
Coordination Staff (935)
P.O. Box 2965
Portland, OR 97208

Gentlemen:

This is to advise you of: a) the inaccuracy of a statement in the Environmental Impact Statement, Technical Investigations, Eugene-Medford 500 kV Transmission Line of May 1982, and b) my request for consideration of my specific situation.

The statement occurs on page 6-26. "Visibility of Line from Houses: where the line crosses Dillard Road there is a farm located at the edge of the 1000 foot zone. This complex, however, is located downhill and is therefore only minimally affected visually."

Please be advised that my house at 32945 Dillard Road is located between the line and the said farm, about 300 feet east of the line, construction of which was commenced in the Fall of 1978, and completed in the Spring of 1979. Hence, the survey is totally out of date. 4-1

May I request the following (in the event that the Preferred Alternative is approved):

1) that the pole not be located on my property but either well north or south of it. There is no habitation or land use in these areas. At present one pole is on my property and the other just north of it; 4-2

2) that the access road should not cross my property since this would create an intolerable nuisance during construction, apart from potential hazard to property and safety; 4-3

3) that the corridor not be enlarged by 50 feet east, as this would destroy valuable old trees and make the line highly visible. 4-4

I would appreciate it if you would reply to this letter at your earliest convenience.

Very truly yours,

Paul Robitschek

PR:ckw

cc: Mr. Paul D. Higgins, Project Manager
Pacific Power & Light Company
920 S.W. Sixth Avenue
Portland, OR 97204

Response to comments in Letter 4:

4-1 See response to Common Issue No. 1.

4-2 Pacific has determined that placing a tower on the respondent's property can and will be avoided.

4-3 This concern cannot be accommodated until the detailed design studies for the proposed line have been completed, as the best location for the access road will not be known until that time. It is Pacific's policy to respond to the concerns of landowners as much as possible in the design and construction of its transmission facilities.

4-4 Comment noted. This concern cannot be addressed by Pacific engineers until design studies are undertaken. The DEIS (page 3-50, paragraph 3) refers to negotiated clearing and selective felling. It may be possible to site towers to minimize clearing and to employ selective topping and felling to reduce impacts on this residence.

28199 Cantrell Rd.
Eugene, OR 97402
June 9, 1982

5

Bureau of Land Management
Planning & Environmental Cordination Staff
P.O. Box 2965
Portland, OR 97208

RE: Bonneville Line

Gentlemen:

I protest your proposal for building a 500 KV Line from the Lane Station to the Spencer Station.

1. Why spend 7 million for a line from Spencer to Lane Station when 3 million would accomplish the same results with a line from Spencer to the Alvey Station.

2. If the line from Spencer to Lane is going to be necessary in 10 to 20 years, why not let the citizens enjoy the scenery for those 10 to 20 years without high tension towers.

3. In the present economic conditions, high interest rates and a possibility of deflation, how can you think that it would be less expensive today rather than 10 years from now to build the Lane to Spencer line if that is your reasoning for building it now.

4. Also, your study and impact statement is not valid today for the projected growth rate. As you must know, todays conditions have reversed the growth rate.] 5-1

5. It also seems that if you were interested in connecting your two 500 KV lines coming in from the North, it would be more practical to connect these North of the city, out in the farm land rather than disturb Eugene's ridge line and other forested areas South of the city.

6. I also protest Bonneville selling Oregon and Washington electricity to California so that their power bills decrease while our Northwest citizens are penalized with higher rates.

As a concerned, affected citizen, I beg of you to reconsider your options.

Sincerely,

Elsie B. Peck

ELSIE B. PECK

Response to comments in Letter 5:

5-1 See response to Common Issue No. 2.

28211 Cantrell
Eugene, Or 97402
June 9, 1982

Dear Sirs:

As concerned citizens and property owners we are writing concerning the new power line proposed for the Eugene to Medford area.

We live within close visual site of both the present line and the BPA substation on Nielson Road. We have not been informed that a new line was to be established. Having found out by accident that such a line was proposed and a hearing is only 10 days off, does not make it feasible to prepare adequately.

We do feel the larger towers will lower our property values, at a time when we are considering selling the same.] 6-1

We have looked over the draft proposal and feel the expense of seven million is too much at this time. Why not go the three million option with the economy the way it is at this time. We don't need higher electric rates and we don't want to see our power go to California.

Please put us on your mailing list and keep us informed in the future.

Thank you,

Mrs Joe R Meatte

Marlene Meatte (Mrs. JOE R.)

We have talked to an appraiser & he said the power line would lower our sale value an automatic 10%.] 6-1

Response to comments in Letter 6:

6-1 See response to Common Issue No. 3.

June 15, 1982

8

To the State of Oregon
Energy Facilities Siting Council

Greetings to you!

We are Otis and Roberta Hill. We own 48 acres of land in Section 5 of T. 37 R. 1E of the Willamette Meridian in Jackson County Oregon. We also own 400 acres in Sec. 10, T. 37, R. 1E of the Willamette Meridian.

We are opposed to the Eastern route of PP&L's proposed 500 kilovolt line from Eugene to Medford.

We have lived in our home since 1948 and our parents before us in the area since 1899. Since we live within 1000 feet of this proposed line we conour with comments of other people who have testified in this matter.

We agree with the Environmental Impact Statement page 6-8 paragraph two under Land Use that this proposed area in and around Antelope Creek is being and appears likely to be developed for rural residential use. We wonder who would like to live near such an immense power line and what PP&L and the Siting Council suggest ones like us who have 48 acres of road frontage land do. Is PP&L willing to recompense for future home sites on these lands which are unlikely to be developed since that power line will loom on either side of it?

The Environmental Impact Statement makes only general reference to geology and soils. We would like to suggest that the Siting Council and PP&L study the "Key Aggregate Resource Lands" map which is part of the data base for the county comprehensive plan. We especially call your attention to number 29 on that map. A description of this location estimates that ten million cubic yards of fair quality basaltic shale exists in a 600 acre area. It further states that the location should be considered as a future source of rock for county projects and sources needing pit run gravel.

We further suggest that careful study be given to this map and areas near to number 29 and in the vicinity of this big power line. 8-1

If PP&L's projection of a big increase in population is correct, then the need for aggregate resources will be a continuing and necessary one for the people of Jackson County now and in the future and should be protected and not hemmed in by a large power line.

Thank you for your thoughtful consideration of these matters.

Sincerely,

Otis + Roberta Hill
5550 E. Antelope Rd.
Eagle Point, Oregon 97524

Otis H. Hill
Roberta M. Hill

Response to comments in Letter 8:

8-1 The EIS emphasizes current and planned aggregate operations. A more extensive analysis of Jackson County aggregate resources appears in the Plan Consistency Report submitted to the County by Pacific for consideration in its route decision. The aggregate site referenced in this letter is a prospect, not an operating site. It is likely that the construction of the transmission line would reduce somewhat the amount of rock that could be taken from it, but would not preclude development of the aggregate site. This could be mitigated by careful centerline and tower location across the site.

STATEMENT BY ROBERT U. MACE and JACK C. MACE
RELATING TO THE DRAFT EIS ON PROPOSED EUGENE-
MEDFORD 500 KV TRANSMISSION LINE

June 15, 1982

My name is Robert U. Mace and my address is 8825 Highbanks Road Central Point, Oregon, 97502. I am appearing on behalf of my brother, Jack C. Mace, and myself, the two of us being joint owners of approximtely 170 acres bounded on the west by Highbanks Road. To be more specific, our property is the site where the existing 230 and 115 kV lines cross the Rogue River. Those lines run nearly parallel to the high bank on the south side of the river for about one-half mile on our land.

Our parents moved to the Highbanks ranch in 1928 and my brother and I were raised there. Several years ago, my wife and I purchased a home site immediately west of my father's residence and subsequently constructed a new home on the property. This became our permanent residence following my retirement in December, 1981. I do not want a 500 kV transmission line as a neighbor and intend to exert every effort in precluding that from happening.

In testifying before you, we would like to first comment on the draft EIS. It is an objective and well presented report and we recognize that drafting and defending such a document is a difficult task in the face of the many conflicting interests which would be impacted. Having said that, we do feel there are some areas which need clarification.

In our judgment, the reviewer would benefit from a summary of the rationale for selecting the preferred alternative over the other possible choices. What were the most significant factors influencing that selection and what were the trade-offs? Such a summary would, we feel, answer many questions which are bound to arise. 9-1

The draft inadequately addresses Alternative 1, the 'no action' alternative, apparently accepting the BPA and PP & L forecasts of future energy demands at face value. Those forecasts range from 3.8 to 5.6 percent annual growth, far exceeding the Northwest Power Council's most recent minimal estimate of 0.7 percent and the Oregon Department of Energy's forecast which, we understand, is in the neighborhood of 2 percent annually. The point is, do we need a 500 kV line in the face of the more conservative growth forecasts currently available? 9-2 The 'no action' alternative needs better exposure than is provided in the draft statement and we recommend that the merits of Alternative 1 be re-assessed in the final EIS for public review and for consideration by the Energy Facility Siting Council. 9-3

We have one other major concern with respect to the draft. That involves the undocumented conclusions as to the significance of the impacts caused by the line. Such conclusions are based more on conjecture than fact. For example, on page S-8 it is stated that constructing a 500 kV line across the commercial and light industrial development area in White City would have no effect (on land use) since it could be accommodated within the existing right-of-way. Were the realtors and development people in the area consulted before that judgment was made? We find it hard to believe that proximity to a 500 kV line is not considered by at least some potential customers interested in locating a commercial or industrial development. Certain commercial developments in the area are located very close to the existing 230 kV right-of-way (see Figure 1) and whether or not others could be encouraged to do so in the presence of a 500 kV line has not been determined. Another example occurs on page 3-2 where it is stated that the intensity of impacts at the existing (Rogue River) crossing is not significant becuase of the presence of the existing line. That is debatable since impacts don't disappear as more lines are constructed, particularly if one of these lines happens to be a buzzing kV installation. A contrary and probably stronger case can be made supporting the conclusion that impacts increase in geometric proportion to the number of high tension lines involved. 9-4

The remainder of our testimony will deal with why Option I and M are not the best choices. In the first place, those options would be costlier than the preferred alternative as pointed out in Summary Table 2 of the draft EIS. The existing 230 kV right-of-way was not designed to accommodate a 500 kV installation. Additional right-of-way would be required and costly angle structures to negotiate bends of nearly 90° are involved. In addition there is some question as to the adequacy of the rights conveyed to the California-Oregon Power Company when the 230 kV line was constructed. The agreement signed by my father on December 9, 1954, for example, conveys only the right to construct the transmission lines, guys and anchors, remove danger trees, and enter the property for erection, maintenance, repair and removal of transmission equipment. All other rights, including development and other activities not allowable under a 500 kV line, remain with the grantor. We contend that such rights under the existing right-of-way would have to be purchased, along with acquiring the additional 137½-foot wide strip. If other agreements negotiated by COPCO are similar and our claim is upheld, the cost would be substantially higher than indicated in the report. 9-5

A second and most telling argument against Options I and M is that more people are directly affected. Table 1-6 indicates that 130 to 160 dwellings would be within 1,000 feet of the line and thus subject to the noise, sparking, visual impact, TV and radio interference and potential health hazards associated with a 500 kV installation. If Sams Valley were by-passed through choice of Option H, the number of dwellings within the 1,000-foot distance would still be 100 to

120, far above the 20 to 24 residences similarly affected along the preferred alternative. The greatest concentration of houses exists in the White City area east of the Crater Lake Highway. (See Figure 2). In addition to the number of dwellings involved, the impact on commercial and industrial development in the White City area could have a negative influence on employment opportunities.

The third point we raise concerns the visual impact on that section at the base of Lower Table Rock which has been declared an Outstanding Natural Area by the BLM. Both Upper and Lower Table Rocks are being considered for designation as Areas of Critical Environmental Concern and, if that develops, the impacts would be even more serious. The much taller and more massive steel structures associated with a 500 kV line are much more visible and intrusive than the wooden towers now present.] 9-6

Our final point arguing against the choice of Options I and M is best stated on page 1-43 of the draft EIS. That reference emphasizes the drawback associated with locating all major transmission lines in one corridor, thus increasing the chance of coincident failure of the entire area's power supply should an accident or natural catastrophe occur. A plane crash, for example, could wipe out the power supply and leave no other transmission facilities available for by-passing the accident scene.

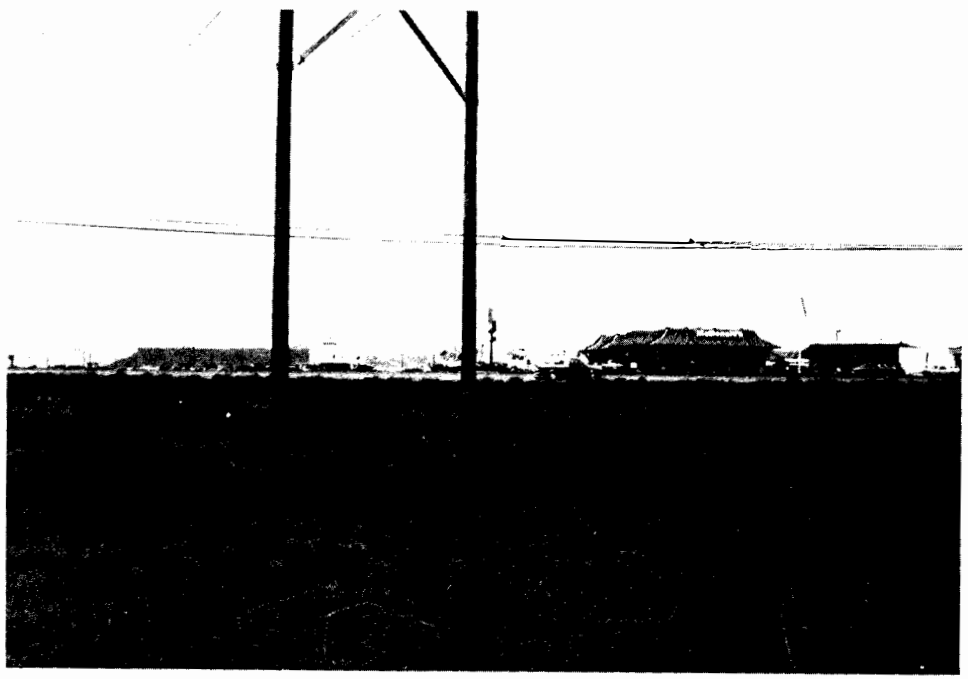
In conclusion, we would be directly impacted by construction of a 500 kV line as outlined in Option I. The Technical Investigations Report accompanying the draft EIS, states that the existing line passes within 250 feet of my home and the rental house formerly occupied by our father. That is too close for comfort but we are fortunate in that the state now has some control over such insensitive power line siting through authority of the Energy Facility Siting Council.

Our first recommendation is to take a closer look at the 'no action' alternative and we trust that the Energy Facility Siting Council will re-assess the power demand forecast issue when the matter comes before them. We feel this is a choice which would receive wide support and avoid pitting the various interest groups against one another. Failing that, and if it is decided to build the line, we argue against the choice of Option I or M due to the fact that they would be costlier, impact more dwellings, and run the risk of coincident failure of the area's power supply should all major transmission lines be confined to one corridor and an accident or natural catastrophe occur.

Respectuflly submitted,

Robert U. Mace

FIGURE 1



Commercial Development Abuts the Existing 230 kV Right=of-Way through White City.

Would close proximity to a 500 kV line be attractive to additional commercial industrial development?

FIGURE 2

The largest concentration of dwellings directly affected by locating a 500 kV line in the Medford Basin exists in the White City area east of the Crater Lake Highway.

Response to comments in Letter 9:

9-1 In accordance with CEQ Regulations (40 CFR 1502.14(e)) and the Department of the Interior manual (510 DM, 410A(2)), the cooperating agencies (BLM, BPA, and ODOE) identified an agency preferred alternative for use in the DEIS. This project configuration is identified in the FEIS as the draft preferred alternative.

The basis for this designation was public comment received during the scoping process in the early part of 1981 and routing workshops in the summer of 1981 (See Figure 4-1). Evidence, as it existed in September of 1981, indicated the draft preferred alternative routing in the Medford Basin would affect fewer people and resource values as compared to other identified routes. Likewise, the lack of comment from the Eugene area during scoping and routing workshops evidenced public acceptance of the existing BPA transmission corridor between Lane Substation and Spencer Switching Station.

Following identification of the agency draft preferred alternative, the contractor employed to prepare this EIS began detailed analysis which was displayed in the DEIS.

9-2 See response to Common Issue No. 4.

9-3 The no action alternative is discussed adequately in the EIS, both in terms of the adverse consequences which could occur with no action and the likelihood of adverse consequences. As was pointed out in the EFSC hearings on the need standard (S. Hannigan testimony of January 26, 1982), if the Oregon Department of Energy forecast growth rate were applied to Pacific's loads, the need for the 500 kV line would be delayed for one or perhaps two years. Given this minor difference and the greater risk associated with underforecasting as opposed to overforecasting, the no-action alternative received sufficient analysis.

9-4 The analyses supporting the conclusions summarized on pages S-8 and 3-2 of the DEIS appear on pages 3-44 and 3-47, and in photo-simulation Figures 22 to 24, Appendix C.

9-5 Prior to construction of the 500 kV line, Pacific Power and Light Company would review each existing easement and purchase all additional rights by negotiating with the property owners on a case-by-case basis.

9-6 The DEIS discusses visual impacts on Lower Table Rock on page 3-44 and Table 1-6 and acknowledges a moderately adverse visual

12

MAYOR'S OFFICE • P.O. BOX 1967 • EUGENE, OREGON 97440 • (503) 687-5010
R. A. 'GUS' KELLER

June 11, 1982

Bureau of Land Management
Planning and Environmental Coordination Staff (935)
PO Box 2965
Portland OR 97208

CITY OF EUGENE COMMENTS: DRAFT EIS FOR EUGENE-MEDFORD 500 KV LINE

City staff has reviewed the draft Environmental Impact Statement on the proposed Eugene-Medford 500-kV transmission line in regard to the segment of the proposed line that would affect the city of Eugene. The draft EIS appears to adequately outline potential environmental impacts of the proposed line. Indeed, the document points out many causes for concern if the proposed line goes through the South Hills of the city. However, the draft EIS is deficient in two significant ways. It inadequately addresses the impact on future growth along the South Hills Route. It also inadequately analyzes public need for the Lane-Spencer segment of the project. My remarks are directed to these concerns in hopes that the decision-makers for this project will take into account the City's point of view.] 12-1

Our concern is over the BPA segment of the project, specifically the Twin Oaks-Spencer section of the line. This section of the line runs through approximately three miles of the South Hills of the city. According to the draft EIS, this is the most populated area along the entire line to Medford. Briefly, our concerns are over the effects the proposed line will have on the livability and visual and recreational character of the South Hills and other possible environmental effects the line would have on nearby residents. For these reasons and based on existing City policy, the City cannot support this project within the city. Because this segment of the project is not needed even by BPA estimates until the mid-1990s, other alternatives to the South Hills route should be explored more extensively to achieve eventual need.

The City considers the South Hills a unique visual and recreational asset to the residents of Eugene. The City adopted the South Hills Study (Resolution 2295) in 1974 to help preserve the character of this area. The study is a refinement of the Eugene-Springfield Metropolitan Area General Plan, which is the City's adopted comprehensive plan. The study provides standards for development that are, among other things, sensitive to preservation of the visual character of the ridgeline area. The study also provides for a ridgeline park system. The City has made a substantial investment acquiring parkland along the South Hills to build the ridgeline park. We feel that placing 160-foot-high transmission towers in the already crowded BPA corridor would be contrary to the specific objectives of the South Hills Study.] 12-2

Perhaps our greatest overall environmental concern is the visual effect the proposed line will have on the South Hills. The project will have close- and long-range visual effects. The close-range effects are how the right-of-way will look to nearby residents. As mentioned earlier, this is the most densely populated portion of the whole corridor to Medford. The potential for affecting persons is greater here than anywhere else on the corridor. The draft EIS fails to take into consideration the magnitude of the impact of the South Hills route since further population growth along the route has not been accounted for. This area is within the City's urban growth boundary and is expected to grow significantly over the next 20 years. The existing BPA right-of-way is already crowded with 100-foot-tall steel lattice, 230-kV towers, and two wood-pole 115-kV lines. We feel that the proposed consolidation of the two 115-kV lines into one pole structure would be an improvement. However, the addition of a double-circuit 500-kV line will not only crowd the right-of-way but also will change the visual perspective of the line. The effect will not be in character with the surrounding wooded area. The draft EIS states that the "structures would extend above the surrounding trees, making the line visible from the streets and residences in the adjacent South Hills and Amazon neighborhoods between South Willamette Street and Dillard Road. . . The visual impact would be highly significant" (page III-39). The long-range effects are how visible the towers will be from the rest of the city. The draft EIS is silent on this matter, but it is of great concern to the City. The spot where the existing 230-kV line crosses Dillard Road is already highly visible from many parts of the city. Adding a higher tower at this and other locations will only make this situation worse.] 12-3

The proposed line will have indirect adverse effects on the quality of recreation in the South Hills, due mainly to visual impacts. The ridgeline trail in the South Hills is one of the City-designated recreation areas along the proposed line. The topography at Dillard Road and South Willamette Street exposes long views down the existing corridor to hikers along the ridgeline trail. The draft EIS concludes that "considering the importance of this park and the incremental visual impact of adding a 500-kV double-circuit line to the corridor which crosses it, the project would cause a moderate adverse effect on the quality of recreation experience despite the presence of existing lower-voltage lines" (page III-34).

The other major environmental concern the City has over the proposed line is the effect the line will have on nearby residents. Some of these are visual, noise, electric and magnetic effects, and the potential use of herbicides in the right-of-way. The residential development in South Eugene comprises approximately 25 percent of the total houses and all of the apartment units along the proposed route. Thus, any negative effects on nearby residents from the proposed line will be greatest in the South Eugene area.

As mentioned earlier, the draft EIS has determined that the proposed line would be likely to have highly significant visual impacts on the residential land uses in the South Hills area. The proposed line will produce noise through the corona effect, particularly during bad weather. The draft EIS indicates that as of yet, scientific research has not concluded that exposure to 500-kV transmission lines constitutes a health hazard. Yet it is likely that long-term exposure to eletromagnetic fields found on the right-of-way of a double-circuit 500-kV will eventually be shown to adversely affect human health in some way. Large insulated metal objects such as cars, trucks, and playground equipment can receive substantial induced currents under a 500-kV power line. A grounded person touching such an object can receive a shock ranging in intensity from imperceptible to hazardous depending on the height of the object above ground. 12-4

The draft EIS fails to demonstrate an immediate need for the Lane-Spencer segment of the project. This line is proposed to solve a "potential problem with the reliability of service in the Eugene area in the mid-1990s" (draft EIS, pages 1-3). The load growth projections used to make this forecast do not take into account either the effects of the current economic recession or the downward trend in energy consumption in the Eugene area. A more recent BPA load forecast (Draft BPA Forecast of Electrical Consumption--April 1982) takes into account this reduced consumption. If this document were used, the forecast for this project would indicate the project would not be needed for at least 25 years. 12-5

The City questions the advisability of exposing the South Hills residents to 10 to 25 years of a power line before it is needed. It is possible that forecast trends will be changed so that the line will not be needed until even later in the future, technological changes will occur that will make the line more acceptable in the future, or a more acceptable alternative route is chosen. By deferring the decision now, the BPA could work with the City to accomplish the goal of providing a reliable energy source to the area when it is needed in the future.

The City asks that the decision-makers for this project seriously consider choosing Option C rather than going through the South Hills of Eugene. In terms of the overall project, the project could be accomplished by constructing a 500-kV line linking Alvey (Goshen) substation with Meridian (Medford) substation. This option would require building a two-mile line from Alvey substation to Spencer switching station. The line would then proceed south to Medford. Alvey substation near Goshen would be the northern terminus of the proposed line rather than Lane Substation near Fern Ridge Reservoir. This option would eliminate the need to construct a line through the South Hills of the city.

According to the draft EIS, Option C has much less of an environmental impact than the proposed route through the South Hills. This includes the City's particular concerns over visual, recreational, and residential effects of the project. The argument is made that Option C does not fulfill the project's

intent as well as the preferred alternative because it will require expansion of Spencer switching station and it will postpone BPA's ultimate goal of a 500-kV loop around Eugene. Under Option C, Spencer switching station would have to be expanded by about 12 acres since there is not enough room at Alvey substation to accommodate the needed switches and support equipment. Yet, according to the draft EIS on page I-8, in order to accomplish the 500-kV loop around Eugene, it will require Option C to be constructed anyway. Choosing this option now will not hinder the BPA from achieving its ultimate goal, it will just delay it until it is needed.

To summarize, the City has serious and valid concerns over the segment of the proposed new line that traverses Eugene's South Hills. In our opinion, the evironmental impacts of the segment of the line far outweigh the convenience of building the line prior to need. Thus, we recommend that Option C be chosen. No matter what selection is made on the project, the City would like to work closely with you.

Thank you for considering our comments.

Sincerely,

Gus Keller

R. A. "Gus" Keller
Mayor

RAK:pm/Tb7

cc: Lane Council of Governments
Robert Beraud--BPA
Anthony Morrell--BPA
Peter Paquet--EFSC
Bob Barns--BLM

RESOLUTION NO. 3685

A RESOLUTION CONCERNING THE PROPOSED BONNEVILLE POWER ADMINISTRATION 500-KV TRANSMISSION LINE BETWEEN THE TWIN OAKS AND SPENCER SUBSTATION.

The City Council of the City of Eugene finds as follows:

1. The Bonneville Power Administration (BPA) has issued a Draft Environmental Impact Statement which has as a preferred alternative the construction of a 500-KV transmission line within an existing BPA power corridor for 11.5 miles from the Lane substation to the Spencer Switching Station.

2. The construction of this segment requires placement of 160 feet high transmission towers within portions of the city limits and urbanizable area within the urban growth boundary. The construction of such towers would produce severe and unacceptable consequences for the City of Eugene. In particular, the construction of double-circuit 500-KV towers would have:

a. Close and long-range visual and aesthetic effects. Structures would extend above surrounding trees, making the transmission line visible from neighborhoods in the southern portion of the City and portions of the line visible from the downtown area;

b. Detracting aesthetic impacts for views of Spencer's Butte. The preservation of the natural character of Spencer's Butte has been of critical concern to the City of Eugene for over 50 years. The City has expended considerable sums in the acquisition, preservation and maintenance of Spencer's Butte and desires to preserve this community investment;

c. Adverse effects on the quality of recreation in the South Hills. The City of Eugene has spent over 5 million dollars in the acquisition of real property in the South Hills area for a ridgeline park and trail system. The proposed transmission line is visible to users of such a park system and crosses through the park area at two separate locations.

3. The construction of the proposed transmission line is inconsistent with the text and diagram of the Metropolitan Area General Plan as refined by the South Hills Study.

4. Favorable consideration of alternative routes and options for such a transmission line by BPA is in the best interests of

the City. The City supports Option C within the Draft EIS as consistent with the concerns expressed above.

Now, therefore, based upon the above findings,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF EUGENE, a Municipal Corporation of the State of Oregon, as follows:

Section 1. The City staff is directed to take all necessary and appropriate action including but not limited to, testimony at hearings on the Draft EIS, intervention in the State of Oregon Energy Facility Council proceedings, examination of options for other legal proceedings, pursuit of legal remedies, and the like, to effect adoption of any reasonable alternative to the proposed preferred alternative in the Draft EIS.

Section 2. The City Council declares its strong opposition to the transmission line as planned and preferred by BPA. City staff is directed to advise the Council of developments in the siting of this transmission line as they occur.

The foregoing Resolution adopted the 16 day of June, 1982.

/s/ Warren Wong
City Recorder

Certified True Copy
Timothy J. [illegible]

HESSEL, GORDON & MURDOCK
PHYSICIANS AND SURGEONS, P.C.
677 EAST 12TH AVENUE, SUITE 510
EUGENE, OREGON 97401

RUS H. HESSEL, M.D., F.A.C.S.
ZNN M. GORDON, M.D., F.A.C.S.
JAMES L. MURDOCK, M.D., F.A.C.S.

GENERAL, THORACIC & VASCULAR SURGERY
OFFICE PHONE: (503) 485-1511

June 10, 1082

Gus Keller, Mayor
City of Eugene
City Hall
Eugene OR 97401

Dear Sir:

I am writing you about an issue of which you are likely well aware, namely the proposal of the Bonneville Power Administration to construct a 500 kV transmission line which will pass right through the South Hills of Eugene.

I was one of many citizens who received notification of this proposal in the form of the letter from Bonneville Power Administration of April 30th. However like most of my fellow citizens, I perceived nothing in the letter which seemed objectionable because BPA only refers to the fact that this transmission line will be between Eugene and Medford, and there is no suggestion at all that it would be crossing through a scenic and populated area of our South Hills.

Fortunately Mr. Charles Warren was not so easily lulled into complacency about this proposal, and took it upon himself to learn about the details of the BPA plan, and to condense the highlights of the plan into the enclosed literature. My wife has since been down to the Federal Court Building to discuss this problem with Mr. Ladd Sutton, and we have since reviewed the detailed brochures that the BPA has put out including the Environmental Impact Statement.

After reviewing these publications, I feel that Mr. Warren has well summarized the basic problem, and has good reason for being opposed to the BPA's "preferred alternative routing".

My wife and I are also strongly opposed to this "alternative routing" of the BPA, for several reasons.

First and foremost is an esthetic reason. We feel that to top two of the pretty hillsides in South Eugene with 160 foot high towers (connected to other similar towers running East and West from there) creates a prominent, ugly scar on the scenery of our wooded South Hills. The present power line in this location is certainly no beauty, but at least is not higher than the adjacent trees, and the vegetation has grown up in the area enough to make it blend in somewhat. However this new power line is so much taller that I feel it will be seen from great distances from several vistas in Eugene, and of course will dominate the scene of hikers and nature lovers who will be using the recently created connector trail between the City and Spencer Butte. In fact it appears likely to me that one of the towers, at the top of the hill just to the East of Willamette Street (between Willamette and Fox Hollow) will probably sit right on property recently acquired by the City as part of that ridge line connector trail. (I presume the City of Eugene anticipates considerable usage of this trail or it would not have spent a lot of time and money acquiring lands between Eugene and Spencer Butte to preserve this for the public use and pleasure).

Secondly, I am concerned about having electrical energy of this magnitude so close to a populated area. I recognize that I am not an electrical physicist and certainly make no claim to be an expert in this field. Thus I cannot disprove the statements made in the Bonneville Environmental Impact Statement that there are no known detrimental effects of exposure to high-power lines and their associated electro-magnetic phenomena (although it would appear that there is controversy about this). At the same time one can make a few extrapolations which would make one somewhat uneasy about categorically denying the possibility that exposure to such magnitudes of energy could be harmful, just because harmful effects have not yet been discovered. (It's very impressive to be near one of these power lines on a damp night and hear the "corona affect" described in the Environmental Impact Statement.) We do know for example that X-irradiation is the product of manipulation of high energy electrical currents and the hazards of exposure to this form of energy were not appreciated for years. There are many radiologist running around now who have had their fingers amputated because they dealt with these radiations in the early years of radiological science without realizing the harmful effects of prolonged exposure to such a radiation. Only through sad experience did the chronic tissue destruction, associated malignancies, etc. become apparent. The same observation could apply to recently accumulated knowledge concerning exposure to nuclear radiation, and its long-term effects. Certainly the soldiers who witnessed the initial atomic blasts in our western United States, having been told that there were "no known ill effects" of such exposure at the time, find this little solace to them at the present as they are being treated for leukemia.

The point is that the mere fact that we have no present knowledge of ill-effects of exposure to such high energy doesn't mean that such effects don't exist and might not become apparent after several years, and certainly it seems to me that the amounts of electrical power which are being discussed here are large. Therefore it seems unwise and objectionable to me that such a powerline should be run through a populated area when there do seem to be reasonable alternatives.

Mr. Warren has outlined the reasonable alternatives well, and I agree with his conclusions. In particular I agree that it does not make sense to avoid Option C (the Alvey to Spencer Line) entirely because of BPA's feeling that some years hence we will have to have a 500 kV line (or more) come through the South Hills anyway.

Even if the present recession in Eugene is well reversed and there is another population explosion, which will of course require more power, technology is also changing very rapidly and 15 or 20 years down the road we may be beaming power off satellites instead of running it across the countryside in high voltage lines. And if the population growth in Eugene is that great, that would make the presence of such a line in the heavily populated South Hills area even more objectionable and potentially dangerous to more poeple. Therefore it doesn't make sense to me to put such a line in the South Hills now just because of something that "might be needed" 15 or 20 years from now.

I realize that the BPA has acknowledged the esthetic disadvantages to the power line in the South Hills. On Page 1-48 they indicate that the impact on recreation in this area "would be significant" and later on Page 1-51 they acknowledge that this is the area "where the most serious adverse visual affects are likely".

However on Page 2-10 they indicate that the preferred routing "would cross the Ridgeline Trail being developed by the City of Eugene", but that "land acquisition for the trail has not yet included the points where the trail will cross the BPA transmission corridor between Twin Oaks and Spencer Switching Station". Unless I misunderstand the geography, this statement is no longer true as I understand that the City of Eugene has acquired all the land it needs to create the Ridgeline Connector between the City and Spencer Butte Park.

On Page 3-34 the BPA acknowledges that "where the trail joins South Willamette Street and Dillard Road and crosses the existing corridor there are long views down the transmission right-of-way. The trail appears likely to be used by large numbers of people engaged in passive recreation who would be sensitive to visual change". I certainly agree with that and would reiterate that to me this is the strongest reason not to place the powerline in that location.

Later on Page 3-39 the BPA indicate the structures "would extend above the surrounding trees, making the line visible from streets and residences in the adjacent South Hills and Amazon neighborhoods between South Willamette Street and Dillard Road. The moderately high scenic quality of these wooded residential areas and a large number of residential viewers indicate the high sensitivity of the visual context along this segment". Later in that paragraph they add that "the importance of the context indicates that the visual impact would be highly significant despite the presence of existing lines". I strongly agree.

Like Mr. Warren, I freely admit that we have property adjacent to this powerline easement, the value of which one could expect might be influenced (probably adversely) by the construction of such a transmission line. However we plan to occupy our present home for many years to come "if not all our lives", whether or not this new transmission line is built. Therefore if the property values decline our present plans would be little altered by this as we don't plan to sell any of the property. In fact one could even say it would help us by lowering the assessed valuation of the property itself and therefore our taxes.

My biggest concern remains an esthetic one. I think this powerline will make an ugly scar in one of the beautiful areas of our city which will be seen frequently by many residents of Eugene. It appears to me that viable alternatives are available and I feel that the City and in particular the Parks and Recreation Department, should be most interested in seeing to it that Bonneville situate its powerline elsewhere. I appreciate your attention to this matter.

Sincerely,

James L. Murdock, M.D.

JLM:tmc

Encl.: Copy: HELP

Response to comments in Letter 12:

12-1 See response to Common Issue No. 6.

12-2

The recreation, visual, and land use impacts of the project in the South Hills area are discussed in the DEIS on pages 3-34, 3-39, and 3-48 respectively. The preparers of the EIS were familiar with the relevant local government land use and recreation plans and with studies for the South Hills of Eugene. These were taken into account in the assessment of impacts in the DEIS.

12-3 Page 3-39 of the DEIS discusses those areas of Eugene from which the visual impacts of the line would be most significant. While visible from other parts of Eugene, the towers would be considerably further away and would cause correspondingly less impact.

12-4 See response to Common Issue No. 5.

12-5 See response to Common Issue No. 2.

Note: The letter from Mayor Keller of Eugene included two attachments, the text of City Council Resolution No. 3685 in opposition to the draft preferred alternative and favoring Option C, and a letter from James L. Murdock, M.D. to Mayor Keller. The resolution contained substantive comments about visual impacts, particularly in regard to the character of Spencer Butte and the nearby recreational trail system, and the consistency of the proposed project with the Metropolitan Area General Plan and the South Hills Study. The Murdock letter included comments on visual impacts, health and safety, property values, and the need for the Lane-Spencer Link. These comments duplicate the above comments and Common Issues No. 2, 3, and 5.

lane county

13

BOARD OF COMMISSIONERS
Vance Freeman
Scott Lieuallen
Gerald Rust, Jr.
Otto t'Hooft
Harold Rutherford

TESTIMONY BEFORE THE ENERGY FACILITY SITING COUNCIL

Eugene City Council Chambers June 17, 1982

Lane County Commissioner Jerry Rust

Jerry Rust

The need for a 500 K V power line through Eugene's South Hills is suspect on at least three grounds:

1) An alternative route exists (Alternative "C", Alvey to Spencer) which would not have the devastating effect of the proposed line.

2) New power projections, including the BPA's own projection means that the 500 K V line may never be needed -- at least not until the end of this century. 13-1

3) New technologies, including underground transmission, may make the need for the 500 K V line obsolete. A recent study completed in Eugene indicates that at least 22% of electrical usage in Eugene residences can be displaced by solar energy. 13-2

Given this information and the other points cited above it would appear that the need for this line is dubious. Certainly the proposed route is out of the question. There is most certainly no sense of urgency. I recommend the Energy Facility Siting Council deny the route through the South Hills, and permit construction only of the Alvey-Spencer Link.

BOARD OF COUNTY COMMISSIONERS
COURTHOUSE - PUBLIC SERVICE BUILDING / 125 EAST 8TH AVENUE / EUGENE, OREGON 97401 / (503) 687-4203 / 1-800-452-6379

Response to comments in Letter 13:

13-1 See response to Common Issues No. 2 and 4.

13-2 Underground transmission of extra high voltage (EHV, generally 345 kV to 800 kV) power is not currently feasible, except over very short distances, due to the extremely high cost involved. On a per-mile basis, underground transmission is approximately five times more costly than overhead transmission.

Non-transmission alternatives to the proposed project, including conservation or electricity displacement, were considered during the initial EFSC hearings for the project. These alternatives were determined by EFSC to be insufficient to satisfy the need for the project, as stated in the Hearings Officer's Report and Recommendation. See responses to Common Issues No. 2 and 4.

THE LEAGUE OF WOMEN VOTERS OF CENTRAL LANE COUNTY

Affiliated with the League of Women Voters of Oregon and of the United States

15

June 17, 1982

To: Bonneville Power Administration / Energy Facility Siting Council

Re: Proposed 500-kv transmission line

The League of Women Voters of Central Lane County opposes Bonneville's proposed 500-kv transmission line through Eugene's South Hills from the Spencer Switching Station to the Lane Substation.

Statewide planning goal #5, Eugene's Community Goals and Policies, and the South Hills Study all address the concept of compatible use and the importance of visual and recreational values.

One specific recommendation of the South Hills Study is "That developments be reviewed in terms of scale, bulk and height to insure that development blends with rather than dominates the natural characteristics of the south hills area." (Pages 4 & 5, Exhibit A, Resolution 2295 adopting the South Hills Study recommendations) 15-1

No one can deny that 160 foot towers will dominate the south hills landscape.

Since the proposed location of these transmission lines does not comply with duly-adopted goals, policies and recommendations, it should be denied based on those grounds alone.

Esther Loy

Esther Loy, President
2683 Elinor St.
Eugene, Or. 97403

Response to comments in Letter 15:

15-1 Page 3-39 of the DEIS acknowledges that the visual impact of "double circuit structures would be highly significant, despite the presence of existing lines." The use of these towers would, however, avoid the need to expand the right-of-way in the South Hills and the visual and land use impacts associated with that expansion.

MEMORANDUM

To: Bureau of Land Management, Planning and Environmental Coordination Staff

From: City of Eugene

Re: DRAFT ENVIRONMENTAL IMPACT STATEMENT - PROPOSED EUGENE-MEDFORD 500 KV TRANSMISSION LINE

==========

The City of Eugene is concerned over the Draft Environmental Impact Statement (EIS) which suggests that the preferred alternative is advantageous compared to other options for the Eugene BPA portion of the transmission line. Other presented testimony is being submitted by Mayor Keller and Councilor Wooten relative to these concerns.

The City urges favorable consideration of Option B or Option C. We suggest that the Draft EIS be improved in the following ways:

a. This visual and aesthetic effects of selection of Option A are understated. The scenic impacts discussed on pp. 2-11 and 2-12 of the Draft EIS fail to discuss and evaluate the visual effects of the transmission towers for a viewer from the central Eugene area. The visibility of such towers, particularly when they mar the central Eugene property view of Spencer's Butte, is of significant concern. 16-1

Other testimony, concurrently submitted, details the significance of the South Hills park system and Spencer's Butte to the City. It is not surprising that an outside evaluator and the drafters of this EIS failed to recognize the critical importance of maintenance of this view and preservation of the greenbelt to the City. To one versed in our cultural, social and economic history, the significance cannot be understated.

b. Oregon's mandated system of land use planning requires compact urban growth and preservation of agricultural and forest resource land. To the extent transmission lines of this size are located within urban areas they discourage intensive urban uses. This, in turn, creates pressure for expansion of the urban area to accomodate such uses leading to conversion of rural agricultural and forest resource lands. While it is true that selection of Option C would involve some resource land conversion, the selection of Option A would also eventually lead to similar resource consumption by the displacement of urbanizing land.

This consequence should be considered in the alternatives evaluation.

c. Critical LCDC Goal evaluations for Option A are lacking. We believe selection of that option has particular effects for Goal 5 (Open Spaces) than discussed at Table 1-7 and for Goal 10 (Housing) in the effects upon new residential housing in the affected area. 16-2

d. At two points the proposed transmission line with the preferred alternative will intersect properties acquired for parkland use by the City of Eugene. Discussion at p. 3-34 should be corrected in this regard. 16-3

Similarly, discussion of construction effects upon park and ridgeline trail users (pp. 1-36 and 1-37) could be expanded. 16-4

e. Visual and aesthetic effects of users of Spencer's Butte Park particularly when viewing scenery in a northern direction at the summit are not noted except that it is opined as not significant (p. 3-34). This is incorrect, we believe, and should be corrected. 16-5

f. Discussion at pp. 2-12 et seq on land use and urbanizing trends for the area outside the Eugene Urban Growth Boundary is incorrect. Much of those lands are resource lands and will not be subdivided under statewide landuse planning. Large lot rural subdivisions will not continue as has occurred in the past. Thus, the present or future selection of Option B should be re-evaluated. 16-6

The City will provide additional and more detailed comment by July 7. We urge favorable reception of our perspective. Thank you for your consideration of these issues.

JOHNSON, HARRANG & SWANSON
CITY ATTORNEYS

By Timothy J. Sercombe
Timothy J. Sercombe
Attorneys for City of Eugene
P. O. Box 11620
Eugene, Oregon 97440

Response to comments in Letter 16:

16-1 We assume that this memorandum from the City of Eugene actually means Option A to stand for the Preferred Alternative in the DEIS. If so, this comment is substantially the same as comment 12-3 (see response above).

16-2 See responses to Comment No. 12-2 and Common Issue No. 6.

16-3 Information concerning current and planned recreation development near the proposed corridor was solicited from the City of Eugene during the preparation of the DEIS. At that time, the City indicated that acquisition of land for the Ridgeline Trail was not taking place within the existing right-of-way. If this is not the case, and the City is or will be acquiring land within the right-of-way,this change would have no effect on the analysis of impact significance or the operation of the corridor itself. Recreational use of this right-of-way would be permitted by BPA as long as any such recreational development complies with the pre-existing conditions of BPA's right-of-way easement, which has been in place for many years. Land within the right-of-way acquired by the City would still be subject to the easement conditions, and these conditions would not be changed by the proposed reconstruction within the existing right-of-way.

16-4 Construction effects of the project would be extremely short in duration and would have minimal impact on trail users.

16-5 From the top of Spencer Butte, the visible portions of the line are those parts to the east and west of the city limits, in less-urbanized areas outside the Urban Growth Boundary. Views of the part of the line within the city limits are blocked by the lower shopes of Spencer Butte and trees within the park. From the trails in Spencer Butte Park there are no views of the line to the north.

16-6 Much of the area through which Option B would pass has already been subdivided and development is proceeding on some of these parcels of land at present.

Charles E. Warren

1158 HIGH STREET
P. O. BOX 1818
EUGENE, OREGON 97440
503-484-7445

18

16 June 1982

Bureau of Land Management
Planning and Environmental Coordination Staff (935)
P. O. Box 2965
Portland, OR 97208

Gentlemen:

My name is Charles Warren, I live at 86260 Lorane Hwy. I am writing on behalf of myself and 17 of my neighbors, who live within 1,000' of your existing 230 kV line. To be more specific, 7 families live within 1,000', 6 live within 500', and 5, including myself, live within 300' or less. We all live along a one mile stretch of your line in an area west of Eugene where your 230 kV lines cross the Lorane Hwy. More specifically, two miles west of a point you call Twin Oaks. The names and addresses of the 17 families I represent are attached.

Your preferred alternative, that of routing the new 500 kV line west to the Lane Substation, constitutes taking an additional 125' of right-of-way in our area, and erecting huge 160', double circuit towers parallel to your existing 80' 230 kV towers.

Gentlemen, unless you lived in our area, I don't think there is any way you can conceive of the impact that these lines will have on us. You are not talking about going through some rural, sparsely populated farmland, you are going through prime wooded, residential countryside. Your 125' swath would take our timber and cross over what we consider our front and back yards. In two of my neighbors' cases, Mr. Murdock and Mr. Webber, your 500 kV line and towers will literally be within 100' of their houses. Most of the land in our area is a healthy stand of second growth timber, sprinkled with meadows, streams, and some small farming plots.

Your existing 80' towers and 90' right-of-way are reminder enough of the scar we bear from the time you came through in the 1960's and put the original line in. We at least had the consolation at that time that the remaining timber on the sides of the right-of-way was comparable to the height of the existing towers. But you now propose to clear an additional 125' and put up 160' towers, which would protrude a good 60' above the tree cover and of course be grotesque monsters in the open areas. Besides this disfiguration to the natural beauty of the Lorane Valley, we worry as much or more

about the magnitude of these new lines. Four times more energy will be going through them than the existing 230 kV lines. My children must walk a half mile underneath your existing lines to reach their bus stop for school. My children and my neighbors' children stand directly under your existing 230 kV lines to catch their bus, and there is a second bus stop about 200' up the highway on the other side. 18-1

We've heard our children for years comment about the noise and the crackling sounds that that 230 kV line emits, especially in the winter. We have come to live with and somewhat ignore the many comments one hears of the potential effects of the magnetic field generated by large power lines. But now you propose to multiply that energy by four times, and still expect us not to worry or be concerned. 18-2

Your EIS study states that there are only 24-28 homes within 1,000' along our entire 7.5 mile corridor from Twin Oaks to Lane. But when you consider that in just our one mile stretch, 17 homes are within 1,000', and there are also 7 homes within 1,000' in a 1/4 mile stretch west of Bailey Hill Road and another 6 homes in a 1/4 mile stretch near Crow Road and Durhobor Road, this represents 31 homes within 1,000' in approximately 1-1/2 miles of line. I have not counted the number of homes that are affected in the other 6 miles but I would suggest that the EIS study has grossly underestimated the number of people affected, and their proximity to the line. Many of the homes I speak of are within a few hundred feet of the corridor and one home west of Bailey Hill Road sits on the south edge of your existing right-of-way. By taking an additional 125' your line will literally go directly over his house. I would assume that your home count was done, and understandably so, by aerial photography. If however, you actually walked the line, and physically counted the homes, you would see that in our area, homes are built in and under trees, incorporating the woods and vegetation, and many cannot be seen from the air. 18-3

While we know that our numbers are much larger than the EIS study reflects, they obviously don't compare with the plight of the people of South Eugene. I know the residents of the South Hills area can and are speaking for themselves, but it absolutely stretches one's imagination to try to understand the logic and the common sense in your choosing as your preferred alternative route to go down through the South Hills area. This area by your own EIS study reflects 80-90 houses, 230-290 apartments, and one school within 1,000' of the existing corridor. By a very conservative count this has got to affect well over 1,000 people. More importantly, how many people will be within that 1,000' radius 10 years from now, when you consider the South Hills, by our own Metro Plan, is destined to be one of the fastest growing areas within our urban boundaries. How can 18-4

you ignore the effects to all these people of the noise, possible TV and radio interference, and who really knows what else. Also, when you consider all the efforts over the last 10 years by the people of Eugene to preserve the natural beauty and timber of the South Hills, how can you then prefer to permanently mar the South Hills basin with towers that will reach at a minimum 60' above the existing tree cover, the tree cover we fought so hard to protect.

By preferring this route, it is plain to see you have no comprehension of the "liveability" that Eugenians hold so dear.

Let me ehphasize that I am not opposed to the construction of this power line. I don't pretend to have the technical knowledge to argue whether it is needed, or question the electricity's ultimate destination. I am also strongly in favor of economic diversification for our area, but I am strongly opposed, for all the reasons I have stated, to your preferred alternative to the west from Spencer to Lane. I could see logic in going down your existing corridor if this was just another power line, but by your own technical data it is not just another line. It is 160' high and as powerful as any line in the northwest, and as far as I can tell, except for some experimental lines, as large as any in the United States.

Your own data points out you don't have to go west to Lane at all, but could take the option C route, from Spencer east 2 miles to Alvey. Your own EIS study points out that no people will be affected, no one lives within 1,000' of the option C route, and construction costs of option C would be approximately $9 million less than taking the line west to Lane.

Why then has not this seemingly logical option been chosen as your preferred alternative? In reading all your technical manuals and discussing the situation with your local Bonneville officials, I can find only two reasons why you are not in favor of going east with option C. One is you state you must acquire an additional 12 acres to enlarge the Alvey station. I hardly see this as a stumbling block. The cost of the additional 12 acres is certainly still far below the cost of taking the line to the west, and for fear of offending somebody, I don't think anyone would consider the Alvey area (basically the Goshen interchange) as prime future residential property. The second and seemingly only legitimate reason you give for not using option C is that you state "EVENTUALLY" that a 500 kV line will need to be hooked up with Lane so that you will have Eugene completely circled with 500 kV circuit, in order to provide a better load and balance factor and meet future projected power needs. While I respect Bonneville's, or any company's, need to plan ahead, this word "EVENTUALLY" is one that I have had a hard time trying to pin 18-5

down. The closest I can come through discussions with local Bonneville officials and in reading your technical manuals is that sometime in the 1990's you project this situation will be necessary.

I submit, gentlemen, that while it may be necessary in 15-20 years, this necessity is still only based on your projections and assumptions, which I would presume were made prior to the unfortunate economic slump and setback that this area has experienced as of late, and may continue to experience for some time to come.

Secondly, I submit that in this time of rapidly changing technology, is it not a little difficult to predict not only what type of power we will be utilizing in the 21st century, but also the means of transporting that power from one point to another.

Thirdly, I submit with all due respect, your own credibility is not exactly at its zenith with the many problems you have had recently in the northwest.

Thus, gentlemen, why should well over 1,000 people who now live along your preferred alternative and unquestionably thousands more in 15-20 years, have to live and suffer all that time because of something that may or may not ever be a reality.

In closing, I urge you to consider option C. It is a dramatic cost savings to you, it affects literally no one, and will assure us of preserving the natural beauty and environmental standards that this community holds so dear.

Sincerely,

Charles E. Warren
86260 Lorane Hwy.
Eugene, OR 97405

/kcc

Encl.

The names and addresses of the people I represent who live within 1,000' of your line in our one mile area are listed below. The one mile stretch we all live along is at the point where your 230 kV line crosses the Lorane Hwy. west of Eugene. Our residences are located from 1/4 mile east of the highway crossing to 3/4 mile west of the crossing.

Residents	Proximity to Existing Right-of-way
Mr. & Mrs. Wayne Webber 86279 Lorane Hwy. Eugene, OR 97405	200'
Mrs. Andra Marxer 86289 Lorane Hwy. Eugene, OR 97405	300'
Mr. & Mrs. James Floras 86147 Lorane Hwy. Eugene, OR 97405	900'
Mr. & Mrs. Bob Gunter 86281 Lorane Hwy. Eugene, OR 97405	300'
Mr. & Mrs. Charles Cookson 86299 Lorane Hwy. Eugene, OR 97405	500'
Brad McNally 86313 Lorane Hwy. Eugene, OR 97405	800'
Mr. & Mrs. Howard R. McBeth 86339 Lorane Hwy. Eugene, OR 97405	1,000'
Mr. & Mrs. Charles Warren 86260 Lorane Hwy. Eugene, OR 97405	400'
Dr. & Mrs. Charles Williams 86270 Lorane Hwy. Eugene, OR 97405	400'
Mr. & Mrs. Thomas F. Murdock 86250 Lorane Hwy. Eugene, OR 97405	250'
Larry & Aloma Douroux 86319 Lorane Hwy. Eugene, OR 97405	800'

Residents	Proximity to Existing Right-of-way
Mr. & Mrs. Marvin Wines 86232 Lorane Hwy. Eugene, OR 97405	1,000'
Mr. & Mrs. Gary Willis 86020 Lorane Hwy. Eugene, OR 97405	1,000'
Mr. & Mrs. John Horsfall 86230 Lorane Hwy. Eugene, OR 97405	900'
Dr. & Mrs. Egge 86210 Lorane Hwy. Eugene, OR 97405	600'
Mr. & Mrs. John Hirons 86240 Lorane Hwy. Eugene, OR 97405	1,000'
Mr. James M. Huffman Tax Lot 700 Bailey Hill Rd. Eugene, OR 97405 (Lives on premises, but no mailing address)	300'
Mr. & Mrs. Larry Ebert 86419 Bailey Hill Rd. Eugene, OR 97405	600'

Response to comments in Letter 18:

18-1 See response to Common Issue No. 5.

18-2 See response to Common Issue No. 5.

18-3 See response to Common Issue No. 1. House counts in the area south of Eugene have been checked again and have been revised in the FEIS (see Tables 1-4 and 1-5). There are very few houses or road crossings in the "other six miles" mentioned in this comment.

18-4 See response to Common Issue No. 6.

18-5 See response to Common Issue No. 2.

DON JELLUM
9100 Highway 234
Gold Hill, Oregon, 97525

23

June 21, 82

Attention Lighting Council.

I am a resident and property owner affected by the proposed 230KV power line, just 200 feet from it and definitly do not want the ugly metal towers and a 500kv line - that will take out my new barn, and be right next to my home!

I think the real bottom line in this matter is people! I appreciate the Environmental Impact Statement, I have planted 1700 trees on my property and respect wildlife, but peoples rights and needs should be paramount in the final decision. The route choosen should be the one affecting the least people now, and in the future.

The existing corridor passes through Soms Valley and White City where there is the heaviest concentration of people, farms, and commercial & industry. And the future holds an ever expanding population along this route. 23-1

The eastern route impacts fewer people - crosses thru the hills, where there will be less and out of sight of the populace.

It is my understanding that the eastern route is also the least expensive to build.

I also am appalled at the thought of defacing Table Rock with a high power line - this is a natural beauty and should be preserved.

Please consider peoples needs and desires.

Thank you, Don Jellum

DON JELLUM
9100 Highway 234
Gold Hill, Oregon, 97525

Response to comments in Letter 23:

23-1 See response to Common Issue No. 6.

24

Att: Sighting Council
Bureau of Land Management
Planning & Environmental Coordination Staff (935)
P.O. Box 2965
Portland, Oregon 97208

Dear Sir:

Because there is much more power now than we need and because as a senior citizen we do not need more expense added to our already high cost of living, we do not need the proposed Eugene-Medford 500KV transmission line or our existing route. 24-1

Yours truly,
Beatrice G. Sagner
230 Crossway Rd.
Gold Hill, Ore.
97525
(Sam's Valley Area)

Response to comments in Letter 24:

24-1 See response to Common Issue No. 4.

AFSETH, JACOBS & SCHMITZ, ARCHITECTS, A.I.A.
2850 EAST BARNETT ROAD MEDFORD, OREGON 97501 (503) 779-5237

25

June 21, 1982

Bureau of Land Management
Planning & Environmental Coordination Staff (935)
P.O. Box 2965
Portland, OR 97208

Dear Sirs:

This letter is written to express my strong objection to the routing of the new 500 KV transmission line along Unit 19 of the existing right-of-way.

I disagree with the statement on page 6-68 of the Technical Investigations report which says, "A total of 9 to 11 houses are located within the 1000 foot zone . . .", there being a significant number more. In addition, a recent increase in houses constructed in the area between Foothills Road and the existing power line makes the proposed line impact many more individuals than before. 25-1

The location and maintenance of this line in its present location affects the visual environment well to the west of the "1000 foot zone," indeed, the entire valley floor will be affected from Medford to Central Point.

In addition to the visual pollution, the necessary maintenance road will promote (as now exists with the present line) noise pollution caused by the numerous trail bikes. These bikers cannot be successfully kept off of this road.

Enclosed is a suggested alternate route which would eliminate the visual incursion into an area receiving tremendous residential growth far beyond that indicated in the Technical Investigation report. 25-2

Very truly yours,

Peter D. Schmitz, A.I.A.

PDS:mk
Enc.
cc: Ed Shipley
Peter Sage
Jon Deason

GARY N. AFSETH D. LORIN JACOBS PETER D. SCHMITZ

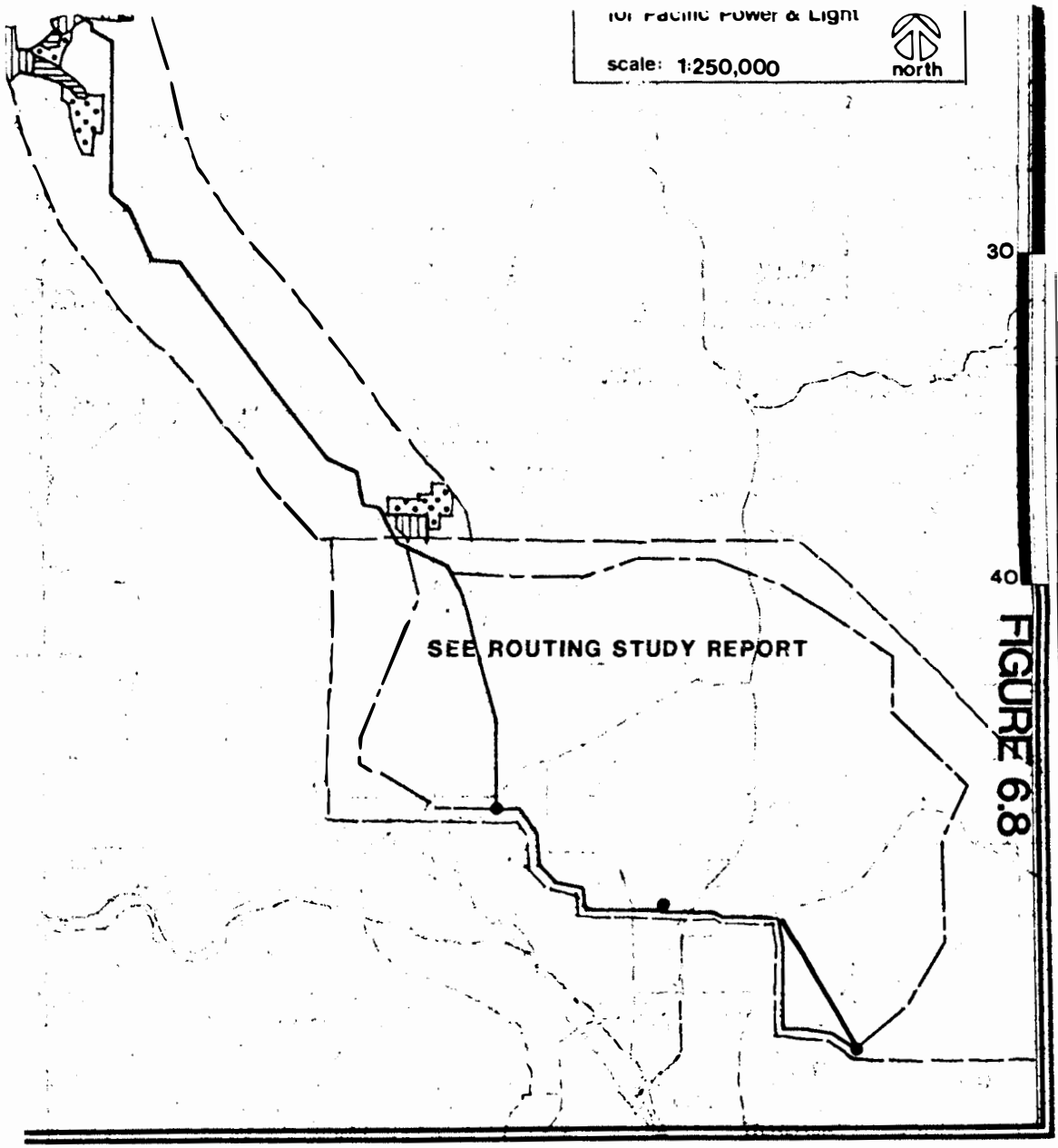


FIGURE 6.8

Response to comments in Letter 25:

25-1 See response to Common Issue No. 1. The house counts in this area have been rechecked, confirming that the counts and descriptions in the Technical Investigations and DEIS are correct.

25-2 See response to Common Issues No. 1 and 6. It should further be noted that in June of 1982 the Jackson County Board of Commissioners approved a 500 kV powerline along the existing corridor through the Medford Basin, at the same time determining that the other route options would be inconsistent with county planning guidelines.

The suggested route alteration would also pass directly over the Jackson County Sports Park; this would no doubt create significant impacts and local opposition, and would probably be unacceptable to the County. Finally, consideration of an additional route option at this time would not be allowed under the State of Oregon's siting process.

PAUL ROBITSCHEK
32945 DILLARD ROAD
EUGENE, OREGON 97405

26

June 21, 1982

Bureau of Land Management
Planning and Enviromental
Coordination Staff (935)
P.O. Box2965
Portland, OR 97208

re: 1792.64
PP&L (935)

Gentlemen:

This is with reference to Draft EIS relating to PP&L line from Eugene to Medford.

The data presented in the EIS lead to the inescapable conclusion that there is no justification for the proposed line.

In the prior 5 year period (1976-77 to 1980-81) the peak power increase was 6.6% with a maximum of 11.3%. This period includes years of almost unprecedented housing boom. Yet in the future 5 years the use is to increase by 24.5%. (cf. 1-1, Table 1-1)

These future projections are clearly absurd. The recent permanent closure of two major pulp mills and of a number of other wood processing plants in Oregon, as well as increasing consumer conservation and energy changeovers dictated by rising cost of electricity, reinforce this conclusion. 26-1

Reviewing the testimony of Mr. Hannigan of PP&L at the Energy Facility Siting Council on 1-26-81 (who also testified on the need for the Pebble Springs nuclear plant), it is apparent that it relies on simplistic models bearing little relation to the realities of Oregon economy.

The line will have a major adverse enviromental impact.

I urge that BLM should oppose it.

May I have your response?

Very truly yours

Paul Robitschek

Response to comments in Letter 26:

26-1 See responses to Common Issues No. 2 and 4.

27

Executive Department

155 COTTAGE STREET N.E., SALEM, OREGON 97310

VICTOR ATIYEH
GOVERNOR

June 22, 1982

Chief
Division of Resources
USDI, Bureau of Land Management
P. O. Box 2965
Portland, OR 97208

Subject: Eugene-Medford 500 KV Transmission Line
PNRS # OR820511-029-4

Thank you for submitting your draft Environmental Impact Statement for State of Oregon review and comment.

Your draft was referred to the appropriate state agencies. The Departments of Land Conservation and Development, Fish and Wildlife, Forestry, and Environmental Quality offered the enclosed comments which should be addressed in preparation of the final Environmental Impact Statement.

We will expect to receive copies of the final statement as required by Council of Environmental Quality Guidelines.

Sincerely,

INTERGOVERNMENTAL RELATIONS DIVISION

Kay F. Wilcox

Kay F. Wilcox
A-95 Coordinator

KW:mh
Enclosures

Forestry Department
OFFICE OF STATE FORESTER

2600 STATE STREET, SALEM, OREGON 97310 PHONE 378-2560

VICTOR ATIYEH
GOVERNOR

May 27, 1982

Lynn Frank, Director
Department of Energy
Labor & Industries Building
Room 102
Salem, Oregon 97310

Subject: DEIS: Proposed Eugene-Medford 500kV Transmission Line

Dear Lynn:

The draft environmental impact statement (DEIS) includes the information we requested in our letter of December 21, 1981, regarding impacts on revenue, jobs, wages, and other benefits related to the forest land that would be converted to powerline use. This is the type of information we feel is necessary in all proposals of this type.

In regards to the alternatives presented in the DEIS, this Department recommends that the State, through the Department of Energy, should consider Alternative 3 as the State preferred alternative.

As the DEIS notes, Alternative 3 would provide the most transmission capacity in the existing corridor and would satisfy both the short-term need and long-term (power) requirements. We note that the DEIS Preferred Alternative does not, in the long term, satisfy purpose No. 1 (minimize environmental impact) and No. 2 (accommodate future power needs). It also may not meet purpose No. 4 in the long term (minimize cost). The DEIS does not present sufficient cost information to analyze the long-term costs of the alternatives. 27-1

Alternative 3, in addition to meeting purposes 1 and 2, (and perhaps 3) in the long term, comes closest to satisfying Statewide Planning Goal No. 4 (Forestry) and the Forestry Program for Oregon's objective of conserving the forest land base.

This Department does not have sufficient information or expertise to fully analyze the proposal and the alternatives. Our suggestion is that the Department of Energy consider our recommendations along with other agency responses to derive a State response.

If you have questions, please call either Dave Stere (378-5387) or Phil Brogan (378-2566). Thank you for the opportunity to participate.

Sincerely,

H. Mike Miller
State Forester

cc: Board of Forestry
Executive Staff
Oregon Congressional Delegation
Assistants to Congressional Delegation
Carolyn Magruder
Charles J. Hanlon
William Leavell - BLM
Jeff Sirmon - USFS
Pat Amedeo
Clarence Parker
Jim Ross
State Clearinghouse (PNRS 320511-029-4)
Carl Newport
Norm Bjorklund
Randy O'Toole
Jim Monteith
David S. Hill
Lee Miller - Lane County Planning Director
Keith Cubic - Douglas County Planning Director
Jackson County Planning Director

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage St NE , Salem, Oregon , 97310
Phone Number: 378-3732

PNRS STATE REVIEW

Project #: OR 320511-029-4 Return Date: JUN 11 1982

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

(X) The environmental impact is adequately described.

(X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

Oregon State Forestry Department's recommendation and comments are included in letter to Mr. Lynn Frank, Director, Department of Energy. (Copy attached)

Agency Forestry By Phil Brogan

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage St NE , Salem, Oregon, 97310
Phone Number: 378-3732

Dept. of Environmental Quality

PNRS STATE REVIEW

RECEIVED JUN 10 1982

Project #: OR 820511-029-4 Return Date: JUN 11 1982

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

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ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

( ) The environmental impact is adequately described.

(X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

Although Chapter 3 page 79 contains information on State environmental noise standards, the report does not provide data on the existing environmental noise conditions (Chapter 2) nor are the relative noise impacts to residences evaluated for each alternative. In addition, no discussion was included that describes strategies to prevent future noise conflicts due to new residential development. 27-2 27-3 27-4

Agency DEQ By [signature] 229-5989

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
155 Cottage St NE , Salem, Oregon, 97310
Phone Number: 378-3732

INTERGOVERNMENTAL RELATIONS DIVISION

JUN 10 1982

PNRS STATE REVIEW

Project #: OR 320511-029-4 Return Date: JUN 11 1982

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

(X) The environmental impact is adequately described.

( ) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

The Oregon Department of Fish and Wildlife is not in favor of the preferred alternative. Encroachment into the deer winter range habitat resulting in increased vehicle access to this area would be detrimental to wildlife.

Agency Fish & Wildlife By [signature]

VICTOR ATIYEH
GOVERNOR

Department of Land Conservation and Development

1175 COURT STREET N.E., SALEM, OREGON 97310 PHONE (503) 378-4926

M E M O R A N D U M

June 18, 1982

TO: Philip C. Hamilton, Division of Resources Chief
Bureau of Land Management

FROM: James F. Ross, Director

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT: PROPOSED EUGENE-MEDFORD 500 KV TRANSMISSION LINE

The DEIS includes an extensive analysis of the alternatives which will be of assistance to various agencies as they determine which alternative has land use impacts that are most consistent with their land use plans, regulations and the State's Planning Goals.

The procedure for addressing land use impacts of the different transmission alternatives is well presented on page 1-54, with two minor exceptions.

1. (paragraph 2) "...all counties and cities are required to develop and adopt comprehensive plans and land use goals..." Change "goals" to "land use regulations." 27-5

2. The Federal Land Use Planning and Management Act (43 USC 1712 and 1720) should also be referenced on page 1-54 in conjunction with coordination responsibilities of federal agencies. 27-6

Table 1-7 implies that Goals 4, 5, and 11 have the greatest range of land use impacts from the transmission alternatives. We agree with this assessment, and recommend that findings for the final alternative be more conclusive for these goals.

Also, when local government comprehensive plans and land use regulations are acknowledged by the LCDC, then the Energy Facility Siting Council need only find that the acknowledged jurisdiction has determined that the project is consistent or inconsistent with its acknowledged plan and land use regulations. This acknowledgment status currently applies to the area inside the Eugene city limits.

If you have questions related to the land use Goals, please contact Jim Claypool, State Agency Coordinator (378-4098); Mel Lucas, Field Representative for Douglas and Jackson Counties (776-6084); or Greg Winterowd, Field Representative for Lane County (378-8644).

JFR:JHC:kg
9954A/1DB

cc: Peter Paquet, ODOE
Mike Miller, DOF
Mel Lucas, DLCD
Greg Winterowd, DLCD
Lee Miller, Lane County Planning
Keith Cubic, Douglas County Planning
Bob Britzman, Jackson County Planning
Kay Wilcox, IRD (PNRS 820511 0294)

Response to comments in Letter 27:

27-1 The DEIS acknowledges that meeting long-term transmission needs and minimizing costs are important considerations, and that the draft preferred alternative would not fully satisfy all projected long-term requirements. The key factor in estimating long-term costs is the timing of an eventual second line between Eugene and Medford. As noted in the DEIS, the construction date of a second line is highly speculative, with estimates ranging from some time in the 1990s to beyond the year 2000 (see p. 1-39). Such a great degree of uncertainty makes it very difficult, and probably inappropriate, to attempt to identify long-term costs. However, the cost of a second single-circuit line becomes progressively less expensive in present value terms as its completion date is advanced into the future. Unless it is assumed that the real costs of transmission line construction will increase rapidly, there appears to be little economic risk in single-circuit construction due to the much higher initial cost of the double circuit alternative.

Examples can be provided to support this conclusion. Advancing all 1986-1987 construction costs to the present, the current dollar cost of the Pacific portion of the double circuit alternative would be $109.7 million. This must be compared to an initial cost of $57.3 million for the Pacific portion of the draft preferred alternative, plus the present value of the future costs of a second line. Assuming no real increase in construction costs, the present value of a parallel line constructed after a seven-year lag (1993, in this case) would be $51 million at a discount rate of 3 percent, and about $32 million at a more realistic rate of 10 percent. Consequently, the probable long-term cost of two single circuit lines under these conditions would be about $89 million, versus $109.7 million for the double circuit alternative. Given this cost differential, it is questionable whether the Oregon Public Utilities Commission would approve the addition of the more costly alternative to Pacific's rate base. For this reason, the single-circit alternative is preferred.

27-2, 27-3, 27-4 See response to Common Issue No. 5. A more complete discussion of existing conditons is included in the FEIS. The project would be in compliance with state laws, and no activities or development are permitted within transmission rights-of-way.

27-5 The EIS text (p. 1-56) has been revised in response to this comment.

27-6 Adherence to the requirements of the Federal Land Policy and Management Act was discussed in the initial paragraph of the "Interrelationships" section of Chapter 1.

6/14/82

To - Mr. Ladd Sutton
U.S. Federal Building
211 East 7th Street
Eugene, Or 97401

28

From - Mr. John Hess
5278 Center Way
Eugene, Or 97405

Dear Mr. Sutton:

I will not be able to attend the June 17th meeting at the Eugene City Hall because of a business trip. This letter is to let you know that my wife and I are strongly opposed to the BPA's choice of route to construct these new 500 kV power lines. Our house is located within 1000 feet of the existing corridor. We do not wish to look out of our windows and see ugly 160 foot towers. We have a very nice house in an excellent area, and I'm sure that these towers would effect our property values. Would you want these towers in your back yard? I'm sure that you would not. We also enjoy a quiet neighborhood. We do not wish to hear the humming and cracking of these power lines which is compared to the noise level of light auto traffic 100 feet away. We also do not wish to have interference of television and radio reception. We would urge the BPA to select one of the other optional routes which would have little impact on population and perhaps be less expensive to construct. It really amazes us that if the BPA is so concerned about environmental impact, why have they chosen a route with the greatest impact on population? Don't ruin our South Hills area, select one of the optional routes. Please!

28-1

28-2

28-3

Sincerely,

John R. Hess

Response to comments in Letter 28:

28-1 See response to Common Issue No. 3.

28-2, 28-3 See response to Common Issue No. 5.

32

June 23, 1982

Bureau of Land Management
Oregon State Office
P.O. Box 2965
Portland, OR 97208

Gentlemen:

As a resident and taxpayer of both the City of Eugene and Lane County, I want to express my total opposition to the preferred alternative route for PP&L's 500 kilovolt powerline. This route across the South Hills of Eugene is completely contradictory to the position the city has taken over the years in terms of visual beauty and recreation for the community. The investment in dollars to this position speaks for the commitment.

The second alternative is also not acceptable. This route will blight the area it crosses and will have a detrimental effect on the quality of life of the surrounding residents.

The third alternative, the Alvey connection near Goshen, appears to be at least conditionally acceptable. Not only will the visual impact affect a reduced number of people, it will make more intensive use of already dedicated land. It is my understanding this route is also the least expensive and will adequately serve our needs for the foreseeable future.

The preferred and second alternatives address a projected need in the mid-1990's. The data used by BPA & PP&L seems to be wildly optimistic in terms of expected growth. If the growth does not meet their projection then the project described in the preferred and second alternatives is superfluous. The only thing accomplished would be the incursion of needless debt for the region. The third option at least reduces the expense and adopts a "wait and see" attitude which is more appropriate. 32-1

I urge BPA, PP&L, and the regulatory agencies to discard the preferred and second alternative routes and adopt the third alternative if in fact a need exists.

Sincerely,

David R. Pearsall
5369 Donald Street
Eugene, OR 97405

gem

Response to comments in Letter 32:

32-1 See response to Common Issues No. 2 and 4.

Metal Masters Inc.
3825 CRATER LAKE HIGHWAY · MEDFORD, OR 97501 · (503) 779-1049

June 22, 1982

Bureau of Land Management
Planning & Environmental Coordination Staff
Portland, Oregon 97208

Dear Sirs :

I am writing to express the strong objection of my husband and myself to the routing of the new 500 KV transmission line along the existing 230 KV corridor.

At the last meeting I was very surprised and offended at the many who expressed views for others. It would be grossly unfair for you to even consider those views valid.

Those views were that " the people living near the existing corridor are u ed to it" as though the 500 KV line would be the same. Another expressed view was " they moved there knowing it was there"

We did buy property several years ago knowing the 230 line was there approximately four hundred feet from the house we built and are living in but in no way is the existing line representative of the 500 KV line. Being used to it and liking it are not the same. The new 500 KV line will not blend into the woods as the wooden poles sort of do in the summer when the oaks are in leaf. It will be seen for many miles having adverse impact on much of the Medford area.

As for the tourists they will come. The many lines, traffic, smog, etc. in the Los Angeles area do not keep tourists from Disneyland and other attractions in that area. Thousands who vacation there often would not live there though .

The tourists willcome. Then they will go home.

Those of u living here will be here when they're gone. And the 500 KV line will be here polluting our landscape and sky every day.

I believe we need to protect our wildlife and wilderness. But wasn't much of the land our highways and homes are now on onetime wilderness?

Human life is more precious than anything else. The mental and physical well being of people must be considered above all else.

The route affecting the fewest people must be selected if indeed the new line has to be built.

The existing corridor does not only go thru White City (as if no one will be affected there) and Agate Desert. There are many more people living near the existing area than in the wilderness area routing thru Shady Cove.

Dirt bikes and four wheel rigs are a problem now. A wider corridor will be taken as an invi ation by even more of them.

Metal Masters Inc.
3825 CRATER LAKE HIGHWAY · MEDFORD, OR 97501 · (503) 779-1049

Peter Schmitz has suggested a route that would miss many of the homes and also keep it from the view of Medford. Will you please consider it] 33-1

But above all consider the people who live here and take the route that will affect the fewest people.

Very truly yours,

Severa Shipley

Sever a Shipley
Enc.
cc. Peter Sage
Jon Deason

P.S. Enclosed is alternate route suggested by Peter D. Schmitz

Response to comments in Letter 33:

33-1 See response to Comment No. 25-2.

524 Rock Creek Rd.
Gold Hill, Or. 97525
June 23, 1982

36

BLM
Planning and Environmental Co-ordinating Staff (935)
P.O. Box 2965
Portland, Or. 97208

I want it to be known here and now - I am opposed to the 500 KV line running through my property.

I know there are a lot of things in life that are important, but people are far more important.

I have to think of my family's welfare - my one son has already had two surgeries because of a hearing loss, I certainly don't need him exposed to the excessive noise that the 500 KV line will produce. 36-1

This property was bought to live on - out in the country - trying to get away from being dictated to as to what a person can do and can't do, and now you are trying your darndest to spoil all that.

If that line is so important to you find somewhere out away from people to put it, Not near to people that it will destroy the human race and deter from the beauty of God's land.

I am opposed to it running through my property 100%!

I would like to tell you where you could really stick that line, but I am trying to be nice, so won't.

Sincerely,
Josephine Bos
524 Rock Creek Rd.
Gold Hill, Or. 97525
(855-7063)

Response to comments in Letter 36:

36-1 See response to Common Issue No. 5.

Lane Council of Governments

THE PLAZA LEVEL, 99W/125 EIGHTH AVENUE EAST/EUGENE, OREGON 97401

L-COG Referral # 2E36
State PNRS # OR820 511-029-4
Type of Referral Draft EIS

REGIONAL CLEARINGHOUSE REVIEW AND COMMENT CONCLUSIONS

Telephone: 687-4283

Applicant Bureau of Land Management
Planning and Environmental
Coordination (9E5)
P.O. Box 2965, Portland, OR 97208

By: Gail Kelly
Clearinghouse Coordinator

Project Title: Eugene-Medford 500 kV
Transmission Line

Date: June 24, 1982

___ PNRS SUMMARY ___ FORMAL APPLICATION X OTHER

The L-COG Regional Clearinghouse has reviewed the proposed project for its relationship to existing plans, goals, or policies of this agency and finds the proposal to be:

- [ ] It is consistent with or contributes to areawide planning.
- [ ] Consistent, pending resolution of concerns noted in comments included.
- [ ] It is inconsistent with areawide planning.
- [ ] Request the opportunity to review the full application.
- [ ] No comment.
- [ ] Professional comments are included.

For A-95 Reviews Only:

- [ ] Recommend approval.
- [ ] Do not recommend approval.
- [x] Recommend approval, conditional on resolution of concerns included.
- [ ] No comment.

For Environmental Assessment (if attached):

- [ ] Negative declaration is consistent with information presented.
- [ ] Environmental assessment is adequate.
- [ ] Environmental assessment is not adequate for the following reasons.
- [ ] Impacts exceed established environmental standards referenced.

L-COG REVIEW COMMENTS

Please refer to the attached materials

Note: L-COG has received review comments from the following local agencies which have been incorporated into this summary:
Cottage Grove
Eugene

A-95 review comments should not be considered as a substitute of required permit or license procedures necessary for projects or programs. Nor does this review system waive regularly required performances standard reviews.

Copy to:
Kay Wilcox, State Clearinghouse

2E36

Cottage Grove recommends support. The City of Eugene submits the attached Resolution and letter from Mayor Keller to the BLM.

L-COG comments follow.

The electric load forecasts used in the EIS indicate annual average energy percentage growth rates of from 3.8 to 5.6 percent. More recent BPA forecasts indicate growth rates of 1.7 percent or less - substantially below those in the EIS. Given the prospects of continued wholesale rate increases by BPA (thus fostering price-induced conservation), impacts of both utility and local government conservation programs and a depressed local economy, the use of lower growth rates would seem justified. In fact, Eugene's (EWEB) electric usage has stabilized over the last few years. Consequently, BPA estimates that the Lane-Spencer link, Option A, will be needed by the mid-1990's seems highly unlikely. 38-1

The City of Eugene has made extensive efforts over the years to preserve the scenic quality of the South Hills ridgeline. Construction of Option A could significantly alter the visual impact of the ridgeline for many Eugene residents. The proposed transmission towers of Option A, at 160 feet in height, would be substantially higher and more visually obtrusive than the existing 100-foot towers. The EIS does not fully address the visual impact that the new towers would have on the city. 38-2

L-COG concurs with the Eugene comments and recommends that the Board, for the following reasons, support construction of the Alvey-Spencer link, Option C, and deferral of the Lane-Spencer link, Option A, until the need for that link is imminent.

1. Option C is needed in any event, regardless of whether Option A is constructed.

2. Construction of Option C, combined with decreasing growth in electric usage, may defer the need for Option A until after the year 2000.

3. Since Option A proposes to use existing right-of-way for the entire length, no development opportunities would be lost by deferral of the project.

Response to comments in Letter 38:

38-1 See response to Common Issue No. 2.

38-2 See response to Comment 12-3.

Siting Council:

June 25, 1982.

Attached to this letter is a petition in opposition to the existing power line corridor. I personally contacted and talked with 86 of my neighbors who are directly affected within 300 feet of the present 230 K.V. line.

The E.I.D. says only one home will be taken out !! looking personally at the route, this is a misstatement, at least 15 homes will be affected - and many out. Buildings. All people are concerned with ~~is~~ the environmental impact - and they will be about the same on both proposed routes, but the most important issue is the people involved. 39-1

The E.I.S. study reports 160 people on the existing route, and 24 on the preferred eastern route. P.P.L. in their answer to the County Commissioners Staff report — in direct opposition on almost every point, especially Mr. Soderberg study - emphatically endorse the eastern route. P.P.L. endorses the eastern route, cheaper to build, room for future expansion when another 500 K.V. line will be needed and has routed the line so it will not affect residences.

The existing corridor presently impacts 7 times as many people and in the future many more. The existing route passes through residential Dam's Valley, across the face of beautiful Table Rock Mt. then through populated White City, with its commercial and industrial zone, all to be in the expected growth pattern in the coming years.

Since the beginning of this expansion proposal through to day's decision by the County Commissioner there has been a feeling of politics involved. This should not be a factor to this decision. Common sense and reason for peoples needs should prevail.

Mr. Bill Parrott of Medford P.P.&L. in a discussion, stated that anybody who would fly over the two routes could only come to one logical conclusion - that the eastern route is the optimum route. It passes thru hills surrounding the Medford basin, routed to miss and pass 2,000 feet beyond buildings and have the least visual impact on the entire area and will accommodate future expansion when needed in a few years ahead.

We all love the trees and wild life and wish to conserve them - but the most important issue is people.

Please consider now and future years the impact on people in the Medford basin!!

As I see this decision, there is no question! logic and concern for peoples needs should be tantamount, the only sensible route, is the eastern route, it will now and in the future personally involve many, many less people.

Thank you,

Don Jellum
9100 Hwy 234
Gold Hill, Oregon
97525

503-855-9639.

DON JELLUM
9100 Highway 234
Gold Hill, Oregon 97525

Response to comments in Letter 39:

39-1 See responses to Common Issues No. 1 and 6. The DEIS acknowledges that many more homes are located along the existing corridor than along the draft preferred alternative. However, Options H and I would not require the removal of any houses.

40

United States Department of the Interior

NATIONAL PARK SERVICE

Pacific Northwest Region
Westin Building, Room 1920
2001 Sixth Avenue
Seattle, Washington 98121

IN REPLY REFER TO:

1201-03(PNR-RE)
Eugene-Medford 500-kV Line

June 29, 1982

Memorandum

To: Bureau of Land Management, Planning and Environmental Coordination Staff, Portland, Oregon

From: Acting Associate Regional Director, Recreation Resources and Professional Services, Pacific Northwest Region

Subject: Proposed Eugene-Medford 500-kV transmission line draft environmental impact statement

We generally agree with the summary conclusion regarding recreation that impacts of the line would be insignificant in most cases but would be significant in a few specific sites. Even though impacts may be characterized as "insignificant," they should be minimized to the extent practicable along the entire route. If an option is chosen where a line would pass through a park or recreation area, additional measures may also be required. If a recreation area was acquired or developed with financial assistance from the Land and Water Conservation Fund, replacement recreation land would be required. For additional information and details of this requirement, you should contact the Oregon State Liaison Officer: 40-1

David G. Talbot, Administrator
Oregon State Parks
525 Trade Street, S.E.
Salem, Oregon 97310

Surveys of cultural resources and proposed protection of any resources discovered during construction appear to be adequate.

Frederick J. Bender

Response to comments in Letter 40:

40-1 Should a Pacific power line pass through a State Park or designated recreational area, Pacific would contact the affected agencies. Should any problems arise, Pacific would try to mitigate them to the satisfaction of the parties involved. At present, Pacific cannot foresee any unsolvable problems concerning this power line.

ROBERT R. BENNETT
85334 South Willamette
Eugene, Oregon 97405

June 30, 1982

Bureau of Land Management
Planning and Environmental Coordination Staff (935)
Post Office Box 2965
Portland, Oregon 97208

Gentlemen:

This letter offers comments on the Draft Environmental Impact Statement for the Proposed Eugene-Medford 500 kV Transmission Line, dated May 1982.

In the last paragraph of Page S-9, it is stated that, "The effects of the proposed transmission line on ..... economic activity in the surrounding area would be insignificant, ...". This is not correct. The presence of a 500 kV line either in the Lane-Spencer corridor or along the Option B, Camas Swale-Twin Oaks route would have a major effect upon my business, as pointed out in the Appendix to this letter.

In the first paragraph of Page 3-82 we find, "Restoration of radio and television reception at residences and commercial establishments to the original level is a binding EFSC standard (OAR 345-80-055) with which Pacific and BPA would comply." First of all, it is not physically possible to restore radio reception at our facility with a 500 kV line present at either of the two locations referenced above.

Secondly, numerous conversations with BPA representatives since the appearance of the draft EIS have made it abundantly clear that BPA hasn't the slightest intention of complying with EFSC requirements. BPA has informed me that they have an ongoing policy of attempting to restore damaged services. But this has clearly been stated to be "out of the goodness of our hearts", and not in response to any formal requirement. Furthermore, it is my distinct impression that there is a dollar limit of about $2 to any efforts they would make.

It is obvious that the EFSC standards were designed to give just the kind of protection needed by small businesses such as mine. Otherwise, the nearby commercial business who suffers the sudden economic damage resulting from the appearance of an environmentally hostile energy facility is left to experience, at best, a costly legal battle.

In Appendix A of the draft EIS, on Page 5 of the PP&L letter dated October 23, 1981, it is stated that, "Pacific will restore the reception of radio and television at residences and commercial establishments in the primary reception area to the level present prior to operation of the line. This restoration will occur at no cost to residents ....." Again, this is not always physically possible. However, as in our case, it is at least possible, (and indeed should be required) to compensate financially, by providing for the cost of an alternative combination of equipment, facilities, and travel.

We believe our business can readjust to the presence of the 500 kV line along the proposed routes, provided we receive adequate compensation. We would like to propose, therefore, that such requirements be clearly stated in the final version of the EIS.

Yours truly,

Robert R. Bennett

APPENDIX

This appendix covers the background and status relating to the operation of a commercial business which would suffer from the presence of a 500 kV line in the immediate vicinity.

In 1962 and 1963 surveys of the Eugene and Springfield areas were conducted with regard to possible locations for a research and development laboratory involved in the design, development, and testing of very sensitive electronic devices and systems. At that time, field strength measurements were made, and considerable written and verbal coordination was effected with BPA. While there could be no promises as to any ultimate BPA services in the area, the outlook for minimal electromagnetic interference seemed hopeful for an indefinite period.

As a result of those surveys, a decision was made to locate a facility at 85334 South Willamette Street, Eugene. That was deemed compatible, though marginally so, with the then-existing BPA 230 kV line which interconnects Alvey and Lane. Our facility is approximately 1 mile south of where that line crosses South Willamette Street.

The facility was completed and made operational in late 1966. Since that time it has served the needs of numerous industrial and government clients. In thst period of over 15 years, we have experienced almost no serious increase in harmful electromagnetic environment. The incresse in power output by KVAL, on VHF channel 13, has been a problem. However, we have been able to schedule some activities for the early morning hours when their transmitter is off the air. We have also had to contend with KPNW, a high power AM station located approximately 5 miles east of here. Here also, the reasonably well defined signature of their transmitter has caused a minimum of inconvenience to us.

The electromagnetic interference caused by nearby high voltage transmission lines is of a more insidious nature. The impingement of that interference on low level circuitry is aggravated by its wide bandwidth and its 24-hour continuous duration. As will be pointed out later, the high energy levels in the low and very low radio frequencies are particularly damaging to our activities.

All sources of interference in the immediate vicinity of our laboratory are well controlled. Primary power service runs underground for approximately 1000 feet. Special wiring is used in the buildings. Provision has been made for eliminating fluorescent lights and solid-state power devices which are potentially troublesome. Using such techniques, we have been able to proceed without needing recourse to shielded rooms. In looking ahead to the possibility of additional noise from a 500 kV line, we could at least partially offset such noise by the addition of shielded rooms. Of course, we would not wish to incur any expense for such facility modifications. Furthermore, such rooms are only effective for work which is "self contained" and does not relate to signals received from outside sources.

Unfortunately, we depend heavily on outside signals for the conduct of our business, and even a shielded room would not be helpful in those cases. The primary radio services involved are OMEGA, at approximately 10 kHz, the Bureau of Standards WWVB radio service at 60 kHz, and the U. S. Coast Guard LORAN-C radio service at 100 kHz. To a lesser degree, we use services at 5, 10 and 15 MHz. Thus we are concerned with any interference in the spectral region from 10 kHz through 15 MHz.

By precedent, we have learned to live compatibly with the BPA 230 KV line at a distance of 1 mile. As an estimate, the required clearance of a 500 kV line would be of the order of 5 miles, which makes either the Lane-Spencer or Option B, the Twin Oaks-Camas Swale routes incompatible.

Preliminary analysis of the effect of having a 500 kV line closer than 5 miles has led to estimates of the cost of alternate operations at this location, with additional equipment and more expensive operational procedures. In addition, there would need to be travel to a more remote facility and the purchase or rent of such facilities, together with the installation of some equipment at those locations.

Preliminary estimates for such partially compensating measures, based on 1982 dollars, range from $100,000 to $200,000 for the equipment, rent and travel.

Response to comments in Letter 41:

See response to Common Issue No. 5. BPA personnel are working with the commentor to investigate and resolve his claims, due to the highly technical and site-specific nature of the stated problem. The new preferred alternative route (Option C) would be located more than five miles from the commentor's business, and should have no effect on his operations.

24 June 1982

This is a short note in reference to the 500-kv line that has been planned from Medford to Eugene.

I recently attended the hearing in Eugene concerning the portion of the line to run from Goshen to points West across the South Hills within 1000 feet of my residence. The present 230-kv line is at this time a complete noise nuisense. Being a Amateur Radio operator I have had to put up with noise from this line for 12 years especially during the rainey periods. Your statements concerning clearing up noise for TV if the 500-kv line was put in are pure lies. I have been in the communications business for more than 30 years. I have in the past put up with high voltage lines and have been told the same old lies. You can not clear up that much noise. 42-1

Also being a pilot, those 160 foot towers are a clear violation of FAA rules for height above ground towers. I did not see in any of your letters anything about this. 42-2

The cost is another subject. One sixth of this town has gone. How in the world can any orginaization plan on spending that much of the taxpayers money when this 500-kv line is not needed now or in the next ten years or if ever. It is the same old game with the oil companies, energy companies and the federal government. Take, Take, Take until there is nothing more to take from the people who pay the bills that are so grossly overflated from a bunch of bureaocrats such as the BPA. The public is being lied to about all kinds of energy and it starts right in the White House.

Until this country (big federal bureaocrates) no longer rips off the public with high electric rates, high fuel, high taxes (for nothing), the country is going to continue to decline. The BPA with WPPSS and the Nuclear system are going to break us all. Terribly poor management is the one thing that will do us all in. You are all a disgrace to this country.

Marvin C WINES

M. C. Wines
86232 Lorane Highway
Eugene, Oregon 97405

Response to comments in Letter 42:

42-1 See response to Common Issue No. 5.

42-2 Airport Advisory circular No. 70/7460-20 explains the criteria for notifying the F.A.A. when construction or alteration of objects may affect navigable airspace. The only two criteria mentioned in this publication that affect this project are: 1) A proposed object that exceeds two hundred feet in height at the ground level. 2) An object that would be within 20,000 feet of an airport with at least one runway more than 3200 feet in length; and would exceed one foot in height for each 100 feet (100:1) horizontally from the nearest point of the nearest runway.

Since the proposed tower heights are expected to be below 200' in height and the nearest airport is over 20,000' from the northern terminus of this line, notification to the F.A.A. would not be required in the Eugene area.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Area Office
2625 Parkmont Lane, S.W.
Olympia, WA 98502

MEMORANDUM

June 30, 1982

TO: Chief, Division of Resources, BLM, Portland, OR

FROM: Area Manager, FWS, Olympia, WA

SUBJECT: Review of Biological Assessment and Draft Environmental Impact Statement for Pacific Power and Light Company Transmission Corridor: Eugene to Medford 500 kV Power Line.

REF: 1-3-82-I-541 and 1-3-81-SP-48

We have reviewed the subject document per your request and offer the following comments.

Endangered and Threatened Species

Implementation of Option D (Scenic Right-of-Way Realignment) would adversely affect the Columbian white-tailed deer, a species federally listed as endangered throughout its range. This segment of the proposed powerline would pass through the principal fawning area for this species along the North Umpqua River northeast of Roseburg, Oregon. Section 7 of the Endangered Species Act of 1973, 16 U.S.C. 1531, et. seq. requires formal consultation with this Service if a federal action would adversely affect any listed species. This effect, as well as the need to consult, could be eliminated by dropping Option D from the proposed project. Mitigative measures such as: right-of-way maintenance restrictions, realignment of set-back pads, construction timing restrictions, and access restrictions, could possibly eliminate adverse effects. We are available to consult informally with you to determine the need for formal consultation if you pursue mitigative measures. Otherwise, we recommend that you request formal consultation with this office if you choose to implement the proposed Option D. Use of the existing right-of-way would have no adverse impact on this species. 43-1

Other Fish and Wildlife Resources

Aside from the comments above on Option D, we find that the proposed project will not have a significant adverse impact on fish and wildlife resources.

The Fisn and Wildlife Service endorses the placement of transmission lines in existing corridors, as proposed in this project. We also concur with the concrete pads and steel structures being set back from wetland areas and stream corridors.

Additional mitigative measures concerning the displacement of wildlife through habitat reduction, erosion and sediment control, and migratory bird and raptor protection through powerline and pole design were addressed in the DEIS. The Service encourages the implementation of these measures.

Thank you for the opportunity to comment on the proposed project.

Margaret T. Kolar
for Joseph R. Blum
Area Manager

cc: RO, AFA-SE
ES, Portland
SE, Portland
ODFW, Non-Game Program Coordinator
ODFW, Ron Bartels

Response to comments in Letter 43:

43-1 Option D is not included as part of the proposed action.

Michael Strooband
5115 Solar Heights
Eugene, OR

45

July 1, 1982

Bureau of Land Management
Oregon State Office
P.O. Box 2965
Portland, OR 97208

Re: BPA/PP&L
500kV powerline - Eugene, Oregon

Gentlemen:

I am a resident of the city of Eugene, and specifically reside in the South Hills. I have studied the EIS with respect to the 500kV powerline which has a Preferred Route going through the South Hills of Eugene.

From the discussion brought forth at the hearing held in Eugene on June 17, 1982, and from the various articles with respect to this matter, it appears that there is only the Preferred Route and two alternatives. I fail to see why other suggested alternatives have not been proposed that would avoid substantial populated areas to make the necessary connection with the Lane substation. Even assuming that there were only three alternatives, the Preferred Alternative appears to be the worst place of the three. The arguments which have been proposed to support the Preferred Alternative make little, if any, sense. For instance, it does not make sense to establish a significant powerline through the South Hills for a "projected" power need some 15 to 20 years down the line. While I am not against future planning, I do not understand why that size powerline need to affect a designated residential/recreational area, such as the South Hills. Furthermore, such a route fails to take into consideration the technology which will be existing in 15 or 20 years with respect to power needs in the Eugene metropolitan area. 45-1

It would appear to me that of the three stated alternatives, Alternative C is the best solution to the present problem. Not only does this alternative affect little, if any, residential areas, but it is the least expensive by a considerable

margin. If for some reason Alternative C could not be accomplished, then it would appear that a modified version of Alternative B would also be a better solution than the Preferred Alternative. By reference to a modified version of Alternative B I would suggest that the line from Camas Swale Creek be extended in a generally northwest direction to the Lane substation instead of the projected northern route up to the Twin Oaks. A modification of Alternative B would appear to affect fewer individuals than the Alternative B. 45-2

It would appear to me that the most compelling reason for objecting to the Preferred Alternative is because of its significant impact to the City of Eugene. The South Hills area represents a vast area for future residential growth in Eugene. The South Hills skyline is an important factor to all residents of Eugene and should be preserved. I submit that placing 160' towers along the Preferred Alternative would virtually ruin the skyline of the South Hills. Moreover, the Spencer Butte area has been preserved by the City as a natural recreation area. The Preferred Alternative would destroy the asthetic quality and the recreational aspects presently existing at Spencer Butte.

I hope the powers that be will give more consideration to the establishment of the 500kV powerline with respect to the Eugene metropolitan area.

Very truly yours,

Michael Strooband

MS:jr

Response to comments in Letter 45:

45-1 A routing study covering the Eugene and Medford areas was conducted prior to the identification of alternatives and the preparation of the DEIS. The Routing Study Report, which was released to the public prior to release of the DEIS, addresses the consideration of alternative routes to Lane Substation and the selection of those routes analyzed in the DEIS.

45-2 The identification and selection of routing options for the Eugene area has been addressed in the Routing Study Report, as described above. These options were analyzed thoroughly in the DEIS and in the site certification process of the Oregon Energy Facility Siting Council (EFSC). Modification of any route at this time would not be acceptable in the EFSC process.

COMMENTS ON THE MAY 1982 DRAFT ENVIRONMENTAL IMPACT STATEMENT ON THE PROPOSED EUGENE-MEDFORD 500 kV LINE

Chris Attneave
85328 Willamette
Eugene, Oregon 97405

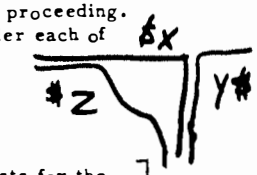
(The following comments are not intended to apply to any parts of the DEIS dealing with the line south of Creswell. I am not familiar with the area south of Creswell and have not looked at the treatment of any part of the line in the DEIS other than the very northern end.)

On the whole, the DEIS appears to be well written and fairly well constructed considering the length and complexity of the project and the alternatives. Without suggesting that the final EIS should be a revision including all these suggestions, I offer some ideas that might simplify presentation of some future project of this sort.

For the reader who is interested in alternative routes, it is very frustrating to be presented with the great variety of maps in the routing study and to have the alternate route (B) appear only on the one containing the countour lines. The alternative route should have appeared on each of the maps or the document should have included a transparency that could be superimposed on each one so that the reader could tell where the route crossed major roads, etc.

On the subject of maps, it would have been good to have a more detailed map of the Eugene area and one that showed up to date city boundaries.

I'm not sure how the naming of alternatives and options in the Eugene area could have been simplified but the system used clearly led to a certain amount of confusion in the hearing and the EFSC proceeding. Perhaps a page of small maps with a brief summary under each of the combination pictured would present this visually.



I would think the same technique might have been used to present the data on costs more simply.

On the matter of costs, it appears that the mitigation costs for the BPA portion of the Eugene line were not included in the table on costs and this definitely should be remedied since it appears to be a fairly sizeable item. I am referring to visual mitigation. I am not clear as to whether the restoration of radio and TV reception is included in the BPA figures or not. 116-1

The count of houses and apartments at the north end appears to be in error and should be corrected but it should also be adjusted to take some notice of the number of additional residence units that are projected for the life of the project within the area considered. Certainly this is not a difficult calculation for the portion within the urban service boundary of Eugene. 116-2

I am not sure that the analysis of residences within the 1000 foot distances is sufficient to judge the impact of such a line. Had the "viewsheds" been analyzed for the Eugene area, I think it would have been clear that the new taller towers (both wooden and steel) and the associated conductors would be significant features in the views from a great many more residences and streets in S. Eugene than the 1000 foot analysis suggests. It does not seem to me to make sense to agonize over the possible view of a tower against the skyline and not to be bothered by the fact that many people must look at one or more of the towers (or even a whole cleared corridor with multiple towers and access roads) as the most significant object in their view every day of their lives. 116-3

I would have preferred to see a more detailed analysis of the views from Spencer Butte Park which is the most frequently used viewing area in this part of Lane County. The existing corridor and nearby towers (though not the few closest ones) are clearly visible and doubling tower heights, adding more conductors, and widening the right of way swath from Twin Oaks west will make the powerline even more obvious. It is already the single most signfficant manmade feature visible from the Butte.

It is puzzling to find that there is such concern for the crossing of a trail used by hikers and much less attention given to the very much larger number of persons who would be traveling the major roads that intersect the line. Traffic counts for Dillard, Fox Hollow, Willamette, Lorane, Gimple Hill, Bailey Hill, Crow Road, McBeth and Fox Hollow (where B crosses), and for the city streets within Eugene could be obtained from the local traffic depts.

One could argue that persons travelling these roads regularly would become adapted to the powerline and wouldn't notice it as much as the occasional hiker, but all of these roads are much used for short drives by Eugene residents and by hikers and joggers.

The figures on pages 1-12 and 1-13 should be from the same perspective. By reversing one or the other, S and N would be either on the left of the and the two would be less confusing.

Finally, since forecasting is such a difficult task the least one can ask is that the most recent forecasts be used. This would certainly require use of the current BPA forecast (which more nearly approaches the Oregon Dept. of Energy forecast), if not the consultant's report which suggests that a 1.2% growth rate might be even more appropriate than the BPA number of 1.7%! 116-4

This is important for two reasons: It affects the timing of the line and it affects the calculation of the costs. Where the agency preferred alternative involves the admittedly more expensive route for something that is being done many years in advance of the need (even using the earlier higher forecasts as a basis), it would be appropriate to include in the cost estimates by which the alternatives are compared some recognition of the cost of money that would be involved when something is constructed before it is really needed (BPA borrows money for construction at a little more than the prevailing rate for Treasury bills and this is considerably more than the rate of inflation. While it is true that steel prices have risen rather sharply recently, they had not been rising for many years as much as other things and there is no reason to suppose that the prices involved would begin to outrun either inflation or the Treasury bills.) 116-5

Chris Ottenare
June 6, 1982

Response to comments in Letter 116:

116-1 The mitigation measures identified on p. 1-51 of the DEIS are potential measures that have not yet been adopted. If any of these measures are adopted, they would then become a part of the proposed action and would be included in project costs. If public comment or subsequent analysis results in a determination to incorporate any of the mitigation measures, this will be reflected in the Record of Decision along with any measures considered but not adopted. The Record of Decision will discuss costs associated with mitigation, such as the cost figures identified in the DEIS.

116-2 See responses to Common Issues No. 1 and 6.

116-3 The assessment of visual impacts was not limited to only those impacts within 1,000 feet of the proposed line. For elaboration on the breadth of the visual analysis and the significance of the 1,000 foot zone, refer to the responses to Letters 12 and 16 and Common Issue No. 5.

116-4 See response to Common Issue No. 2.

116-5 BPA project costs include interest during construction, but this is not a separable cost item that needs to be analyzed for any particular alternative or option. The cost comparisons in the DEIS treated all of the alternatives and options on an equal, constant-dollar basis. Regardless of which terminal link (Lane-Spencer or Alvey-Spencer) were constructed in the 1980s, that link would not remain unused for several years but rather would contribute immediately to system reliability and efficiency as well as supply power to Pacific. Construction of the Lane-Spencer link in the 1980s would not be analogous to the situation of an idle revenue-producing facility (such as a powerplant) against which recurring capital charges must be levied.

BUREAU OF LAND MANAGEMENT
Planning & Environmental Cordination Staff
P.O. Box 2965
Portland, OR 97208

Re: BPA 500 kv line Goshen to Lane

Gentlemen:

I am asking you to reconsider your routing of the 500 kv line that you are considering from the proposed PP&L line to the Lane Station of W 11th for the following reasons:

1. Is this 500 kv line needed now? You say it will be needed by the mid 1990's . That is 10 years away based upon anticipated population growth in a study done two years ago. As you must realize, your study is outdated because we now have zero population growth, and power demands due to conservation will be much less in the future. 117-1

2. Within 10 years there may be alternate energy sources and no line needed.

3. Why are you even considering the preferred route from Goshen to Lane Station since it cost $8,000,000. more?? With the cost of money in todays market, the interest alone on the extra $8,000.000. is astronomical.

4. The environmental impact on people living along the corridor for this line from Goshen to Lane is considerable --
   a. Visual - there is no way to hide a 160' high power pole. 117-2
   b. Health - studies show that long-term exposure to electrical and magnetic fields constitute a health hazard. 117-3
   c. Noise - crackling and humming noises produced by crona
   d. Radio and TV reception problems

5. Population on your "Option C" route is zero, while along your Preferred route there are 408 homes or apartments according to your impact statement, and I'm sure there are alot of homes that you missed counting because they are hidden in the trees. Why then are you even considering subjecting all these people to the affects of the Preferred Route when you have an alternate route with no population. 117-4

BPA 500 kv line - Goshen to Lane

The Honorable James Weaver's representative testified that there was no need for another line into Southern Oregon because one had just been completed East of the Cascades.

Please reconsider your options, and if you think you must build the line into Medford, please use your Option C (Alvey to Spencer) because it is cheaper to build and would not affect one residence.

Thank you for your consideration.

Sincerely,

Evelyn Nelson

P.S I'm against the line from Spencer to Lane station — and I still haven't been paid for the last time that Bonneville put a pole on my property!!

Response to comments in Letter 117:

117-1 See responses to Common Issues No. 2 and 4.

117-2 See responses to Letters 12 and 16. The DEIS acknowledges that the proposed line would be larger and more visible than the existing line.

117-3 See response to Common Issue No. 5.

117-4 See response to Common Issue No. 1.

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE

SEATTLE, WASHINGTON 98101

120

REPLY TO ATTN OF: M/S 443

JUL 3 1982

William G. Leavell
Oregon State Director
Bureau of Land Management
P. O. Box 2965
Portland, Oregon 97808

Attn: Planning and Environmental Coordination Staff

Dear Mr. Leavell:

RE: Proposed Eugene-Medford 500 KV Transmission Line Draft EIS

The Region 10 office of EPA has reviewed the subject Draft EIS. From a technical standpoint, it appears to be a fairly thorough and accurate document. Calculations of sediment yield seem reasonable, indicating significant short-term (3 to 10 years) water quality impacts in several rivers and streams in southern Oregon. It is difficult, however, to evaluate the severity of these impacts without a discussion of the beneficial uses of the water bodies that would be most significantly affected. Important fisheries, recreational rivers and streams and agricultural, domestic or industrial water uses in the high erosion areas should be presented in the Final EIS along with specific mitigation measures which could minimize impacts in these critical areas. Such measures could include minimizing vegetation removal, seasonal construction practices, riprap, jute netting, catchment basins or intensive revegetation efforts (e.g., soil replacement). 120-1 120-2

EPA has rated this DEIS LO-2 (LO - lack of objections; 2 = insufficient information). This rating will be published in the Federal Register in accordance with EPA's responsibility under section 309 of the Clean Air Act to inform the public of EPA's views on major Federal actions. If you would like to discuss EPA's comments with us, please contact Mr. Richard R. Thiel, Chief, Environmental Evaluation Branch at FTS 399-1728.

Sincerely,

John R. Spencer
Regional Administrator

Response to comments in Letter 120:

120-1, 120-2 The DEIS discussion of water resource impacts contained an implication that was unintended. On page 3-10, the DEIS identified several streams along which there would be a parallel section of transmission line. The mistaken implication from the previous sentence was that all of these areas were high erosion hazard areas. The proper statement is that these areas have greater potential for sedimentation due to the proximity and orientation of the line, but they are not all areas of high erosion. The EIS text has been revised accordingly (see page 3-10). As originally described in the DEIS, the area of concern is the granitic soils area in the drainage of West Fork Evans Creek. Water uses, fishery resources, expected problems, and mitigation measures for this area were described in several sections in the DEIS.

Bureau of Land Management
Planning and Environmental Coordination
Staff (935)
P.O. Box 2965
Portland, OR 97208

July 14, 1982

Re: Proposed routing of 500KV powerline through south Eugene

Dear BLM Staff:

We are writing to protest BLM and Bonneville Power Administration plans to construct a 500 kilovolt power transmission line through the existing corridor that passes our house in south Eugene near Spencer Butte. Routing of the line through south Eugene would be aesthetically objectionable and incompatible with the residential environment of south Eugene and would cause a loss in property value to those owning homes near the line. In addition, the line would make noise that would cause a loss in health and welfare benefits to those living in proximity to the proposed line.

In attempt to determine the loss of benefits we would incur as a result of the routing of the line near our home we have estimated the cost in reduced property value and reduced health and welfare benefits explicitly in dollars over a thirty year period. If BLM and BPA/PPL carry out plans to construct this line, we would attempt to join with others in a class action suit demanding payment in compensation for our losses. The results of our analysis, using relatively standard application of cost/benefit analysis, are presented below.

Loss in property value - We estimate the loss in property value to be considerable because our home is very close to the proposed line route. Our estimate is a 15% reduction in property value. The true market value of our home, based on the most recent assessment, is $95,600. The one-year cost in 1982 dollars would be approximately $14,340 if we were to sell our home immediately. However, this one-time cost would not comprise our total loss. Assuming that either we would live in the house for a period of thirty years or that any buyer would anticipate buying and financing the house over this period of time, the loss in appreciation also must be estimated and adjusted in future dollars. If we assume that the value of our property would increase at an annual rate of eight percent over the next thirty years, a conservative estimate of the compound increase considering the volatile nature of real estate prices over the long-term, and that our loss in appreciation would be fifteen percent of this, the total future loss is approximately $20,300, assuming a five percent discount rate on the value of the dollar. Thus, the total loss in real estate value, combining the immediate loss in value plus loss in future value we estimate at approximately $34,640. We believe that this is a conservative estimate using our methodology, and that a higher loss figure would result using more sophisticated loss estimation methods.] 121-1

Loss in health and welfare benefits - The power line would emit a hum noise that constitutes noise pollution, which not only reduces property values but causes stress and personal irritation. Recent studies in the the fields of psychology and medicine indicate the relationships between noise pollution and stress, and further between stress and a variety of health problems. Not the least of these is reduced resistance in general to disease and increased probability of heart disease, cancer and other health disorders. While we recognize that there are a multitude of stressors in our environment, acknowledging that our neighborhood at present is very quiet and provides a highly restful environment we estimate that the marginal loss in health and welfare that would result from the line noise would be approximately $100 per person per month. This results in $4800 per year for our family of four. This would equal about $144,000 in 1982 dollars over a thirty year period, or as much as $650,000 in constant dollars estimating a five percent loss annually in dollar value (using the consumer price index as a standard for example).] 121-2

Additional losses - Additional losses are likely to result that we have not attempted to cost out here. Among these are increased health and safety risk due to proximity of the line and interference with radio and television signal transmission.

Total loss - A minimum estimate of total loss we will incur if the line is routed near our home is $19,160 immediately and from a low estimate of $178,640 to approximately $684,000 as a high estimate over a thirty year period using only the preliminary estimates of loss rendered here. Other loss factors are likely to be found in a more thorough analysis. If losses were calculated at only $30,000 per four person family, a low estimate given our analysis, and this figure were multiplied times the approximately 2800 persons (or more, considering the potential for growth in south Eugene) that would sustain losses from line routing, a total loss figure is approximately $21 million, a considerable sum. And we stress that this is only a conservative estimate of one-time loss. The total loss in benefits to this group over time could be calculated at approximately $125 million or more (700 person/families x $178,000 loss).

We hope that you consider these arguments in your environmental impact and cost/benefit analyses of the alternative routes for the proposed power line. Of course, you are required to do this, but it would also be prudent to consider the full costs in anticipation of legal action to block the south Eugene route, which would add in some measure to the routing and construction costs. It seems highly likely that such legal action would result on behalf of south Eugene residents should the decision to route the line through this residential neighborhood be made. This is made even more likely be the fact that residents in this area are well above average income earners and as relatively well-educated citizens are more likely to be activist and to seek legal assistance. These factors should be considered under the political feasibility cost element of your cost/benefit analysis. Despite the tone of this letter we do not approach BLM or BPA/PPL as adversaries in this matter or in general. We appreciate the valuable role that these organizations play in providing power to residents of the northwest. Thank you.

Sincerely,

Larry R. & Cynthia L. Jones
5340 Saratoga Street
Eugene, Oregon 97405

cc: Peter Johnson, Administrator, BPA

Michael Gleason, City Manager, Eugene

Response to comments in Letter 121:

121-1 See response to Common Issue No. 3.

121-2 See response to Common Issue No. 5. Further, the loss estimate is subject to several flaws. The commenters do not identify the distance to the existing corridor from their home. Noise from the proposed line would be noticeable only if the separation would be about 300 feet or less, and then only outdoors or next to open windows. Consequently, it is not clear that the commenters would be affected, particularly to the magnitude indicated. Research is currently being conducted on the effects of transmission line noise on people, but these effects have not yet been defined, let alone quantified in dollar terms. The claim of monetary losses due to stress from noise is also inconsistent with economic theory concerning willingness to pay for amenities. The claimed loss of $100 per person per month treats both willingness and ability to pay as equal between children and adults, and the aggregate annual loss of $4,800 reflects either an extremely large family income or inherent bias in estimating the loss. In both cases, willingness to pay for or retain an amenity (quiet) must bear a reasonable relationship to ability to pay (income). Finally, the commenters neglected to discount the claimed health and welfare losses back to the present, as they did with the property value example.

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August 6, 1982

Bureau of Land Management
Planning & Environmental
Coordination Staff (935)
P.O. Box 2965
Portland, OR 97208

Re: Draft Environmental Impact Statement, Proposed Eugene-Medford 500 kV Transmission Line (May, 1982)

Dear Sirs:

This law firm represents the individuals and groups listed on Exhibit "A," attached to this letter. These comments are being submitted on their behalf. At the outset, we wish to thank you for the opportunity to present our views.

SECTION I -- INTRODUCTION

Our clients are primarily concerned with, and our comments focus on, the portion of the project which lies in Lane County. Our clients oppose the construction of the Preferred Alternative, Option A, or Option B. Our clients do not oppose the construction of Option C as a means of connecting the proposed PP&L line to an existing 500 kV line in the Eugene area.

Construction of Option C would accomplish the project purpose of connecting with an existing 500 kV line and could be accomplished at much less cost and with fewer adverse environmental effects than either the Preferred Alternative, Option A, or Option B. We request that you reject the Preferred Alternative, Option A, and Option B, and instead select Option C to accomplish the Eugene connection.

The Draft Environmental Impact Statement (hereafter DEIS) suffers from numerous inadequacies. Many, though not all, deficiencies arise from a single source, namely, poorly defining the scope and purpose of the statement before it was prepared. The DEIS attempts to combine two different projects. One project is PP&L's proposal to construct a line from Eugene to Medford. The second proposed project is BPA's proposal to construct a "reliability loop"around Eugene. If holding down costs and adverse environmental effects were the criteria for routing the BPA segment, Option C is clearly preferable. Instead, BPA chooses the Preferred Alternative. The justification given is that of "reliability." The DEIS reveals that reliability can only be achieved by completing a "loop" line of 500 kV lines around Eugene.

Thus the DEIS has a hidden agenda, namely, completing as much of the 500 kV loop around Eugene as possible as soon as possible. The DEIS never admits this fact. As a result, it ignores the issues and facts that it ought to address. If the BPA project is designed primarily to increase "reliability," the DEIS should study in detail the figures on which the projected need for the increased reliability is based. Likewise, the DEIS should examine other possible means of satisfying the purported need for increasing reliability. As it stands, the DEIS assumes the need for a loop line and fails to examine alternatives for satisfying that need other than the Preferred Alternative and Options A, B, and C. Basically, BPA is proposing to construct the Preferred Alternative

(or Option B) now and Option C later. In other words, the "alternatives" listed in the DEIS are not really alternatives at all.

In summary, the DEIS combines two very different projects to satisfy two very different needs in one DEIS. As a result, the portion of the DEIS covering the BPA line was poorly conceived and poorly executed. The DEIS is seriously inadequate and needs substantial revision. Those inadequacies are discussed in detail below.

SECTION III -- NEED

THERE IS NO NEED AT THIS TIME FOR THE PROPOSED BPA 500 kV TRANSMISSION LINE TO THE LANE SUBSTATION.

The statement, at page 1-3 of the DEIS, that "BPA load growth projections indicate a potential problem with the reliability of service in the Eugene area in the mid-1990's" is grossly overstated based upon BPA's and PNUCC's most recent load growth projections.

A. BPA's Own Most Recent Need Projections Contradict the DEIS.

BPA's own most recent forecast of annual average energy percentage growth rates for the Pacific Northwest projects less than one-half (1/2) the growth rates assumed in the DEIS. The 122-1
projected mid-1990's "reliability need" stated in the DEIS (pp. 1-3; 1-4), assumes an annual average energy percentage growth rate ranging from 3.8 percent to 5.6 percent. (DEIS at p. 1-1.) This assumed growth must now be compared with BPA's most recent April, 1982, "Forecasts of Electricity Consumption". These most recent BPA forecasts project total annual average load growth in the Pacific Northwest region over the next 20 years at 1.7 percent, less than one-half (1/2) the annual growth rate assumed in the DEIS. (Bonneville Power Administration Forecasts of Electricity Consumption in the Pacific Northwest, 1980-2000, April, 1982, at p. 5.) Only considering, average percentage growth for the next ten years, the most recent BPA forecast is 1.6 percent annual growth! (BPA Forecasts, 1980-2000, April, 182, at p. 5.)

Based on the most recent BPA forecasts of 1.7 percent annual average load growth for the next 20 years (but otherwise using assumptions found in the DEIS), BPA's "reliability need" in the Eugene area cannot reasonably be assumed to accrue before the year 2010. Building a connecting line to the Lane Substation in the mid-1980's to fulfill a "reliability need" that may or may not accrue well beyond the turn of the century cannot now be justified. From a system standpoint, the proposed Eugene to Medford 500 kV transmission line's primary project purpose can be fulfilled by BPA's simply constructing the identified Option C (Spencer to Alvey) route. (Routing Study at p. 4-1.) This construction along the identified Option C route will satisfy the need for the Eugene to Medford 500 kV transmission line project, (DEIS at pp. 1-21, S-5) and do so at a cost approximately nine million dollars less than BPA's proposed connection to the Lane Substation. (DEIS p. 1-21.)

B. PNUCC's Most Recent Need Projections Also Contradict the DEIS. 122-2

The Pacific Northwest Utilities Conference Committee's most recent forecasts of annual average percentage growth rates for the Northwest region are also approximately one-half (1/2) those of the growth rates assumed in the DEIS. In summary, the PNUCC 1982 Northwest Regional/Sum-of-Utilities Forecast shows a twenty year median growth rate of 2.5 percent, with the PNUCC econometric model cross check at 2.1 percent. (PNUCC Press Release, May 13, 1982.) Additionally, it has been noted by the General Accounting

Office that such PNUCC forecasts are generally too high. (U.S. Comptroller General, Review of Peaking Power Needs in the Pacific Northwest, Rep. No. EMD-80-46, at 8-9, January 4, 1980.) Given these updated forecasts of annual average load growth rates for the Pacific Northwest, the DEIS load growth projections and the assumed "reliability need" for a BPA 500 kV transmission line to the Lane Substation in the mid-1990's must be revised and reassessed to ensure that the DEIS reflects accurate information.

C. The Proposed BPA 500 kV Transmission Line to the Lane Substation Is Not "Needed" Under Oregon Energy Facility Siting Council Standards for the Siting of Transmission Lines. 122-3

The Federal Land Policy Management Act, 43 USC §1765(a), Intergovernmental Cooperation Act, 42 USCA §4231(c), recent case law, and the State of Oregon's maximum jurisdiction policy for the siting of all 500 kV transmission lines in Oregon, ORS 469.300(10)(c) and ORS 469.310, require BPA, to the "maximum extent possible", to comply with the Oregon Energy Facility Siting Council's substantive transmission line siting standards.

One of these EFSC substantive standards is the "Need for Facility" standard. OAR 345-80-043. Under this standard, a facility must be found to be both "needed" and to be a "prudent" method of meeting such need. Applying this "Need for Facility" standard to the proposed BPA 500 kV transmission line to the Lane Substation, the "need" aspect of this standard is not met as:

(1) The BPA line will not be required within five years to carry peak demands in the Eugene service area (DEIS 1-3, 1-4, and discussion above);

(2) There is already one transmission line greater than 230 kilovolts supplying energy to the Eugene service area (Routing Study, p. 4-1); and

(3) There has been no showing that the proposed routing to the Lane Substation will serve conservation purposes.

"Prudent" is defined for purposes of this "Need for Facility" standard as "economically reasonable". As Option C, the Spencer to Alvey connection, can satisfy the project purpose of the Eugene to Medford 500 kV transmission line (DEIS S-5, 1-21; Routing Study 4-1), at a cost of nearly nine million dollars less than any connection to the Lane Substation, only Option C can be considered a "prudent" method of meeting the need for this Eugene to Medford transmission line project. This conclusion was reached by the presiding officers to the recent EFSC hearings on the proposed Eugene to Medford transmission line who stated as one of their proposed conclusions of law:

> "EFSC finds that for the BPA related and supporting facility option C will cost substantially less than options A (with its BPA portion of the preferred alternative) and B . . . and is therefore the only prudent option in the Eugene area." (Presiding Officers' Report, Proposed Order and Proposed Site Certificate, at page 19, July 16, 1982.)

D. There Is No Discussion in the DEIS of Power Savings in the Eugene Area as a Result of Recently Implemented Conservation Programs. 122-4

In assuming that a "reliability need" for a 500 kV loop around the Eugene area will accrue in the mid-1990's, the DEIS also fails to consider significant power savings in the Eugene area as a result of recently implemented conservation programs.

A description of the substantial savings in area power usage can be found in the attached Eugene Register-Guard article of June 21, 1982, entitled "Area Power Savings Surge". The failure of the DEIS to even consider the impact of home weatherization and other area energy saving programs is especially surprising as these programs are supported chiefly by the Bonneville Power Admistration as a part of its five-year, 1.25 billion dollar energy conservation plan aimed at reducing electrical needs. This failure of the DEIS to consider the significant effects of BPA and other conservation programs is another fundamental inadequacy in the DEIS' assumption of a mid-1990's "reliability need" in the Eugene area.

SECTION IV -- LAND USE

THE DEIS SERIOUSLY UNDERSTATES THE LAND USE IMPACT OF THE PROPOSED BPA PREFERRED ALTERNATIVE.

Though recognizing that there would be significant adverse effects to the "visual amenity" now associated with a large number of residences near the proposed BPA Preferred Alternative in the South Eugene area (DEIS p. S-8), the DEIS seriously understates the land use impacts of the proposed BPA Preferred Alternative in comparison to Option C.

A. The DEIS Understates the Number of Existent Residences Along the Proposed BPA Preferred Alternative. 122-5

The DEIS concludes that there are between 24 and 28 dwelling units within 1,000 feet of the Preferred Alternative right of way between Twin Oaks and Lane Substation. (DEIS p. 1-46, Table 1-5.) This conclusion is wrong and was admitted to be wrong by the Envirosphere Contractors, draftors of the DEIS, at the Oregon Energy Facility Siting Council hearing on this proposed transmission line in Medford, Oregon, beginning on June 29, 1982. It was the Envirosphere Contractors' testimony at that hearing that between 34 and 40 dwelling units lie within 1,000 feet of the Preferred Alternative between Twin Oaks and the Lane Substation. This original underestimation and the continued uncertainty regarding the number of residences that would be impacted by construction of the proposed BPA Preferred Alternative must be corrected and clarified in the final EIS. At a minimum, based upon the DEIS figures as thus far orally corrected, the proposed

BPA Preferred Alternative will run within 1,000 feet of between 114 and 130 houses and between 230 and 290 apartments. This is in contrast to Option C which would have absolutely no houses or apartments within 1,000 feet of its routing. (DEIS p. B-3; p. 1-46, table 1-5.)

B. The DEIS Fails to Analyze Land Use Impacts Upon Future Residential Growth in the Eugene Area. 122-6

Perhaps an even greater overrsight than the underestimation and confusion over the exact number of residences that would be impacted by the proposed BPA Preferred Alternative, is the failure of the DEIS to analyze land use impacts upon future residential growth in the Eugene area. As neither the DEIS nor any of its supporting documents make reference to detailed information prepared as part of the Eugene-Springfield Metro-Area General Plan, the extent of future development likely to be affected by the proposed BPA Preferred Alternative is seriously understated. When the Metro Plan was prepared, the entire Eugene metropolitan area was divided into analysis zones with detailed calculations of the amount of acreage available in each zone for development and assignment of anticipated number of dwelling units. As noted in James A. Saul's attached EFSC testimony, the Preferred Alternative traverses two such analysis zones:

1. Analysis zone E06 contains 350 acres of land allocated for residential development. The total number of new dwelling units allocated in this analysis zone under the Eugene-Springfield Metropolitan Area General Plan is 1,498. Because of the extent of existing development in the northern portion of that analysis zone, practically all of those additional units would be located

in the southern portion of the analysis zone adjacent to or near the Preferred Alternative route;

2. Analysis zone 019 contains 519 acres of vacant land allocated for residential development. The number of dwelling units allocated in the Metropolitan Area Plan to this analysis zone is 1,822.

The total number of new dwelling units anticipated in these two analysis zones (namely, 3,320) is significantly greater than that suggested in any of the reports prepared concerning the proposed BPA Preferred Alternative. The actual impact of the Preferred Alternative is thus far greater than that suggested in the DEIS or in any of its supporting documents.

There is also the significant possibility that construction of the proposed BPA Preferred Alternative to the Lane Substation will act as a deterrent to the establishment of future residential housing in the identified analysis zones. Construction of housing elsewhere would require change in the Eugene Urban Growth Boundary to incorporate a larger land supply and potentially require the provision of urban services to areas not presently served at a significantly increased cost to Eugene citizens. Neither the DEIS nor any of its supporting documents consider this possible relocation of Eugene's planned future residential growth.

C. The DEIS Fails to Adequately Assess Important Visual Impacts of the Proposed BPA Preferred Alternative.] 122-7

The DEIS fails to adequately assess important visual impacts of the proposed BPA Preferred Alternative including the visual effect of the proposed 160 foot transmission towers upon thousands of daily viewers in the greater Eugene area and the visibility of

the proposed BPA Preferred Alternative upon users of Spencer Butte Park.

1. The DEIS fails to discuss or evaluate the visual effect of the proposed BPA Preferred Alternative upon viewers in the greater Eugene area.]

Although the proposed BPA Preferred Alternative's 160 foot transmission towers would unquestionably be highly visible from many points in the greater Eugene area, the DEIS fails to discuss or evaluate the visual effect of this proposed transmission line upon viewers throughout the greater Eugene area. The failure of the DEIS or its supporting documents to analyze visual impact upon viewers in the central Eugene area, in particular, was admitted to by the Envirosphere Contractors at the Medford EFSC hearing beginning on June 29, 1982. Thus, the DEIS fails to assess the visual impact of the proposed BPA Preferred Alternative from residences and commercial establishments in the central Eugene area as well as from Skinner Butte Park and the newly constructed Hilton Hotel and its approximately 100 southerly facing "view" rooms.

The visual significance of the South Hills, through which the proposed 160 foot transmission towers of the BPA Preferred Alternative would run, for the entire Eugene community is perhaps best summarized in the following quotation from the Purpose Statements and Recommendations to the South Hills Study:

> "The South Hills constitute a unique and irreplaceable community asset. The strong, dominant land forms and wooded character present there combine to provide distinct areas of contrast in terms of texture and color from the

normal pattern of urban development. By virtue of this contrast, the South Hills function is a strong visual boundary or edge for the city."

The South Hills Study is a sub-plan to the Eugene 1990 Plan, acknowledged by LCDC on February 11, 1977, as consistent with LCDC Goals, and has been incorporated into the current Eugene-Springfield Metropolitan Area General Plan, adopted in August, 1980, amended in February, 1982, and scheduled for acknowledgement by LCDC in August, 1982.

Recognizing the extreme importance of the South Hills area, two programs were adopted by the City of Eugene as a result of the South Hills Study:

a. The City initiated a major acquisition program, involving over 3.5 million dollars of particularly critical properties in the South Hills area (a summary of the South Hills Ridge Line Acquisition Program is attached to the Comments); and

b. Since adoption of the South Hills Study in 1974, the City has required special review procedures for all developments in the South Hills area which might have an effect upon the visual significance of the ridge line. One of the specific objectives identified in the South Hills Study for those review procedures is to locate development in areas with the least potential for disruption of views of the ridge line. The proposed BPA Preferred Alternative transmission line would constitute the largest and most visually significant man-made structure or facility in the entire South Hills area.

Despite this tremendous commitment, through financial investment and land use planning, on the part of the people of the City of Eugene to protect the visual amenity of the South Hills ridge line, neither the DEIS nor any of its supporting documents consider the significance of the South Hills ridge line to the larger Eugene community. It is documented in the South Hills Study that the South Hills ridge line is visible to over 50

percent of the people residing in Eugene. (South Hills Study, p. 96.) Since the 160 foot transmission towers proposed by BPA would rise above any surrounding trees (DEIS, p. 3-39), the proposed BPA Preferred Alternative will be directly exposed to major portions of the entire Eugene population. This visual impact is simply not addressed in the DEIS.

Additionally, the DEIS (for example, at p. 3-34) measures the visual impact of the proposed BPA Preferred Alternative on the Ridge Line Park System only in terms of the proposed transmission line's effect on recreational use. The DEIS fails to take into account the fact that the Ridge Line Park has been acquired by the people of the City of Eugene not only for recreational use, but also for visual protection of the ridge line. The significance of the Ridge Line Park "[t]o ensure preservation of those areas most visibly a part of the entire community . . . and [t]o contribute to Eugene's evergreen forest edge", (South Hills Study, Purpose, Statements, and Recommendations, Ridge Line Park) simply is not considered in the DEIS.

2. The DEIS fails to adequately assess the visual effect of the proposed BPA Preferred Alternative upon views from the top of Spencer Butte. 122-9

Despite recognizing that "Spencer Butte is the highest point on [the Ridge Line Park] trail system and is one of the most prominant topographic features in Eugene as well as a very popular recreation site" (Routing Study, page 3-21), neither the DEIS nor its supporting documents suggest that any sort of adequate assessment has been done of the visibility of the proposed BPA

Preferred Alternative transmission line from points on the top of Spencer Butte.

The only reference in the DEIS or its supporting documents to the visibility of the proposed BPA Preferred Alternative from points on top of Spencer Butte is on page 6-24 of the Technical Investigations Document. This single reference simply states as a conclusion that "[f]rom the trails of Spencer Butte and from its top, the line is either invisible or only visible as a minor element in panoramic views." Missing from this DEIS "assessment" of the visual impact of the proposed BPA Preferred Alternative transmission line upon users of Spencer Butte Park are:

a. Factual information upon which the Technical Investigations Document's conclusion is based; and

b. Photographic views or similations of the visual impact of the proposed BPA transmission line from points on the top of Spencer Butte Park.

In contrast to both the apparent DEIS conclusion that the proposed BPA Preferred Alternative transmission line will not significantly impact the view of users of Spencer Butte Park is the attached testimony provided by James A. Saul at the Oregon Energy Facility Siting Council hearing considering this transmission line in Medford, Oregon, beginning on June 29, 1982. At that EFSC hearing, Mr. Saul testified as to the highly significant visual impact of the proposed BPA Preferred Alternative transmission line from the top of Spencer Butte Park and presented a series of six photographic exhibits documenting his conclusion. These photographs, identified as Exhibits "N" through "S" to

the EFSC testimony of James A. Saul, are also attached to these Comments. Examination of each of these photographs, taken from various positions around the top of Spencer Butte Park, demonstrates the highly significant visual impact that the proposed BPA Preferred Alternative transmission line would have on users of Spencer Butte Park. Rather than being "invisible or only visible as a minor element in panoramic views", these photographs evidence that existent 230 kV transmission towers currently spanning the proposed BPA Preferred Alternative route already significantly visually impact views from the top of Spencer Butte Park. Adding to this right of way transmission towers more than double the size of the 230 kV towers would dramatically increase this already significant visual impact. Examination of figure C-2 to the DEIS, a simulated view of the Preferred Alternative route in the Twin Oaks-Spencer Corridor from the ridge line trail, confirms the highly significant visual impact that the addition of 160 foot transmission towers would have from points on top of Spencer Butte Park. Spencer Butte is pictured in the upper left hand corner of figure C-2. To pretend that the addition of 160 foot transmission towers, as shown in figure C-2, would be only "a minor element in panoramic views" from points on top of Spencer Butte Park is to ignore reality. This conclusory statement in the Technical Investigations Document is wrong.

D. The DEIS Analysis of Land Use Ignores Most of the Relevant Planning Documents and Is Seriously Inadequate. 122-10

The DEIS consideration of land use is seriously inadequate. Its approach is to describe, in an extremely general way, existing land uses along segments of the line and to comment on impacts on different catagories of use, such as agriculture, residences, and commerce.

This approach ignores the comprehensive land use plans developed by local jurisdictions along the proposed route. Since the mid-1970's, cities and counties have been required, by state law, to adopt comprehensive plans. Most local governments have adopted comprehensive plans. These plans govern development activities such as construction, subdivision and the location of public facilities. Hundreds of thousands, if not millions, of dollars have been spent by local governments in the State of Oregon to adopt comprehensive plans. Although the Technical Investigations states that "federal regulations also require that Environmental Impact Statements examine project consistency with state and local plans" (p. 6-11), the DEIS does not examin local plans and treats state planning requirements only briefly.

The treatment of local comprehensive plans is contained in one paragraph. It reads:

> "The proposed transmission line would cross Lane, Douglas, and Jackson Counties and the City of Eugene. All of these governments have adopted comprehensive plans (Eugene and Lane County prepared a joint plan for the metropolitan area) and have submitted these plans to LCDC for review and formal acknowledgement. Upon review, LCDC has concluded that portions of the Eugene/Lane and

> Jackson County plans do not meet the statewide goals and guidelines. The Douglas County plan is still under review. For this reason, as well as for brevity, the general consistency of the proposed transmission line with the relevant statewide goals and guidelines is discussed here. Nevertheless, the provisions of the county plans that relate to transmission lines are broadly similar to those of the statewide goals and guidelines." (DEIS, at p. 1-54.)

This paragraph is breathtaking in its succinctness, but is grossly inadequate.

Land use planning, in Oregon, is primarily a local function. The statewide goals and guidelines are merely minimum standards which all plans should meet. Local plans are still binding and effective, even though they have not been acknowledged for compliance for the statewide goals, except where the state goals are more stringent. Consequently, local plans contain much more specificity and many different requirements than the extremely general statewide goals.

Even the plan's treatment of the statewide planning goals is inadequate. It consists, basically, of Table 1-7. That table gives a one or two sentence explanation of how each goal is met (this for a facility which crosses a variety of different terrains and development types).

Focusing now on the portion of the BPA Preferred Alternative that passes through the City of Eugene, two basic land use plans apply, namely, the Eugene-Springfield Metropolitan Area General Plan and the South Hills Study (a component of the Metro General Plan). A detailed analysis of the DEIS's deficiencies regarding

the Metro Plan and South Hills Study is attached in the form of a copy of the testimony of James A. Saul, presented to the Energy Facility Siting Council at the hearing on the proposed transmission line in Medford, beginning on June 29, 1982. A few of the major conclusions of Mr. Saul's analysis are as follows:

1. The extent of future development likely to be affected by the proposed transmission line is seriously understated. The number of new dwelling units anticipated to be constructed within the City of Eugene in the vicinity of the line is significantly greater than is suggested in the DEIS or any of the supporting documents and totals three thousand three hundred twenty (3,320) units.

2. The DEIS fails to take into account that the Ridgeline Park was acquired not only for recreational use, but also for visual protection of the ridgeline.

3. The DEIS and supporting documents fails to address the significance of the South Hills ridgeline to the remainder of the Eugene community as a whole. The South Hills Study shows that the original ridgeline in this area is visible to over fifty percent (50%) of the people residing in Eugene and is visible from the downtown area. In other words, the proposed transmission line will be directly exposed to major portions of the entire Eugene population.

4. The DEIS does not acknowledge the existence of significant development restrictions which have been imposed upon the area through which the powerline is proposed. These restrictions include special planned unit development review procedures, tree cutting ordinances, and the like.

The DEIS ignores the substantial effort that has been made over many decades by the City of Eugene to preserve its southern ridgeline, including the adoption of special comprehensive plans, development ordinances, and park acquisitions.

Similarly, the DEIS does not discuss the land use plans of Lane County. The Lane-Twin Oaks portion of the BPA Preferred Alternative (west of Eugene) lies within the Spencer Creek Sub-

discussed. The BPA Option B also passes, in part, through the Lower Coast Fork Sub-Area. That plan is also not discussed.

In addressing a local comprehensive plan, it is not enough to include a copy of the plan diagram and the key. There is much more to a comprehensive plan than that. To understand the diagram, or in the event of conflict, the text of the plan controls. Furthermore, Lane County's sub-area plans have adopted a matrix system for evaluating plan conformity by land use category. The matrix and text need to be examined along with the plan diagram and key.

Furthermore, the DEIS fails to address the Lane County Goals & Policy (October, 1980) which apply county-wide. These include:

> Goal 3: "Consider and support the electrical and communication needs of County citizens, while minimizing the adverse impacts on the rural and urban environment."
>
> Policy 12: "Encourage the conversion of overhead electrical and communication systems to underground facilities."
>
> Policy 15: "Review the proposals for major transmission lines, electrical substations, and power plants to ensure that each proposal is consistent with other governmental policies, plans and actions."

Finally, both the City of Eugene and Lane County have adopted ordinances to implement their comprehensive plans. These ordinances govern such matters as zoning, conditional use permits, land division, performance standards, etc. The DEIS contains no consideration of these matters. It should. For example, the

following portions of the Eugene and Lane County ordinances are relevant to this proposal. Eugene Code Sections 6.300 to 6.330, 9.636 et seq, and 9.508 to 9.520. Lane Code 10.320. In addition, the requirements of specific zoning districts (not previously referred to) apply to different segments of the proposed facility.

The Technical Investigations states (at p. 6-12) that: "local plan provisions are not summarized here. Instead, a series of separate documents is bingg prepared, one for each county, that provide a detailed analysis of consistency with local plans and the Statewide Planning Goals and Guidelines." Unfortunately, the DEIS does not provide the detailed analysis of state and local land use laws that the Technical Investigations promised.

In summary, the DEIS deals with land use by ignoring the extensive body of local land use plans and law that applies to the lands over which the transmission line is proposed to be constructed. This deficiency should be corrected; and affected lcoal governments and citizens should be given an adequate opportunity to review and comment on any new land analyses.

SECTION V -- ECONOMIC IMPACT

THE ECONOMIC IMPACTS OF THE BPA SEGMENT OF THE TRANSMISSION LINE HAVE NOT BEEN ADEQUATELY ADDRESSED BY THE DEIS

A. The Cost of the BPA Preferred Alternative is Significantly Greater Than the Cost of Other Acceptable Options.

The DEIS admits that the project need could be satisfied by a connecting line from Alvey to Spencer Switching Station. (DEIS at p. 1-21.) That line is identified as Option C, and is estimated to cost $3,010,000. That amount is $8,890,000 less than the portion of the Preferred Alternative that would not be expended if Option C is selected.

The DEIS attempts to justify the selection of the Preferred Alternative despite its higher cost by referring to the need for expansion of the Alvey Substation in the event that Option C is utilized. However, the DEIS makes no reference to the specific cost of that expansion. Thus, it is difficult to make a meaningful evaluation of the economic cost of Option C as compared to the cost of the Preferred Alternative. Furthermore, if BPA completes the "loop" of lines around Eugene as it proposes, the Alvey Substation will likely be expanded later, if not sooner.

B. The DEIS Fails to Adequately Consider the Financial Impact on Real Property Values in the Eugene Area.] 122-11

There are two types of potential impacts on real property values as a result of the proposed transmission line. The first relates to property which is needed for the transmission line right of way. The second type of impact is on property not required for the right of way but which is in proximity to the

line. The DEIS recognizes the distinction between these two property value issues but concludes in general that the proposed transmission "may arguably have a minor effect on property values in and adjacent to the corridor." (DEIS at p. 3-69.)

With regard to the first property value issue, the DEIS simply states that "it must be assumed" that the landowner generally receives fair compensation for the loss or restriction of use of the property which is required for the right of way. No specific attention is devoted to the particular properties which would be impacted in the Eugene area.

Although the DEIS recognizes that property would be required for the right of way and the owners of that property would be legally entitled to compensation, the cost of that compensation is not considered in the cost calculations for the routing options. This omission is particularly important since the Preferred Alternative goes through some of the most valuable real property in the Eugene area, especially in the South Hills and Lorane Highway vicinities.

Another serious failing of the DEIS relates to the impact of the BPA Preferred Alternative on the real property close to but not within the right of way. The DEIS asserts that research on this subject is inconclusive, but tends to support the belief that off-corridor lands are not significantly diminished in value. (DEIS at p. 3-70.) A preliminary survey by Mountain West Research,

Inc., is cited in support of the conclusion. However, an examination of the Mountain West document reveals that the DEIS reliance on it is misplaced and misleading.

The Mountain West Research survey in fact concludes that the overwhelming majority of studies with regard to the impact of transmission lines on land values exhibited contradictory conclusions and methodological weaknesses, and those studies do not provide the type of evidence upon which forecasts regarding potential land value impacts can reliably be based. (Electric Transmission Line Effects on Land Values: A Critical Review of the Literature, prepared by Mountain West Research, Inc., at p. 32.)

The Mountain West survey specifically pointed out that many of the studies in this area failed to allow for factors other than transmission line proximity which could have affected property values. Such methodological weaknesses cast serious doubt on the validity of their conclusions that transmission line proximity has no effect on land values. The Mountain West survey also noted that the preponderance of case studies to date have been carried out in the eastern and the southwestern United States which leads to questions about the applicability of those findings when applied to a transmission line project in the northwest.

Furthermore, the Mountain West review of literature in the field cites one particular study as being "one of the most sound pieces of research done on this question to date". (Mountain West Research, Inc., Survey at p. A-7.) That study clearly concluded that proximity to a transmission line is associated with

decreased property value. The decline in property value is greater with respect to properties in closer proximity to the transmission line. There is a large and statistically significant effect of proximity to transmission lines on the selling price of homes. (Electrical Transmission Lines and the Selling Price of Residential Property, Peter F. Colwell and Kenneth W. Foley, The Appraisal Journal, 47:490-99 1979).

Thus, it is clear that a review of the very authority cited by the DEIS in support of its conclusion that property values are not significantly diminished in value as a result of proximity to transmission lines fails to support that conclusion. Moreover, the most authoritative study reviewed in the Mountain West Research survey strongly supports precisely the opposite conclusion: There is a significant reduction in property values relative to proximity to transmission lines.

The DEIS is also internally inconsistent with regard to the question of impact on property values. The DEIS cites the 1981 federal court decision concerning a 500 kV BPA power line in Wasco County, Oregon, in which the court found significant value damage to property which was not within the right of way required for the power line. (DEIS at p. 3-70.) But despite that federal court decision on this very issue, the DEIS fails to reach the compelling conclusion that the existence of a 500 kV power line will significantly diminish the value of property which is in proximity to but not within the right of way.

Finally, the DEIS fails to contain any specific information with regard to the property which would be affected in the Eugene area. The DEIS relies instead on flawed studies of properties in other parts of the country without making any attempt to ascertain the impact on even a single parcel of property along the Preferred Alternative routing through the Eugene area.

C. The DEIS Fails to Consider the Financial Costs with Regard to Telecommunications.] 122-12

The DEIS acknowledges that the proposed transmission line will likely create interference with reception of radio and television signals. It further recognizes the obligation of BPA to restore radio and television reception at residences and commercial establishments to the original preconstruction quality. (DEIS at p. 3-82.) However, the DEIS fails to give any consideration to the economic costs of complying with that obligation. There is no indication anywhere in the DEIS that those expenses have been included in the cost calculations with regard to the routing options.

This failing is particularly noteworthy in view of the fact that there are no homes within 1,000 feet of the proposed line pursuant to Option C, yet there are a substantial number of residences in proximity to the Preferred Alternative. Clearly, the cost of restoring telecommunications to preconstruction quality will be substantially greater under the Preferred Alternative than under Option C. This significant cost differential should be addressed and included in the cost comparison of the routing options.

The DEIS also does not address whether additional costs will be required due to interference with commercial radio and television

transmissions from the telecommunications towers located on Blanton Heights, near the Preferred Alternative route.

D. DEIS Does Not Adequately Consider the Expense of Mitigation Measures in Comparing Costs of the Routing Options. 122-13

The DEIS discusses certain mitigation measures which could be utilized to reduce the environmental impact of the proposed line. Those measures include use of non-reflective conductors; use of non-reflective treatments to dull the galvanized tower steel; and use of tubular steel structures instead of steel lattice structures. (DEIS at pp. 1-51 and 1-52.)

Although the DEIS contains estimates of the cost per mile for some of the mitigation measuress, it does not include those figures in the cost projections for the various routing options. The identified mitigation measures are very expensive with cost estimates ranging from $200,000 to $500,000 per mile, depending upon the particular measure.

The failure of the DEIS to include the costs of mitigation in comparing the costs of routing options is particularly significant in view of the greater length of the line under the Preferred Alternative as compared to Option C, and in view of the fact that mitigation measures are likely to be required to reduce the visual impact of the towers in the more populated areas along the Preferred Alternative route. Mitigation actions which would serve to minimize or prevent impacts are defined in the DEIS but are not correlated with the environmental suitability comparisons nor are the costs of mitigation measures included in the projected cost figures for the routing options.

SECTION VI -- HUMAN HEALTH EFFECTS

THE DEIS FAILS TO ADDRESS STANDARDS FOR EXPOSURE TO ELECTROMAGNETIC FIELDS AND DOES NOT TREAT PSYCHOLOGICAL EFFECTS AS LEGITIMATE CONCERNS

The DEIS refers to existing research and ongoing research, but it does not specify the nature of such research, what it is, where it is being performed, and in what kinds of institutions.

The DEIS does not respond adequately to what it calls "public concern" about possible adverse health effects of 500 kV transmission lines. Also, it fails to refer to reports of the Department of Energy, the Interagency Task Force on Biological Affects of Nonionizing Electromagnetic Radiation, and Senate testimony in which further research is requested on long-term biological effects to exposure. The DEIS does not address the possible long-term, latent or subtle effects, be they carcinogenic, genetic, or mutagenic. 122-14

In the section on wildlife (at p. 3-24), the DEIS admits that "so little is known" about the effects of corona or of electric and magnetic fields on wildlife. Given the lack of research on the long-term health effects on humans of 500 kV lines and the lack of knowledge of effects on wildlife, it is improper to conclude as the DEIS does (at p. 3-81) that "the proposed line would present no significant health hazard to people or animals."

The DEIS addresses psychological concerns in its chapter on environmental consequences. At page 3-38, it states: "These 122-15

reactions are unavoidable if a transmission line is built." Psychological response of annoyance, frustration, and anger are legitimate reactions to the irritation of a nuisance. The final DEIS should address these responses fairly. The reactions of residents to corona effects, to short-term and long-term health effects, to hazards, to television and radio interference, and to potential devaluation of property values are serious social effects that should be given careful evaluation. 122-15

The threat of intrusion, change, or loss of aesthetic values can also lead to legitimate frustrations for persons who have built in or moved to the area along the suggested alternatives. The DEIS is wrong when it states that these reactions are unavoidable if a transmission line is built. These reactions are based upon perceptions, and these reactions will not occur if the transmission line is located away from people. Adverse psychological responses can be substantially avoided if the transmission line is routed away from populous areas.

SECTION VII -- SOCIAL, HISTORICAL & CULTURAL VALUES

A. CULTURAL AND HISTORICAL RESOURCES.

The DEIS Consideration of Cultural and Historical Resources Is Inadequate. 122-16

The Technical Investigations Document states (at p. A-26) that a study of cultural and archeological resources will be done to the same level of specificity as provided in the Midpoint to Medford 500 kV transmission line EIS. However, the Medford to Midpoint EIS is much more detailed than the DEIS for the current project. The final EIS should provide adequate information, as promised in the Technical Investigations Document, especially for the Eugene area.

The DEIS states that further surveys will be done once a route is selected (e.g., pp. 2-9). However, the DEIS does not state what steps will be taken if a new cultural resource were identified in the survey. The final EIS should explain in specific terms what steps will be taken to identify and preserve previously unrecorded cultural resources.

The DEIS fails to consider Spencer Butte as a historic landmark. For Eugeneans, the Butte represents the south locus of the "Butte to Butte" orientation along which Eugene's major street, Willamette Street, was constructed. The early purchase of the top of Spencer Butte, due to the threat of logging, confirms that:

> "By the late 1930's, the people of Eugene had recognized the hills which surrounded their City to be their collective heritage and had taken major steps to preserve them." (Henry W. Lawrence, "A Natural Landscape History of Eugene", Lane County Historian, Volume XXVI, Number 1 [1981])

Furthermore, the DEIS fails to recognize the historic significance of the area south and west of Spencer Butte. The area of Lane County through which Option B and portions of Option A are routed is a historic region and the final EIS should consider the research on this area. It is a region of early settlement with its own pioneer tradition and may well contain historic sites that have not yet been identified.

The DEIS states that inventories, including one in the Lane County Planning Office, were reviewed. However, the Director of the Lane County Museum has questioned the quality of the Lane County Inventory identified in the Working Paper on Historical Resources. (August, 1981). (The Director did not participate in preparing the Inventory nor did he review it prior to publication.) Further, the DEIS fails to refer to any of the historical studies that are now being done on this area (for example, the work of Lois Barton).

B. SOCIAL IMPACTS

1. Noise: The DEIS Fails to Address the Local Climatological Conditions in Eugene and Its Effect on the Corona of the Transmission Line. 122-17

The DEIS states:

> "The proposed transmission line would produce some operational noise effects associated with transmission line corona. Corona produces crackling and humming noises, particularly during foggy, very wet, or otherwise adverse weather conditions." p. 3-79.

Residents living near the transmission line would find the corona effects unpleasant and irritating, especially considering the number of days in which there is cloud cover and the number of days in which there is rain. The DEIS does not adequately address

the effect of the local climate on noise. For the 15-year period from 1966 through 1980, Eugene experienced from 112 to 153 days each year of more than 1/10th of an inch of precipitation per day. This averages 37 percent of the year. For that same time period, it was cloudy 59 percent of the time. Annual rainfall for the City during the period from 1941 through 1980 is 44.75 inches. Because of the frequent cloudy and wet weather in the Eugene area, the problem of noise generated by a new 500 kV line could be regular and frequent.

2. Reception Interference. The DIES Fails to State Whether Radio and Television Reception, Which It Admits Can "Occasionally" Be Affected by 500 kV Powerlines, Will Be Worsened by Local Climatological Conditions. 122-18

The DEIS states that a 500 kV transmission line can interfere with television and AM or CB radio signals, but qualifies that admission by stating that:

> "Such interference is generally limited to wet weather conditions and relatively remote locations where broadcast signals are weak." pp. 3-80.

This statement is unclear. The final EIS must address at least two issues on this point in further depth.

First, the final EIS should clarify the relationship between distance from the corridor, local weather conditions, and the resulting effects on residential reception. This should be done for each television and radio station available to residences.

Second, given the fact that major rainfall occurs between late September and the spring months, the EIS should relate such interference to the fact that more people spend more time indoors watching television or listening to the radio during times of wet weather.

SECTION IX -- CONCLUSION

The DEIS Contains numerous and substantial inadequacies. These inadequacies must be remedied prior to the publication of a final EIS. We strongly urge that you select Option C to connect the PP&L line with the existing BPA power grid.

Sincerely,

HUTCHINSON, HARRELL, COX,
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Response to comments in Letter 122:

122-1 See responses to Common Issues No. 2 and 4.

122-2 See response to Common Issue No. 4.

122-3 See response to Common Issue No. 2.

122-4 Power savings resulting from conservation are included in the load forecasts used for system planning, which are based on forecast input from the Eugene Water and Electric Board and the other Eugene-area utilities. The Eugene Register-Guard article describes conservation programs implemented by these same utilities. It is therefore not necessary to provide a separate EIS discussion of area power savings.

122-5 See response to Common Issue No. 1.

122-6 See response to Common Issue No. 6. As for the possibility that the new line would preclude further housing development adjacent to it, the number of new houses and multi-family developments along the existing transmission corridors in the Eugene area and along 500 kV lines elsewhere in the BPA service region appears to be strong evidence that transmission lines do not deter residential construction on adjacent properites.

122-7 (Note: This comment consists of two parts each of which has been given a separate number, 122-8 and 122-9).

122-8 The issues raised in this comment are discussed under comments 12-2 and 12-3. These responses are based on a previous study by Jones and Jones for BPA, Measuring the Visibility of High Voltage Transmission Facilities in the Pacific Northwest, 1976.

122-9 This comment asserts that "the DEIS fails to adequately assess the visual effect of the (project) upon views from the top of Spencer Butte". It draws conclusions on the visual impact of the draft preferred alternative based on 6 photographs submitted in testimony by James A. Saul. These appear to be taken from a point at or near the top of Spencer Butte.

The comment quotes the conclusions reached in the Technical Investigations Report, that "from the trails of Spencer Butte and from its top, the line is either invisible or only visible as a minor element in panoramic views." The comments also asserts that no factual information for this conclusion is presented, and that the DEIS contains no photographic views or simulations of impacts from the top of the Butte.

Careful review of the Saul photographs indicates that they do not support the assertions included in this comment; instead they confirm the analysis and conclusions in the Technical Investigations and DEIS. Saul's photograh labeled Attachment S is a view looking northwest towards Fern Ridge Reservoir and the Coast Range and shows in the foreground an area to the south of the Eugene city boundary and the ridgeline that is crossed by a portion of the draft preferred alternative route. The photograph clearly indicates the panoramic nature of views from the top of the Butte and the conclusion quoted above. The existing rights-of-way and transmission lines are minor elements in this view, because the rolling topography breaks up the clearing of the right-of-way into small irregular shapes while most of the towers are fairly distant from the top of the Butte and merge with the forest and open land through which they pass. At no point in this or other views from the top of the Butte are towers silhouetted against the sky.

The remaining five photographs all appear to have been taken with a telophoto lens and thus do not accurately represent the panoramic character of the views actually seen from the top of the Butte. The use of views taken with a telephoto lens to represent the actual visual experience from a viewpoint is not an accurate or acceptable technique. These five photographs cannot, therefore, be said to "demonstrate the highly significant visual impact that the proposed BPA Preferred Alternative transmission line would have on users of Spencer Butte Park." The only view taken with a lens that accurately represents the character of the views from the Butte suggests the contrary. This is demonstrated by Attachment R, which is a telephoto view that covers an area of approximately 20% of the view shown in Attachment S. This photograph, therefore, magnifies the visual impact of the towers and right-of-way as seen from the top of the Butte. However, even in this photograph the towers and ROW are not major elements in the view because of their distance from the Butte and the small area they cover in the photograph.

Attachment P and Q illustrate areas within the City of Eugene. Of all the six photographs, only P, which looks to the northeast (near Amazon Parkway), shows any houses in the vicinity of the line. This photograph also shows the dense stand of deciduous and evergreen trees between these houses and the ROW.

Attachments N and O appear to be telephoto views and look to the northwest at an area outside the City boundary. They do not show the portion of the draft preferred alternative that would enter the City of Eugene and demonstrate neither significant impacts on views from Spencer Butte nor on views from adjacent housing.

Attachment S illustrates the location of part of the right-of-way of Option B into Twin Oaks, from the south and, if anything, supports the conclusion that this option would probably have a greater impact on views from the top of Spencer Butte than the draft preferred alternative.

The reference to Figure C-2 of the DEIS appears mistaken. This view is taken from Dillard Road near the crest of the South Hills ridge. It cannot be reasonably concluded from this photograph and simulation that it "confirms the highly significant visual impact that the addition of 160-foot transmission towers would have from points on top of Spencer Butte park". This simulation shows the impact from Dillard Road and inferences about the corresponding visual impacts from any other points within this photograph must be drawn with great caution. Attachment Q is a telephoto view of part of this same section of the draft prefered alternative from the top of the Butte. It illustrates just how different the view from the top of the Butte is and how much less the visual impact would be from that point, compared to the Dillard Road viewpoint illustrated in Figure C-2.

122-10 The comment charging inadequacy of the planing review of the City of Eugene section of the draft preferred alternative refers again to Saul's analysis. It could, once more, be emphasized that projetions of future housing were not included in the DEIS because the comparative impacts on housing are adequately weighed by considering existing housing. There is no definition of "vicinity of the line" re: page 27, where 3,320 units are projected to be in that vicinity at an undetermined time in the future (see also comment and response 122-6). Regarding visual impacts, refer again to the DEIS text, stating that there are visual impacts, and responses to comments 12-2 and 12-3. Also note that no right-of-way increase is being proposed in the Eugene area, which minimizes tree cutting required. As stated in the Technical Investigations Report, working papers on the consistency of the project with local plans were prepared and submitted to the counties involved; Pacific used these working papers to develop independent plan consistency reports. The contents of these papers are now moot, as some local jurisdictions acted independently to determine consistency, as reflected in the FEIS.

122-11 See response to Common Issue No. 3.

122-12 The incidence of radio and television interference requiring mitigation, and the extent and cost of that mitigation, cannot be predicted in detail prior to the energization of the line. Standard utility policy and practice is to investigate complaints of interference, determine the legitimacy of those complaints, and take whatever action is necessary to restore reception where a transmission line has created interference. As noted in the response to Common Issue No. 5 and comment 122-18, interference and resulting mitigation in the Eugene area will be minimal because the area affected is close to transmitting sources and should experience good reception.

122-13 See response to Comment 116-1.

122-14 See response to Common Issue No. 5.
122-15

122-16 Cultural resources investigations conducted on the Eugene-Medford 500 kV Transmission Line Project are equivalent to those conducted on the Midpoint Malin line in that each satisfies the legal requirements of cultural resources investigations.

Studies conducted on the Eugene-Medford project are presented in a report on Cultural and Paleontological Resources prepared by the Oregon State Museum of Anthropology and in other supplemental reports.

The procedure to be employed if other sites are encountered during construction is described on pages 3-32 of the DEIS. Regarding future studies in the Eugene area the FEIS acknowledges that future cultural resource studies will be conducted near both the Eugene and Medford terminations of the proposed project. In the Eugene area, BPA will oversee studies conducted along the selected route, while on the segment of the route near Medford BLM and Pacific will oversee studies of the selected route in that area. These activities as described in Chapter 3 of the FEIS will be conducted in accordance with appropriate laws and regulations.

122-17 See response to Common Issue No. 5. The relationship between wet weather and the frequency of corona noise is clear in the DEIS. Climatic conditions in the project area are described in the DEIS, and it is not necessary to include data in the EIS on frequency of precipitation at numerous points along the proposed route. Further, the expected noise levels cited in the text and the response to Common Issue No. 5 are generally based on adverse (rainy) conditions. The magnitude and significance of noise impacts are much more dependent upon initial noise levels and attenuation than on the frequency of rain in Eugene.

122-18 See response to Common Issue No. 5. As indicated in this response, interference occurs only in proximity to transmission lines. The DEIS statement that interference is generally limited to wet weather conditions and remote locations refers to precisely that combined situation; interference rarely occurs were broadcast signals are strong, or in remote locations during dry weather. The incidence of interference is also largely a moot issue, due to the mandatory restoration of reception. The commenters' requested cataloguing of interference by each television and radio station, and investigation of seasonal watching and listening patterns, would therefore only contribute to the length and bulk of the EIS.

CITY ATTORNEYS
CIVIL DEPARTMENT • 101 EAST BROADWAY, SUITE 400 • EUGENE, OREGON 97401 • 503 687-5686
JOHNSON, HARRANG & SWANSON

August 6, 1982

State Director, Oregon
U. S. Department of Interior
Bureau of Land Management
Oregon State Office
P. O. Box 2965
Portland, OR 97208

RE: Proposed Eugene-Medford 500 kV Transmission Line:Your No. 1792.64 PP&L (935)

Following are additional comments the City of Eugene wishes entered in the record regarding the draft Environmental Impact Statement prepared for the above-entitled project. We appreciate the courtesy of allowing this submission extended to us in a telephone conversation with your office on August 5, 1982.

SUMMARY

The City of Eugene considers the draft Environmental Impact Statement for the proposed Eugene-Medford 500 kV Transmission Line (DEIS) flawed as to scope in that it attempts to piggy-back a BPA project for looping two 500 kV lines in the Eugene Metropolitan Area on to a project for extending a 500 kV line to serve Southern Oregon. Secondly, the City wishes to place on record certain local planning decisions regarding land-use which will affect the proposed BPA project. Third, the City requests that certain errors or omissions in the DEIS be corrected before any final action is taken thereon.

In support of this position, the City is including as part of this submission:

1. The June 11, 1982 letter to The Bureau of Land Management from Mayor R. A. Gus Keller,

2. An undated Memorandum to the Bureau of Land Management, Planning and Environmental Coordination Staff from the City of Eugene (signed by Timothy J. Sercombe of this office),

3. Testimony of the City of Eugene as a Intervenor before the Energy Facility Siting Council of the State of Oregon,

4. Determination and Recommendation of Lane Council of Governments at its meeting of June 24, 1982 as reflected in the

Agenda and Minutes of that body.

I

SCOPE

On Page S-1 of the DEIS, the Summary Statement of purpose recognizes there are two project the DEIS purports to evaluate: The PP&L proposal to extend a 500 kV transmission line from Eugene to Medford, and a BPA proposal to "satisfy a future requirement to upgrade service in the Eugene area." Under the concept of a "connected action" BPA then seeks to establish a major 13.5 mile 500 kV line in an urban area to connect the Lane Substation with the Alvey Substation. While the proposed "loop" in miles of facilities is relatively short, its location in an urban setting, its impact on urban parks, land use, housing projections and the socio-economic interests of the community require it be treated as a separate project proposal to be considered independent of any "connected action" involving different issues and needs affecting Southern Oregon as contained in PP&L's proposed project. 123-1

II

PUBLIC DOCUMENTS

The comprehensive plan for the City of Eugene has been acknowledged by the State Land Conservation and Development Commission since 1977, and its current up-dated plan is to be reacknowledged in August 1982. Because of the acknowledged plan the City Council becomes the governmental agency charged with declaring state and local comprehensive land use policies for properties within the City of Eugene. By Resolution 3685 adopted June 16, 1982 the City Council declared the then BPA project incompatible with the land use policies of the City. We request this determination and its accompanying support determination by the Lane Council of Governments (the A-95 Review Agency) be included as definitive of land-use issues in any adopted Environmental Impact Statement. Failure to do so may be in contravention of Congressional directives found in 43 USC 1965, and 42 USC 4231(c).

III

ERRORS AND OMISSIONS

The DEIS claims the BPA proposed "loop" will be necessary in the mid-1990's, yet there is no supporting data for that need except BPA's statement. The proposed looping project must be re-evaluated on substantive data including the recent forecasts on the annual 123-2

average energy percentage growth rates in the Pacific Northwest published in April, 1982 by BPA and the Pacific Northwest Utilities Conference Committee's announcements of May 13, 1982. 123-2

Reference is made in the DEIS that the Alvey Substation or the Spencer Switching Station would have to be modified if Option C is pursued. No where in the DEIS cost estimates is a cost for that expansion discussed. Given the significance of Option C any environmental assessment should include that facility. 123-3

Housing estimates contained in the DEIS are understated. Testimony was offered for the Oregon Energy Facility Siting Council in June, 1982 by the drafters of DEIS that in actuality there are between 80 and 90 existing affected houses and at the same hearing there was uncontroverted testimony by the City that at least 1,500 to 2,000 future residential housing units would be affected by the Preferred Alternative and Option A. 123-4

While there is some recognition in the DEIS of the sensitivity of the Ridgeline Parks as they affect the residential areas and the entire community. The City Requests testimony in the accompanying documents be reviewed and re-emphasized as to the importance of the area affected by the preferred alternative and the adverse affect of the proposed project upont he community. 123-5

Finally, no where in the DEIS is there any discussion of endangered plant life. Some of the plant life has been identified in the City's intervention testimony before EFSC. 123-6

Again, we appreciate the opportunity, and upon the DEIS and request that favorable consideration be given to limiting the scope of the DEIS to the PP&L project, and that the matter of the BPA proposed looping of 500 kV lines in the Eugene area be deferred and considered independent and apart from any justifications for the Eugene-Medford PP&L project.

Very truly yours,

JOHNSON, HAPPANG & SWANSON
CITY ATTORNEYS

A. Keith Martin
Timothy J. Sercombe

AKM:pp
Enclosures

Response to Comments in Letter 123:

123-1 There are very strong practical and regulatory reasons for proposing a transmission line that would be a joint effort between Pacific and BPA. The one-utility concept that is a fundamental aspect of power planning in the Pacific Northwest dictates that any system addition be planned within the context of system-wide operation and optimization. The one-utility concept reduces total system costs by avoiding the construction of duplicate facilities. In this case, construction of a new line from Eugene to Medford should not be undertaken as an independent action by one utility (Pacific), but should be coordinated with the needs of the BPA transmission system.

Aside from system planning goals and concepts, it must be recognized that the power to be transmitted through the Eugene-Medford 500 kV line must be transferred to Pacific by BPA. Power transmission in and around Eugene is the responsibility of BPA, due to the geographical arrangement of service areas and rights-of-way, and the only sources of power to Pacific are BPA's Lane and Alvey Substations. Given these practical considerations, it is logical that BPA construct the northern terminal segment of the proposed line.

Further direction to include a BPA action with the Pacific proposal comes from the federal Council on Environmental Quality (CEQ) and the Oregon EFSC. The CEQ regulations on the implementation of the National Environmental Policy Act (NEPA) state that agencies shall use approaches such as that employed by BPA on this project to reduce paperwork and delay. Specifically, the CEQ regulations advocate the use of tiering on environmental impact statements for related actions, and the adoption of appropriate environmental documents prepared by another agency (40 CFR 1500.4-5); in this case, BPA will be

adopting the EIS prepared by the Bureau of Land Management to fulfill the CEQ goals. The Oregon EFSC also recognized the one-utility concept and Pacific's need for a connection at Lane or Alvey in issuing its standards and recommendations relative to the Pacific proposal. Specifically, EFSC required that both Alvey and Lane be investigated as alternative terminal points, as was done in the EIS (OAR 345-80-052).

The previous points demonstrate that it is appropriate to link the Pacific and BPA actions in a single EIS. The setting of the initial BPA proposal has no bearing on the appropriateness of joint versus separate EISs. More importantly, the environmental effects of the proposed Lane-Spencer link were described in depth in the DEIS, thereby meeting the CEQ requirements. It is also important to note that BPA was not proposing to construct the entire link between Lane and Alvey as part of the Eugene-Medford project. BPA was only proposing to build that portion of the route that was in common with Pacific's need for a power source near Eugene. Regardless of the route configuration selected in the current decision, the remainder of the Lane-Alvey connection will be constructed at a later date, at which time it will be subject to full NEPA compliance.

123-2 See response to Common Issue No. 2.

123-3 Subsequent to public comment, further studies by BPA systems engineers indicate that Option C can be implemented by terminating the 500 kV line at Alvey Substation without expansion of Spencer Switching Station. The space limitations at Alvey would require a gas-insulated circuit breaker (as opposed to a standard overhead power circuit breaker) at a cost of approximately $2.1 million, compared to a cost of about $3.5 million for development at Spencer. The cost figure for Option C stated in the DEIS (p. 1-21) reflects the cost of terminal equipment at Alvey. This connection at Alvey would have no perceptible bearing on the visual, noise, land use, or other environmental effects of Alvey Substation.

123-4 See response to Common Issue No. 1.

123-5 See responses to Comments 12-2, 12-3, 122-6 and 122-8. The adverse effects are described at numerous places in the DEIS.

123-6 Endangered plant species were adequately described in the DEIS, on pages 2-7 and 3-16 to 3-20, and were treated extensively in the Technical Investigations Report. The species included in these discussions are candidate and listed species as officially recognized by the U.S. Fish and Wildlife Service, the federal agency responsible for administering and implementing the Endangered Species Act. Cross-examination at the EFSC environmental hearings in June of 1982 established that the City's identification of endangered species was done erroneously and without accurate knowledge of the official listings.

14 MR. OSTRANDER: Next is City Counciler Cynthia
15 Wooten.
16 MS. WOOTEN: Thank you. My name is Cynthia Wooten
17 of the Eugene City Council. I appreciate the opportunity to
18 be here this evening with you and I'd like to speak with you
19 on two issues involving the preferred BPA route through the
20 South Hills of the city.
21 The preferred route is inconsistent with the City's
22 adopted comprehensive plan as refined to the South Hills
23 study an adequate need for this section of the project has
24 not been demonstrated. The draft environmental impact
25 statement is inadequate to addressing both of these issues.

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1 be needed for at least 25 years.
2 Much can happen in 25 years that could effect the
3 need for the project at all. Constructing the project
4 through the South Hills of the City at this time will
5 effectively commit this area as a major regional transmission 2-8
6 corridor. There is no place in the South Hills for this type
7 of use.
8 The project is inconsistent with our adopted
9 comprehensive plan and is not needed for at least 15 to 25
10 years. We ask that the preferred option not be chosen.
11 Thank you for seriously considering our comments.
12 MR. OSTRANDER: Thank you, and thanks for the use of
13 the room.

VERBAL COMMENTS

Hearings transcripts were prepared for all three public hearings, at which numerous public comments were offered. Substantive verbal comments were identified from the transcripts. However, not all of these comments have been reproduced for the FEIS because many of the speakers at the hearings also submitted written comments. Copies of verbal comments that did not duplicate written comments are included, and the following responses have been prepared.

Comment 2-8: The project would commit the South Hills area as a major regional transmission corridor, and there is no place for this type of use.

Response: Constructing a 500 kV line in the existing corridor through the South Hills would establish this as a major transmission corridor, although it would be more of local than regional significance. However, the level of development in the existing corridor indicates that it already is a major corridor.

6 MR. OSTRANDER: James Coons.

7 MR. COONS: Thank you, gentlemen. My name is James

8 Coons, I am the attorney with the Eugene law firm of

9 Hutchison, Harrell, Cox & Teising. With my colleagues, Bruce

10 Anderson and Doug DuPriest, we represent the interests of 32

11 individuals or families all of who either live or own

12 property within 1,000 feet of the preferred alternative to

13 the transmission line. We also are authorized to speak on

14 behalf of the South Hills Neighborhood Association and the

15 Lane County Audobon Society to express some of the concerns

16 of these individuals and these groups with regards to the

17 proposed Environmental Impact Statement.

18 As an initial matter, I would like to join in the

19 request made by Mr. Sercombe on behalf of the City of Eugene

20 for a 30-day extension of time for submission of written

21 comments. The applicable regulations provide for a minimum

22 of 60 days for public comment from the time the draft EIS is

23 available. That 60-day minimum is the only time period that

24 has been allowed until now. The Environmental Impact

25 Statement which contains the information necessary to form

1 some publicity was generated. The publicity has now been
2 generated. The community is concerned. We need the
3 opportunity. The community deserves a reasonable opportunity
4 to respond to submit meaningful written comments. An
5 additional reason why public participation in this decision
6 making process is so absolutely critical is that state
7 statutes and state regulations provide that once a
8 transmission line of this magnitude is constructed, any
9 additional construction of transmission lines within 500 feet
10 of that initial existing corridor are not subject to any
11 action by the State.
12 As you gentlemen well know, the Oregon Energy
13 Facility Siting Council currently has some authority with
14 regard to this current proposal. But once the proposed 500
15 kv line is in place, the federal agencies are not required to
16 adhere to any state standards for expansion for additional
17 lines for 500 feet within that initial corridor.
18 And I would further note that the Environmental
19 Impact Statement itself admits that a second 500 kv line is
20 contemplated and will be required at some future date. Yet
21 that second line will not be required to go through the same
22 public decision making process, same public participation
23 process that we are now involved in. It's critically
24 important a proper decision be made now with regard to
25 providing this line.

5-7

Comment 5-7: A second 500 kV line, when proposed, would not undergo the same decision and public participation process currently taking place.

Response: The Oregon standards for the siting of transmission lines do exempt proposed lines that would be entirely within 500 feet of an existing EHV (above 230 kV) corridor from the EFSC site certification process (OAR 345-80-025). The National Environmental Policy Act, with its requirements for public participation and documentation of environmental analysis, would still apply to a second 500 kV line from Eugene to Medford.

1 MR. LOWE: My name is Raymond Lowe, I live at 85362
2 Bailey Hill Road. I own short of five acres at this address,
3 which the present east-west line crosses, 145 acres off Pro
4 Road which is currently over 7 acres confiscated to allow the
5 same line.
6 My daughter and son-in-law are in the midst of
7 building a home well within the proposed area. I am
8 disturbed about a number of matters, some of which have
9 already been identified here, and that the editor wrote in
10 the in a carefully prepared statement prepared in the
11 Registered Guard. With one exception I can't repeat those.
12 The exception has to do with the remark appearing in
13 this evening's paper contributed to Congressman Wooten. She
14 reported to the effect that after a two hour session with BPA
15 officials there appeared to be little room for change. My
16 earlier experience with BPA would support the remarks of one
17 of the speakers we have already heard. And I raise questions
18 as to why I wasn't consulted about the present line. When I
19 raised questions as to what right BPA had to cut a four-foot
20 swath across ten acres of my property without my knowledge, I
21 was dismissed with the remark, "Your money for the easement
22 can be picked up at any time at your convenience."
23 I'm concerned that Pacific Power and Light and
24 Bonneville Power are by design a bureaucracy and as such
25 would be concerned less with people, their hopes, their

aspirations, their disappointments and more with procedures, technicalities and legal requirements and experts. This matter is far too serious to be left to experts.

The mockery requires the people to participate in the decision making process, not in the decision, in the discussion of the decisions that already have been made. But hope springs eternal. So I am appearing and pleading for your attention.

As I understand Plans A and B, the new line is to cross the properties I have cited. I am concerned for the most part with the line over which I live. About ten years ago with county approval, I completed a fair sized barn. I placed it carefully 110 feet in parallel 2, the present electric line. If I understand the proposed plan, and I say proposed advisedly, I am sure to the contrary is not withstanding. If the proposed plans in B will become final my barn will be dissected the entire length of 45 feet. About six years ago I installed at the cost of $6,000, with the urging of the county, a septic tank system, none of which extends into the present line area, all of of which would be included in the proposed widened route.

My home about to be completed, taxed at a value of over $100,000, was carefully located over 200 feet from the present line. This was to avoid the smack, crackle and pop sounds that are so well appreciated in cereal but totally

9-1

unacceptable on radio and television.

The new line would leave constant annoyance. I also placed the home 175 feet from the road, relocated a driveway, so that I could avoid the noise barrier to reduce the traffic noise well below the 50 D A B of traffic at 100 feet. These figures, I believe, appear in the E I S study before us this evening.

In short, I have spent over ten years attempting to comply with county and State codes to provide liveability, one which in most of our circumstances requires a lifetime to acquire.

Now, what is one to do? And I would add I am assuming I am but one who finds himself or herself in such a circumstance. What is one to do? Do we succumb, accept it,

9-2

Comment 9-1, 9-2 The proposed plans would severely affect the commenter's home and barn.

Response: The comment is noted. The revised configuration of the draft preferred alternative would avoid these impacts.

Ostrander Thomas Wallace.

Wallace My name is Tom Wallace. I have Mission Bell Ranch, 18435 East Evans Creek Road, Rogue River. We are established in a valley just above Ramsey Canyon. We are, as a group here tonight, we have a proposal which I would like to assist on because there is something that can be done in our case. It can help you folks and it can help us both. Now, we currently have the corridor running almost through the middle of our Mission Bell Ranch. We feel that if we could establish this corridor back in the Boise Cascade Forest and BLM lands by a mere move of, say, 250 or 300 feet at least minimum, we could get them off the ranch into property where there are no people by backing it up into the mountain one more step, one more stage. Currently I feel this way about the health situation. I don't know what your impact environment, in fact, reading is going to be on health of individuals, but I am in electronics and have been for many years. I worked in electrostatics and capacitors specifically. I have a strong feel that the electromagnetic fields and the electrostatic fields that

25-1

Comment 25-1: A minor readjustment of the proposed route would avoid impacts to 25 to 30 families.

Response: The route described in the DEIS is actually a corridor of about one-quarter mile in width. The suggested alteration would be within this band, and Pacific has been working on route alterations with residents of this area.

are built up around these properties where you are too close and you are adjacent in your bodies there is cell mutations and splitting. And you know that once the cell mutations and splitting take place the cancer takes place in individuals. Now there is an unusual amount of cancer in steers and animals in the packing plants that they cannot account for and many of these grazing animals are under power lines. I would like to state unequivocably that the human body is a super, super sensitive electro device and these high tension, high power lines do have an effect on the cell tissue. We know electronics and electrical things have terrible influences on people. White noise, unaccountable noise like rf frequencies do disturb people mentally. I would ask one thing, that you do consider moving this line back away off of our property and away from the 25 to 30 individual families in our valley. Take the line away from the -- going directly on top of one of our homes; directly over one of our houses. I think the cost will be highly advantageous. We will at least be at peace with ourselves, for here is a condition that can be eradicated. Thank you.

Ostrander Thank you. Lester G. Garman.

Garman In the interest of cutting down on the time I will skip the items that Mr. Dahwny has covered because I agree with everything that has been said on those that are against the east power line proposal. My name is Lester G. Garman and with my wife Mabel own and live on tax parcel 9400 35-1 east at 1477 Worthington Road, Eagle Point. In addition we lease and ranch the adjoining 40-acre tax parcel, 10500 35-1 east at 1771 Worthington Road, and these are both in Eagle Point. Our house is located approximately 2,000 feet from the center of the proposed east 500-kV power line. And the proposed line crosses the corner of the leased 40 acres

so we are in the close proximity of the proposed east line. I am a retired registered electrical engineer from California and was qualified as an electrical, civil and mechanical engineer for the United States Government Navy Department. I do not want to live under, ranch under or be near a 500KV line and we chose to retire in this area of Oregon for the very reason to get out of these cities such as Seattle/Los Angeles that have a network of power lines running over houses and everything else. Before expressing my opinions on the proposed east 500KV power line, I would like to make a few observations concerning the existing 500KV line from Wyoming to Medford. I feel that the Southern Oregon taxpayers, PP&L subscribers and the Jackson County commissioners were misinformed by lack of information on the total cost, including the long period of interest costs, Also the almost automatic approval of the 500KV line to Eugene as soon as existing line could be installed to provide a new system which, as an engineer, I admit is desirable. On the proposed east route versus the use and expansion of the existing powerline corridor through the Rogue River Valley I feel that after reading the new technical investigations which mostly corrected most of the errors in the routine study report and the Environmental Impact Statement, I do not believe that they treat the environmental destruction of the undisturbed lands along the east route totally or in detail enough to show the disturbances that will actually be caused by the construction of the roads or the line construction and the line construction itself. Much of the land is somewhat inaccessible and on formations that will make foundations difficult and very expensive. 27-1

TAPE PROBLEMS FOR THE REMAINDER OF SIDE ONE

Comment 27-1: The DEIS treatment of effects on the undisturbed lands along the east route in the Medford Basin is inadequate.

Response: The DEIS currently identifies the state of development of lands along this route, and fully and openly describes the effects the project would have in this area.

Thomas My name is Robbie Thomas.

Ostrander I'm sorry. I somehow associated you with Jack Thomas because this is the same address and the same name.

Thomas I am his wife and I have been very supportive of his efforts at home and, you know, with the neighbors and everything, but I feel that my opinion should be not by association but my own personal feelings so I have made up my own statement. I am just one of many concerned landowners that fear the effects of the preferred eastern route for Pacific Power & Light's Eugene-Medford 500kV transmission line. In these times of a depressed economy where many industries have been forced to close down, can we afford to jeopardize the revenue that Oregon's tourism brings from the thousands of campers, fishermen, sightseers and vacationers that swarm to the Rogue River and its recreational facilities yearly? The area where the preferred route crosses the Rogue River plays an important part in the tourist industry. The Rogue River also supplies food and refuge for various forms of wildlife and a flight pattern for many species of birds. The balance of nature for this area will be greatly affected by the intrusion of these power poles and the tremendous amount of energy generated along these lines. The depreciation of property will affect many more landowners than Pacific Power & Light will be required to compensate. What is just compensation for the disruption of sight, sound and peace of mind in peoples' lives? I find it extremely difficult to believe that the cost would be less to acquire new easements, establish new access roads, strip land for a new corridor, construct new towers and maintain two complete routes than it would cost to adapt and maintain the one

29-1

Comment 29-1: The project would jeopardize the tourism activities centered on the Rogue River.

Response: The effects of the proposed line on Rogue River recreation are adequately described in the DEIS.

existing corridor. I have reviewed the Environmental Impact Statement and the simulated views of the preferred route and the existing route depicting the visual impact to each route. My intelligence was offended by the flagrant maneuvering of the angles of the photographs and the obvious differences in distance. None of the simulations viewed down the corridor for the eastern route where the land must be stripped. However, all of the existing corridor views display tower after tower looming up either in an open field or along a country road. Absent from the selection of visual impact views were any photographs of the existing corridor that presently runs through the Medford sewage plant, the White City industrial area or where the line crosses the Rogue River in an area that is inaccessible to the public. In one of the photographs of the eastern preferred route the illustration leaves you hunting way off in the distance for the lightly penciled-in towers. I wonder how hard you would have to hunt for the towers if you were closer and viewing down the corridor. We purchased our home because of the beautiful setting and distance from town. The majority of the residents that will be affected in White City moved into that area after the existing corridor was already in existence. They chose their homesites just as we did. I apologize for the length of my letter and I invite you to view the proposed corridors personally and evaluate for yourselves which corridor would have the least visual impact. Thank you for your consideration.

29-3

Comment 29-3: The selection of photograph scenes and angles and the photo-simulations were subject to flagrant maneuvering.

Response: The selection of views included in Appendix C of the DEIS was based on discussion and review among the EIS preparers and cooperating parties, with an overall objective of providing an adequate sample of representative views without unnecessarily adding to the expense of the document. These photos were selected because they best represented ultimate views of the proposed line, in terms of most common viewer location and orientation. All photos were taken with a standard 50 mm lens, although the Takelma Park view consists of two photos spliced together.

The two views along the proposed eastern corridor, at Takelma Park and the Crater Lake Highway crossing, are the most common views that would occur. A long view down the corridor at Takelma Park would not be possible, because the line would be north of the park on private property and the river banks would block views from boats. The perpendicular crossing of the Crater Lake Highway would provide only an instantaneous view down the corridor to persons in automobiles, while forward views closer than shown in Figure C-18 would not include towers due to intervening vegetation. Contrary to the comment, a view of the White City area is included in the DEIS (Figures C-22, 23, and 24). This view and the Sams Valley scene present common views down the existing corridor from Highway 140 and Table Rock Road, respectively, due to parallel orientations in these areas. Views of the Medford sewage plant property and the existing Rogue River crossing were not included because very few people would experience such views.

CHAPTER 5

PREPARERS

PREPARERS

COOPERATING PARTIES PERSONNEL

As described in the Introduction, four agencies were involved in activities which led to the preparation of this EIS. These organizations (Bureau of Land Management, Pacific Power and Light Company, Bonneville Power Administration and Oregon Department of Energy, are defined as the Cooperating Parties with responsibilities described in the Memorandum of Understanding included in Appendix D. The individuals representing these agencies who provided information and otherwise participated in project activities are listed below:

Bureau of Land Management

Philip C. Hamilton
Roland D. Smith

Pacific Power and Light Company

Paul D. Higgins
Kenneth Stevens
Howard Ferris

Bonneville Power Administration

Robert W. Beraud
Michael L. Johns

Oregon Department of Energy

Peter J. Paquet

LIST OF PREPARERS

Envirosphere Company

William D. Kitto, Project Manager

Seven years of experience in conducting and supervising engineering, environmental and energy planning, and environmental impact assessment in both the public and private sectors.

Roger G. Anderson, Resource Planning

Ten years of experience in the design and implementation of resource planning and environmental assessment programs associated with water and land resource development projects.

Donald L. Beyer, Aquatic Ecology

Eleven years of experience in coordinating aquatic monitoring programs and studies, investigating the impact of drilling fluid discharges, and conducting bioassays.

John J. Brueggeman, Terrestrial Ecology

Seven years of expereince in wildlife biology, including study design, coordination, field study, analysis of terrestrial investigations, and impact assessment.

Alan B. Carpenter, Climate and Air Quality

Five years of experience in air quality/air pollution control, air quality site selection surveys, and meteorological monitoring programs.

Ellen S. Cunningham, Land Use and Socioeconomics

Five years of experience in regional land use, water resources, energy resources, and socioeconomic studies.

Karol A. Erickson, Geology, Soils and Water Resources

Three years of experience in geology, soils and hydrology including development suitability studies, reviews of environmental plans, and computer modeling of reservoir operations.

Randal L. Fairbanks, Terrestrial Ecology

Nine nears of experience in the design, coordination, and conduct of comprehensive environmental monitoring programs, ecological research, and ecological inventories.

William F. Hahn, Geology and Soils

Eight years of experience in performance and technical management of geologic and hydrologic investigations for site selection studies, permit applications, water resources evaluations, and environmental reports.

Joel I. Klein, Cultural Resources

Twelve years of experience in cultural resource identification and evaluation for environmental impact statements and assessments of power plants and transmission facilities.

Chris E. Lawson, Socioeconomics and Land Use

Four years of experience in regional planning, economic and geographic research, and socioeconomic reviews and impact assessments.

Edward C. Lesnick, Jr., Economics

Twelve years of experience in economic research, college-level teaching, and conducting economic consulting studies of energy and load forecasting, utility rates and regulatory affairs, power system planning, project evaluation, and socioeconomic impacts.

R. John Little, Terrestrial Ecology

Thirteen years of experience in management, teaching, and research, including the planning and implementation of environmental projects involving terrestrial ecology and floristics, vegetation analyses, and environmental inventories and assessments.

Bruce C. MacDonald, Meterology and Air Quality

Thirteen years of experience in weather forecasting activities, meteorological monitoring programs, dispersion modeling, and air quality impact assessment.

Michael Pavone, Geology and Soils

Eight years of experience in geotechnical and structural engineering for utility facilities, including work on drainage provisions, compaction requirements, erosion protection, stability analyses, field subsurface investigations, foundation design, and preparation of specifications for site development work.

Amadeo J. Rossi, Noise Effects and Control

One year of experience on noise effects and control measures. Experience includes: industrial applications, particularly in the area of fossil fuel and wood fired combustors; material handling equipment; noise from forest products facilities; and noise effects from transmission lines and associated facilities.

G. Frederick Shanholtzer, Terrestrial Ecology

Sixteen years of experience in supervising and conducting field wetlands and wildlife studies, terrestrail ecological studies, and power plant siting studies.

Frank B. Titus, Geology and Soils

Twenty-eight years of experience in supervising and conducting environmental studies, teaching hydrogeology, and performing geologic research.

Paul White, Hydrology and Geology

Nine years of experience in hydrology and geohydrology, involving sedimentation studies and sedimentation pond design, sampling and general site hydrology, baseline monitoring, and diversion planning.

Diana J. Zamber, Terrestrial Ecology

Five years of experience in fish culture, horticulture, technical research, information systems, public relations, endangered species surveys, general terrestrial ecology, and visual resources.

Jones and Jones

William G.E. Blair, Principal-in-Charge, Visual Resources and Land Use

Twelve years of technical and supervisory experience in architecture, landscape architecture, land use planning, and visual resource assessment.

James Klein, Cartographics and Land Use

Three years of experience, including cartographic work with the U.S. Forest Service and graphics, landscape architecture and land use work in private practice.

Iain M. Robertson, Visual Resources and Land Use

Nine years of experience in landscape architecture, regional and environmental planning, and visual resource assessment.

University of Oregon, Department of Anthropology

(Cultural Resources sub-consultant)

Don E. Dummond, Principal Investigator

Twenty-two years of experience in teaching, research, field investigations, and consulting in the fields of archaeology and anthropology, including four years as director of the Oregon State Museum of Anthropology.

Thomas J. Connolly, Field Supervisor

Five years of experience in conducting and directing cultural resources surveys, archaeological research, and archaeological field investigations.

Eric P. Gustafson, Paleontology

Four years of experience in teaching, research, consulting, and related activities, specializing in the field of vertebrate paleontology.

Garry O. Stephenson, Ethnography and Architectural History

Four years of experience, primarily as an architectural historian with additional work on studies involving archaeology, anthropology, and ethnography.

APPENDIX A

PACIFIC POWER & LIGHT COMPANY
920 S.W. SIXTH AVENUE • PORTLAND, OREGON 97204 • (503) 243-1122

October 23, 1981

Mr. Philip C. Hamilton
Chief, Division of Planning and
Environmental Coordination
Bureau of Land Management
Oregon State Office
Post Office Box 2965
Portland, Oregon 97208

Dear Mr. Hamilton,

To enable your agency to evaluate the environmental impact of construction, operation and maintenance of the Eugene-Medford 500 KV Transmission Line, attached please find a listing of our construction, operation and maintenance practices. It is our expectation that in providing this list, unnecessary lengthy discussions in the EIS of environmental effects in the absence of mitigation and the effects of mitigation can be avoided.

Pacific will implement these practices on public lands. Similar arrangements are negotiated with the private landowner during right-of-way acquisition.

The listed practices are intended to: reduce soil erosion (1, 2, 3, 4, 5, 8, 14, 16, 19, 20, 21, 24); protect water quality (1, 2, 3, 4, 5, 10, 14, 16, 19, 20, 25, 27); reduce impacts on vegetation (1, 2, 3, 4, 5, 10, 11, 19, 24); reduce impacts on fish and wildlife and their habitat (1, 2, 3, 4, 5, 10, 11, 12, 14, 15, 19, 20, 24, 25, 30); protect archeological and historic resources (2, 3, 13, 19); protect public health and safety (1, 2, 3, 6, 7, 9, 10, 12, 16, 18, 20, 21, 23, 27, 28, 29, 30, 31, 32); and to reduce conflicts with current and planned land uses (1, 2, 4, 6, 7, 8, 12, 16, 17, 19, 21, 22, 23, 24, 25, 26, 33).

If we may be of additional assistance in this matter, please advise.

Very truly yours,

Paul D. Higgins

Paul D. Higgins
Pacific Power & Light Company
Project Manager

PDH:sg

Attachments

cc: Messrs. Bill Kitto w/attachments
Bob Beraud
Peter Paquet

CONSTRUCTION, OPERATION, AND MAINTENANCE PRACTICES

1. Any property or resource harmed or damaged by Pacific in connection with the Line will be reconstructed, repaired, and rehabilitated by Pacific.

2. Pacific will locate, design, and construct the Line and related facilities, including access roads, consistent with the criteria jointly established by the Secretary of the Interior and the Secretary of Agriculture and set forth in the publication entitled, "Environmental Criteria for Electric Transmission Systems".

3. Pacific will require its contractors and their employees to be aware of and abide by Rules of Conduct as stated in 43 CFR 6010.2 (1977) when operating on Federal lands. This chapter will be available to all personnel and, consistent with the purposes of the permit, the rules will be strictly followed.

4. Pacific will conduct all construction and maintenance activities in a manner that will minimize disturbance to vegetation, drainage channels, and streambanks. Pacific will utilize soil and resource conservation and protection measures on the land covered by the right-of-way as the BLM determines are reasonably necessary.

5. Pacific will furnish to BLM for approval a clearing and rehabilitation plan which will include clearing methods, site preparation, plant species to be seeded, rate of seeding, and time of seeding of temporary roads, other disturbed areas and waste disposal areas prior to construction.

6. Within ninety (90) days after conclusion of construction operations, all construction wastes including trash, garbage, petroleum products, and related litter, and vegetative debris accumulated through land clearing, will be disposed at an authorized waste disposal area in accordance with an approved rehabilitation plan.

7. Upon completion of construction of the Line, Pacific and the BLM will review Pacific's plan for maintenance of the Line. Either party may request that the maintenance plan be updated to meet changing conditions. Amendments and revisions of the maintenance plan will be subject to the approval of the BLM.

8. Public land areas used for temporary access roads, equipment storage, and other construction activities will be restored by Pacific in accordance with an approved rehabilitation plan.

   Whenever revegetation is required under the rehabilitation plan, Pacific will file a report with the BLM when such planting is completed. The report will contain information regarding the location of

the area; the type of planting or seeding, including mixtures and amounts; the date of planting; and other relevant information as may be required by the BLM.

9. Pacific will construct the Line so that it will conform with all applicable Federal Regulations regarding aircraft safety.

10. Pacific will comply with the applicable federal and state laws and regulations concerning the use of pesticides (i.e., insecticides, herbicides, fungicides, rodenticides, and other similar substances) in all activities/operations under this grant. Pacific will provide BLM a written plan prior to the use of such substances. The plan will provide the type and quantity of material to be used; the pest, insect, fungus, etc., to be controlled; the method of application; and other information that the BLM may require. The plan will be submitted no later than December 1 of any calendar year that covers the proposed activities for the next fiscal year. The use of substances on or near the right-of-way will be in accordance with a BLM approved plan. A pesticide will be used only in accordance with its registered uses and within other limitations imposed by BLM.

11. Pacific will comply with applicable federal and state laws and regulations regarding protected plant and animal species and will conduct construction activities in a manner to avoid or minimize their disturbance.

12. Pacific will cover or temporarily fence the holes excavated for tower footings at the end of each working day for public safety and the protection of wildlife and livestock.

13. Pacific will locate the proposed transmission line facilities when feasible to avoid destruction of archaeological, paleontological or historic values. In the event archaeological, paleontological, or historical evidence is found during ground disturbing activities such as construction of temporary access roads, tower footings, pulling pads, substations, and material sites, Pacific will immediately cease construction activity in that area and notify the BLM. Pacific will not resume construction until authorized by BLM.

14. Pacific will not conduct construction activities within 200 feet of any identified springs unless approved in writing by the BLM.

15. No artificial structure or stream channel change that may cause a permanent blockage to movement of fish will be erected or constructed. Pacific will take all reasonable precautions to protect fish as determined by the BLM.

    Unless otherwise approved in writing by the BLM, dikes or cofferdams, if required, will be installed to separate concrete work areas from lakes or streams during construction. Mobile ground equipment will be kept out of the waters of lakes, streams or rivers except as permitted by the BLM.

16. Pacific will conduct all construction, operation and maintenance activities in a manner that will avoid or minimize degradation of air, land, and water quality. Toxic material will not be released in any lake or water drainage. All construction work and subsequent use of the right-of-way will be consistent with applicable federal, state and local laws and regulations relating to safety, water quality and public health.

17. If Pacific requires materials for construction purposes from the public lands, application will be made under applicable regulations for such materials. Material will not be removed by Pacific without the written approval of the BLM.

18. When necessary during construction, Pacific will provide warnings, flag men, barricades and other safety measures to protect from hazards associated with the project.

19. All construction and vehicular traffic will be confined to the right-of-way or designated access routes, roads or trails unless otherwise authorized by the BLM in writing. All temporary work roads to be used for construction will be rehabilitated after construction of the Line in accordance with the approved rehabilitation plan. All permanent access roads on public lands will be restored to conditions acceptable to BLM. Any drainage deficiencies will be corrected to reduce future soil erosion.

20. Culverts or bridges will be designed to carry a reasonable peak flow if required for temporary roads crossing water courses, unless waived by the BLM. Stream channels will be restored as close as possible to the original condition if culverts and bridges are removed after construction.

21. Pacific will work closely with representatives of all governing agencies in solving access road problems.

22. Pacific will minimize disturbance to existing fences and other improvements on public lands. Pacific will promptly restore any damaged improvements to at least their former state. Functional use of these improvements will be maintained at all times. When necessary to pass through a fence line, the fence will be braced on both sides of the passageway prior to cutting of the fence. Stress panels or rock jacks will be constructed and installed according to BLM standards. Gates will be installed during construction and will be closed at all times when not in use. When a road or construction activity breaks or destroys a natural barrier used for livestock control, the gap thus opened will be fenced to prevent drift of livestock. When construction has been completed, the BLM will identify the gates which Pacific will replace with a stationary section of fence.

23. Pacific will ground all permanent gates, cattleguards or other objects or structures that could become inadvertently charged with electricity.

24. Right-of-way clearing in timbered and scenic areas will be done in accordance with an approved clearing plan and will be limited to a minimum width necessary to prevent interference of trees and other vegetation with the transmission facilities. If any merchantable timber is involved in right-of-way clearing it will be harvested in accordance with the terms of a BLM timber sale contract.

25. No water sources on federal lands will be utilized without written permission of the BLM.

26. Reasonable precuations will be taken to protect, in place, all public land survey monuments, private property corners, and forest boundary markers.

27. Fully contained sanitation facilities in personnel and material marshalling areas will be installed. Construction personnel will be required to utilize existing sanitary facilities where possible. All waste from temporary sanitary facilities will be transferred in appropriate containers to an approved disposal area.

28. The line will be designed to reduce electric and audible noises from operation to practial levels. The transmission line will be designed to meet requirements of the National Electric Safety Code.

29. The transmission line and associated facilities will be maintained to standards of repair and safety criteria acceptable to the applicable regulatory agencies having jurisdiction.

30. Noise producing equipment will be located to minimize sound radiating to the surrounding areas. If usage of pneumatic-tools or equipment used in chipping operations during tree removal or trimming is necessary near residential properties, such use will be restricted to daylight hours.

31. During construction, water trucks will be used to control dust where necessary or desirable in the vicinity of neighboring residents or agricultural developments.

32. Contact will be attempted with directly affected property owners and residents to inform them of the planned project and what may be expected during each construction phase, such as the hours of operation and types of construction equipment that would be used in the area.

33. Prior to construction, Pacific will measure radio and television signals, along with ambient RF signal noise levels at residences and commercial establishments located near the line route. Pacific will restore the reception of radio and television at residences and commercial establishments in the primary reception area to the level present prior to operation of the line. This restoration will occur at no cost to residents experiencing interference resulting from operation of the line.

PACIFIC POWER & LIGHT COMPANY
920 S.W. SIXTH AVENUE • PORTLAND, OREGON 97204 • (503) 243-1122

April 12, 1982

Mr. Phillip C. Hamilton
Chief of Planning and Environmental
Coordination
Bureau of Land Management
P. O. Box 2965
Portland, OR 97208

Dear Mr. Hamilton:

As a result of our review of the preliminary draft EIS and discussions on March 29 and 30, Pacific Power & Light Company will commit to do the following actions identified as possible mitigation measures in the PDEIS.

1. Pacific will use non-reflective conductors from Spencer Switching Station to Dixonville south to the Canyonville bypass. Non-reflective conductors will also be used from the point where the proposed line enters the Evans Creek Valley south and east to the Meridian Substation.

2. Pacific will use non-reflective tower steel in the following areas:

   From the North Umpqua River to the North Umpqua highway and into Dixonville if Option D is not selected; along Option E; along Option I and M through Sam's Valley to the Rogue River and then east of Crater Lake highway to Meridian; along H and L from Lyman Mountain to the Rogue River and then from Crater Lake highway to Meridian; and along the Rogue Valley crossing on the preferred alternative and Alternative K.

3. Pacific will establish through selective clearing and a vegetation planting program a screen of vegetation on the banks of the selected Rogue River crossing.

4. It is recognized that construction activities could interfere with Columbia white-tailed deer fawning near the North Umpqua River. However, current construction schedules do not contemplate being within one mile of the North Umpqua River crossing between May 15 and July 15 as construction would proceed from north to south. If, due to unforeseen circumstances, this schedule could not be used, Pacific would agree to a determination by the Oregon Department of Fish and Wildlife upon their review, prior to construction, that construction should be suspended during this time period.

5. Once initial detailed engineering designs are completed and access roads and construction pads and tower locations are identified, Pacific will agree to an on-the-ground review by qualified botanists. Following their review, Pacific will modify these plans as appropriate to avoid adversely affecting *Phacelia capitata*, *Sidalcea campestris* and *Limnanthes floccusa* sp. *Grandaflora*. All construction workers will

be required to confine their activities to identified construction areas. If existing structures are removed, they will be removed in a manner that would avoid adversely affecting these species. Herbicides will not be used in these areas. For those areas of the selected route that have not been surveyed for endangered and threatened plant species but which have a high likelihood of containing the requisite habitat, similar on-the-ground investigations would be conducted in those areas and plans would be modified as appropriate.

6. On areas of the selected route which have a high likelihood of containing archaeological resources, on-the-ground surveys will be conducted by a qualified archaeologist and any sites so found will be handled in accordance with previously established procedures.

7. If the preferred alternative is selected for the corresponding portions of Option E (Canyonville), F (Green Mountain), and G (West Fork Evans Creek), Pacific will relinguish its easements for those areas with the exceptions of the easements north of the section line between sections 35 and 2; Township 30 South, Range 5 West, (Option E). Pacific will retain its easements through Sam's Valley for future local requirements.

We trust that the analysis of the environmental effects of our proposal would reflect these commitments.

Sincerely,

Paul D. Higgins

Paul D. Higgins
Project Manager

PDH/ka

cc: Peter Paquet
Bob Beraud
Bill Kitto

APPENDIX B

APPENDIX B

EXISTING VISUAL AND LAND USE CONDITIONS ALONG OPTIONS B, C, D, AND NEW ALIGNMENTS IN THE MEDFORD BASIN

This appendix describes the existing visual and land use conditions on those segments of the alternatives and options near Eugene, Roseburg, and Medford which do not follow the alignment of the existing 230 kV line from Spencer Switching Station to Meridian Substation. The Technical Investigations Report describes the baseline conditions along the existing corridor and the description of these segments follows the format used in that report even though this appendix analyzes both existing and potential corridors. Detailed area-wide analyses of conditions in the Eugene and Medford areas are covered in the Routing Study Report.

OPTION B: TWIN OAKS/SPENCER CREEK/HILLS BETWEEN SPENCER BUTTE AND CAMAS SWALE

This route option extends south from Twin Oaks across Spencer Creek Valley through the hills south and west of Fox Hollow Road to a point north of Camas Swale Road where it enters the narrow creek valley (approximate length 7 miles).

Visual Character, Topography, and Landform: Throughout this area, the line passes through the gently rounded hills south of Spencer Butte and Eugene. Spencer Creek, approximately 1 mile south of Twin Oaks, drains a broad, shallow valley. With the exception of this valley and the southern end of the segment, the land is hilly and views are not extensive. Where the line joins the existing corridor at the south end of this route option, it enters Camas Swale Creek Valley at the point where the valley opens to the western, gently sloping edge of Camas Swale, a broad, flat, open plain. The last 1 to 1 1/2 miles of this segment are parallel to the narrow Camas Swale Creek valley across the face of the hills to its north.

Vegetation and Land Use: The majority of the area through which this segment of the line passess is covered by forest, much of which has been logged recently. This forest is almost entirely Douglas fir and varies from recently cleared or young growth areas to smaller areas of mature growth. This forest has a closed and dense visual character in comparison with the more open mixed deciduous and evergreen woods that are common in the vicinity of Roseburg and the Medford Basin. Spencer Creek valley and Camas Swale contain the most extensive open areas along this segment. Both of these valleys are extensively farmed for crops and hay, but fields in the former valley are considerably smaller. Between these two open areas, the route crosses or passes along the edge of several small clearings which are occupied by residences. Throughout much of this segment, land uses are changing

from agriculture and forestry to rural residential development. This is particularly common along the roads that give convenient access to Eugene.

Visibility of Line from Roads: The proposed line crosses McBeth Road a short distance south of where it joins Lorane Highway and Fox Hollow Road near its intersection with McBeth Road. The former crossing will be more visible than the latter, as it occurs in Spencer Creek Valley, but views will be limited by the trees and the surrounding slopes. The Fox Hollow crossing is proposed in a densely wooded area where the road winds considerably, so views of the crossing will be restricted to a short length of the road. The line will also be partially visible from Camas Swale Road which runs along the south side of the creek valley. Intervening riparian vegetation and trees on the lower slopes of the valley will help obscure the line, which will be approximately 1 mile away on the other side of the valley.

Visibility of Line from Houses: At the proposed crossing of McBeth Road there are only 2 houses within 1000 feet of the line, both near the outer limit of this zone. There are no houses at the proposed crossing of Fox Hollow Road. In several locations where the line runs approximately parallel to McBeth Road, the land is subdivided and lots are either for sale or houses are under construction within the 1000 foot zone. There are also approximately 6-8 existing houses within this 1000 foot zone between Spencer Creek and Camas Swale.

Visibility of Line from Parks: At its closest point, the proposed line is over 1 1/2 miles from the top of Spencer Butte and is generally over 2 miles distant. It is possible that portions of towers may be visible from that park, but these will be minor elements in the panoramic 360° view from the top of this hill.

BLM Management Class Designation: There are no BLM lands along this route option and BLM has not developed Visual Resource Management classes for this area.

OPTION C: SPENCER SWITCHING STATION/ALVEY SUBSTATION

This route option traverses the short distance between the switching station and the substation (approximate length, 2 miles).

Visual Character, Topography, and Landform: Almost the entire length of this option is located in the hills southeast of Eugene and northwest of Camas Swale. Alvey Substation, however, is located on flat land at the base of these hills. the hills are generally low, gently sloped, and rounded in this area, although the hillside immediately west of Alvey is steeper than other parts of this segment.

Vegetation and Land Use: The existing corridor is located between the forested upper slopes of the hills to the north and the open pastureland to the south. These pastures are interspersed with woodlands and scrub vegetation appears to be spreading into them. At the eastern end of the route option, where the line bends to the northeast, it crosses a low ridge covered with open woodlands before dropping down into the substation. To the north and east of the substation are Highway 99 and Interstate 5. To the immediate south is a low, isolated hill which separates the substation from a large lumber mill and other industrial and commercial development along Highway 99.

Visibility of Line from Road: Alvey Substation is clearly visible from Highway 99 and Interstate 5, as it is adjacent to both of these highways. The Interstate is elevated at this point, passing over Highway 99, and travellers can look down onto the large expanse of the substation. A large number of existing transmission lines, supported on a variety of structures including steel lattice towers and wood poles, now enter Alvey Substation from the east and west. Curves in both highways and the isolated low hills to the north and south combine to ensure that views of the substation and associated transmission lines only occur for a relatively short length of time. Nevertheless, this segment of the line and the substation are the places where the proposed Eugene-Medford line would be closest to I-5 and most visibile from this designated scenic highway.

Visibility of Line from Houses: There are no houses within 1000 feet of the line along this route option. It is probable that 3 or 4 houses in Camas Swale may have views of the line but their distance from the line and orientation would make the line a relatively minor feature in their views.

Visibility of Line from Parks: Mt. Pisgah, which includes Howard Buford Park, is located 2 miles to the east of Alvey Substation. The line entering Alvey would be visible from parts of this park but would be screened from view from most of the mountain. Because of distance and the presence of other lines in the area, an additional line would be a very minor feature in these views.

BLM Management Class Designation: There is no BLM land in this area and no Visual Resource Management class designations have been made.

OPTION D: NORTH UMPQUA HIGHWAY BYPASS/DIXONVILLE SUBSTATION

This route extends almost due south from the North Umpqua River across State Highway 138 and bends to the southwest into Dixonville Substation (approximate length, 5 miles).

Visual Character, Topography and Landform: This route option was identified as an alternative to the existing alignment to reduce the

visibility of the line from Highway 138; for much of its length it follows the alignment of PPL Line 39. The option diverges from the existing alignment of the Alvey-Dixonville line at the angle point in Oak Creek Valley to the north of Route 138 and proceeds south across the road at almost a right angle into a narrow valley between two parallel ridges running approximately north-south. The route option then follows the alignment of Pacific's Line 39 through this narrow valley into the open valley of the North Fork of Deer Creek in which the Dixonville Substation is located. For almost its entire length, this option is located on the lower east face of a smooth, rounded, long ridgeline which separates it from the valley in which the North Umpqua Highway is located and conceals it from views along this heavily travelled recreation route.

Vegetation and Land Use: The vegetation in this area consists of grassland, open oak woodland, and scattered blocks of fir forest on the ridge to the east of the line. The southern half of the line passes through grassland which covers the ridge to the west and the valley floor of Deer Creek. The length of the line to the north of the North Umpqua Highway is located in scrub oak woods, while south of the highway it crosses open fields.

Visibility of Line from Roads: This section of the line would cross Highway 138 and two small county roads in the vicinity of Dixonville. The point at which the line would cross the highway is on a low, flat section of the road which is visible for only a brief time. This crossing point is far less visible than the existing Alvey-Dixonville line which runs parallel to the highway for nearly 4 miles. The visibility of the line at the road crossing at Dixonville will be very similar to that of the existing corridor since it is located very close to that crossing point.

Visibility of Line from Houses: Option D would be located within 1000 feet of 2-4 farms at the North Umpqua Highway crossing but would not be close to any other residences for the length south to Dixonville Substation.

Visibility of Line from Parks: There are no parks in the vicinity of this option.

BLM Management Class Designation: There is no BLM Visual Resource Management data for this area.

OPTION H, L: WEST ROUTE, MEDFORD BASIN

This route option is a new right-of-way which would extend from Ramsey Canyon southwest along a ridge to the west of Sams Valley to Lyman Mountain. From there it would extend east across Route 234 (Sams Valley Road) and join an existing line running east into Table Rock

Switching Station. From that point it follows the existing alignment to Meridian Substation as described in the Technical Investigations Report (approximate length from Ramsey Canyon to Table Rock Switching Station, 13 miles).

Visual Character, Topography and Landform: For most of its length, this route option is located in the rugged hills to the north and west of Sams Valley. These hills are composed of steep-sided, narrow-topped ridges and spurs. The line is located near the crest of, and approximately parallel to, the first ridgeline west of the valley. The line descends to the main valley floor down a draw or gulch on Lyman Mountain and then runs east across the valley, parallel to Route 234, into Table Rock Switching Station.

Vegetation and Land Use: The mountainous portion of the route option is entirely wooded, although the canopy cover varies considerably due to logging throughout this area. In few locations are the trees very tall. The section of the line in the Medford Basin is mostly located among open oak woods, although at one point it runs across a large pasture. The switching station is located at the base of the north scree slope of Lower Table Rock, which is also covered by open oak scrub.

Visibility of Line from Roads: The proposed line crosses Sams Valley Road (Route 234) at the point where this road leaves Sams Valley and bends southwest into the narrow valley of the Rogue River. At this point views are constricted by topography and vegetation. The road crossing at which an existing line is briefly visible, is rather inconspicuous. The line would also be visible at the base of Lower Table Rock from Route 234 east of the crossing and from other local roads in Sams Valley. The section from Lyman Mountain to the switching station runs almost parallel to and about 1/2 mile south of Route 234 and would not be screened in views from that road by vegetation or topography. If the portion of the line through the mountains were located along the crest of the ridge west of the valley or on the east facing slope of this ridge, then this segment would also be visible on the western skyline from most locations in Sams Valley. If the line were located on the west-facing slope of this ridge, this segment would be screened from view from Sams Valley.

Visibility of Line from Houses: The only locations in which houses are within 1000 feet of the line are at the crossing of Route 234, where 2 ranches are located, and a short distance to the east of this crossing, where another farm is located at the edge of this zone. The discussion of the visibility of the line from roads in Sams Valley also applies to houses in the valley. Houses and farms located along Sams Valley Road would have views of the east-west portion of the line between 1/2 and 1 mile to the south, while more distant views of the portion of the line in the hills to the west would be had by many of the houses in the valley.

Visibility of Line from Parks: This section of the line would be visible from Lower Table Rock and also, at a distance of 3 to 6 miles, from Upper Table Rock. A portion of the former rock is a Nature Conservancy Reserve, while both Rocks are under consideration for designation as Areas of Critical Environmental Concern by BLM. The proximity of the switching station to the north end of Lower Table Rock will make it and the line entering it from the west a clearly visible feature in views from the north rim of this plateau. However, because the alignment is located approximately 600 feet below the elevation of the rock, the segment close to the rock will not be visible from most of the top of either Table Rock. There will be more distant views of the line on the ridge to the north and west of Sams Valley, but this line will be over 4 miles from Lower Table Rock and if the line is not located on the crest of the ridge it is unlikely to be a dominant feature in views from this natural feature.

BLM Management Class Designation: The primary BLM concern in this area is with the proposed Areas of Critical Environmental Concern on the two Table Rocks, which have been discussed above.

DRAFT PREFERRED ALTERNATIVE AND OPTION K: RAMSEY CANYON/HILLS NORTH AND EAST OF MEDFORD BASIN/ROGUE RIVER

This section of the draft preferred alternative would be on a new right-of-way, which passes north and east of the Medford Basin and enters Meridian Substation from the northeast (approximate length, 27 miles).

Visual Character, Topography and Landform: With the exception of several small valleys, which this segment of the line crosses, all of this area is within hilly or rugged topography.

East of Ramsey Canyon the route crosses the southern edge of a gently sloping or rolling area which drains into Evans Creek and then travels eastward to the Rogue River through moderately steep ridges with elevations up to 2,500 feet. The Rogue River Valley in the vicinity of the crossing is approximately 1 1/2 miles wide, with the river running close to the western edge of the flat valley floor. East of the river valley the hills are higher but less dissected and slopes are generally less steep, although there are also areas of steep topography here. Where the line crosses Little Butte Creek and Highway 140, there is a narrow valley with a flat floor approximately 1/2 mile wide. To the south, the topography again becomes steeper and more varied. The route crosses two more small valleys at Yankee Creek and Antelope Creek; in the first valley, there is a small reservoir to the west of the proposed corridor. Meridian Substation is located towards the upper end of Dry Creek valley, with Roxy Ann Peak (elevation 3,571) to the west and high hills to the east.

Vegetation and Land Use: With the exception of the valleys described above, this section of the line is located among hills which are sparsely wooded. These woods are predominantly oak with some evergreen trees and contain frequent open areas with scattered small trees. Portions of these wooded hills are used as rangeland and there are subdivisions located in the hills to the west of the Rogue River Valley, to the north of the Highway 140 crossing, and on the ridge between Antelope Creek and Meridian Substation. Lots in these subdivisions are large and houses are scattered, rather than clustered. In the gently sloping areas and flat valley floors along this route, there are hay fields and occasional croplands. This farming pattern occurs to the west of Ramsey Canyon in the open valley bottom near Evans Creek, in the Rogue River Valley, and in Little Butte, Yankee, and Antelope Creek Valleys.

Visibility of the Line from Roads: This section of the proposed line crosses two major roads, State Routes 62 and 140, and many local roads including roads in the Evans Creek area, Rogue River Drive, Butte Falls Road, and Antelope Road. The line would be clearly visible from all of these roads; however, the length of time for which it is visible will not be very long except at Antelope Creek Road, which is long and relatively straight to the west of the road crossing point. The Environmental Impact Statement discusses the visibility of the line from Crater Lake Highway (Route 62) and Rogue River Drive in detail.

Visibility of Line from Houses: There are houses scattered throughout this area, both in the subdivisions described above and along many of the roads. Where the route passes through the open area near Evans Creek, there are approximately 4 or 5 houses within 1000 feet of the line. At the Rogue River Crossing there are 3-4 houses within 1000 feet of the line on the west bank of the river and 3 houses between Crater Lake Highway and the river. On the east side of the highway as the line climbs over a low spur, there is one house at the outer edge of this zone. From there south, there are no houses close to the line until it reaches Brownsboro. In this area of scattered houses north of Highway 140, there are 3 or 4 residences within 1000 feet of the line. South of 140, there are 3 houses very close to the line. Houses at Yankee Reservoir are located on the west side of the reservoir, while the line passes to its east. Between Antelope Creek and the Meridian Substation, a few houses are scattered over the east side of the ridge and 3-4 residences are within 1000 feet of the proposed transmission route.

Visibility of Line from Parks: This segment would be visible from two parks, Takelma and Roxy Anne Peak. The latter would only have distant views of the line, 1 1/2 to 2 1/2 miles away as it enters Meridian Substation.

The north end of the former park is located within 1000 feet of the proposed line, on the west bank of the Rogue. As it descends the

hillside to the west of the park, crosses a narrow pasture at the Rogue River, and enters the mature riparian woods on the east side of the river, this segment of the line would be clearly visible from many places within this park, including its river frontage and a small boat launch ramp. This park is presently undeveloped but is well-used by fishermen and as a place to launch boats for river floating. The existing riparian woods that cover much of the park help screen views to the north, but the northern end of the park, which is closest to the proposed alignment, is an open field with relatively unobstructed views.

BLM Management Class Designation: This section of line passess through areas designated as Class II, III, and IV. The Class II areas are defined by the viewshed of the Rogue River and include approximately 4.5 miles of the route as it crosses this valley and turns southeast over a low ridge. The Class III areas are defined by the viewshed of the Little Butte Creek Valley. The proposed line crosses this valley and Highway 140, which runs down its length, a short distance to the east of Brownsboro. Just under 4 miles of the route are located in this Class III management area. The remaining 18 to 19 miles of this section of the proposed line are located in Class IV areas.

APPENDIX C

FIGURE C-1: EXISTING VIEW OF TWIN OAKS-SPENCER CORRIDOR AND SOUTH HILLS FROM RIDGELINE TRAIL (DILLARD ROAD, EUGENE, LOOKING WEST).

FIGURE C-2: VIEW OF DRAFT PREFERRED ALTERNATIVE IN TWIN OAKS-SPENCER CORRIDOR FROM RIDGELINE TRAIL.

FIGURE C-3: EXISTING VIEW OF SPENCER-DIXONVILLE CORRIDOR FROM STREET IN AN ADJACENT SUBDIVISION (COTTAGE GROVE AREA, LOOKING NORTH).

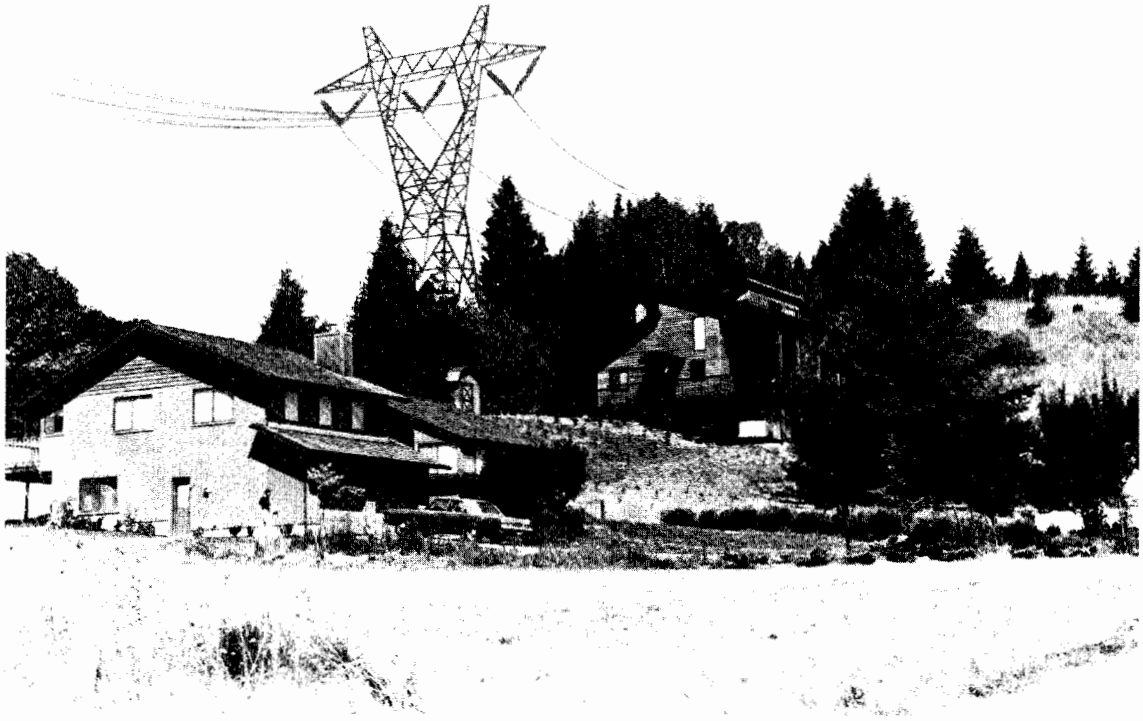

FIGURE C-4: SIMULATED VIEW OF DRAFT OR NEW PREFERRED ALTERNATIVE IN SPENCER-DIXONVILLE CORRIDOR FROM STREET IN AN ADJACENT SUBDIVISION.

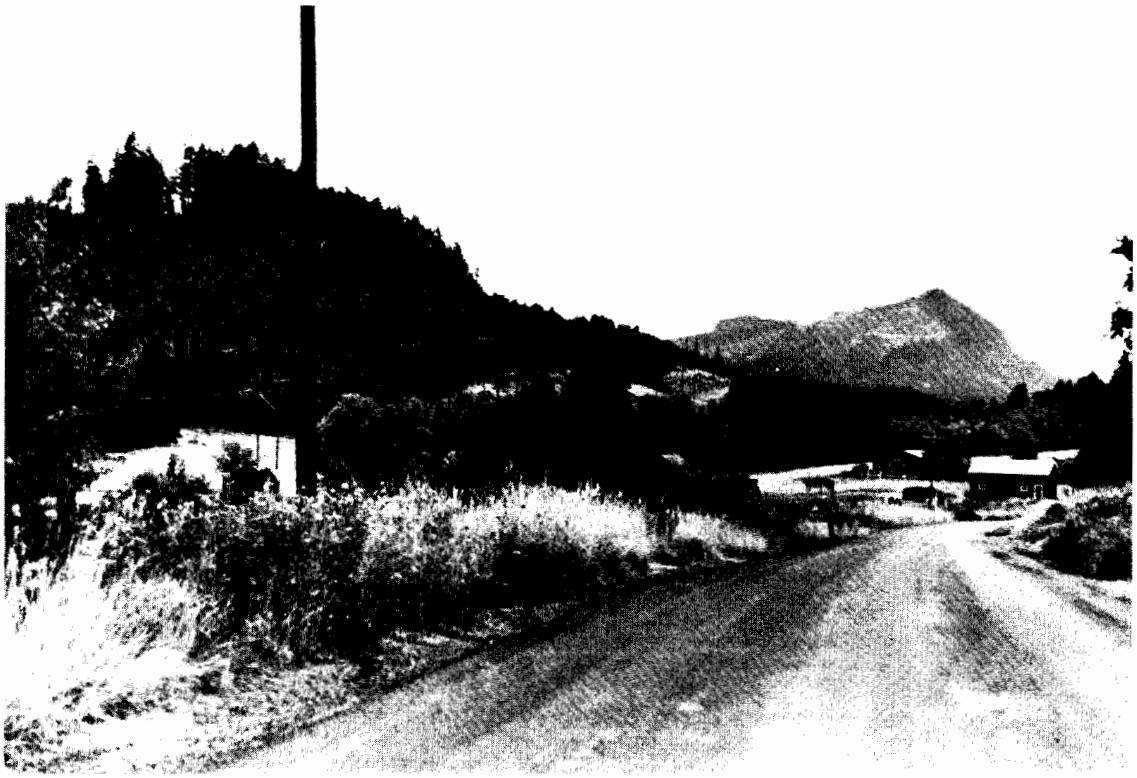

FIGURE C-5: EXISTING VIEW OF TYPICAL FORESTED SECTION OF SPENCER-DIXONVILLE CORRIDOR (ELKHEAD, LOOKING SOUTH).

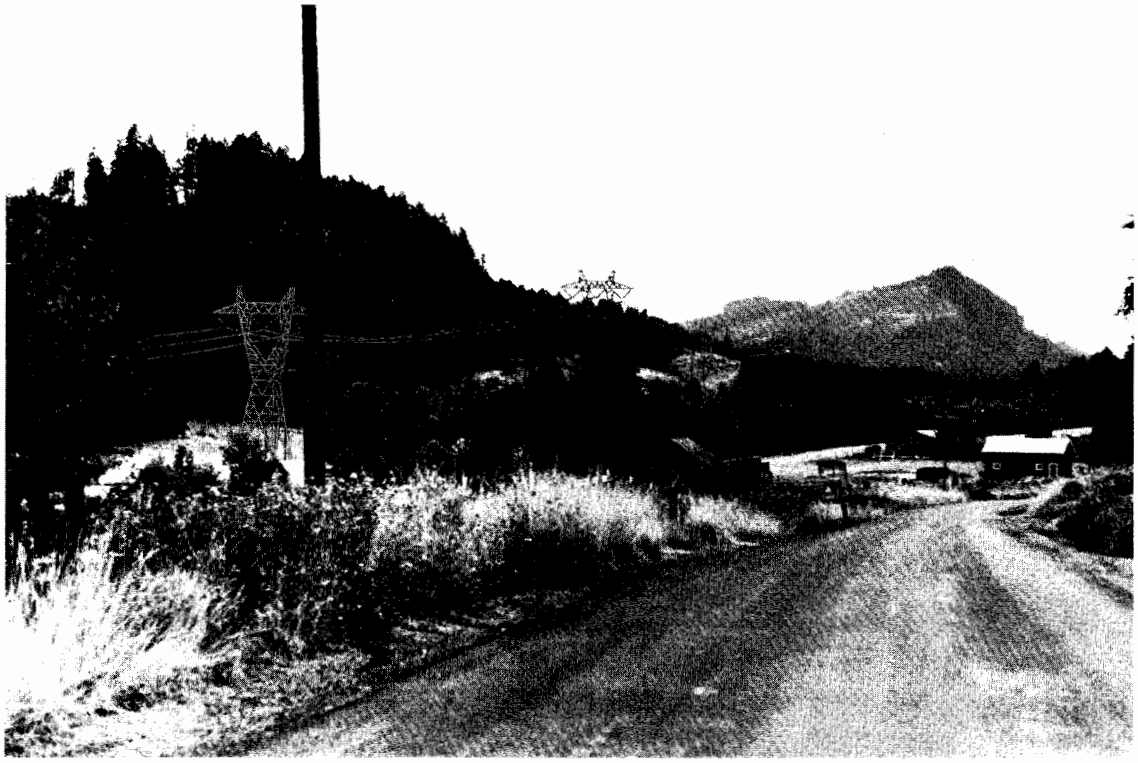

FIGURE C-6: SIMULATED VIEW OF DRAFT OR NEW PREFERRED ALTERNATIVE IN TYPICAL FORESTED SECTION OF SPENCER-DIXONVILLE CORRIDOR.

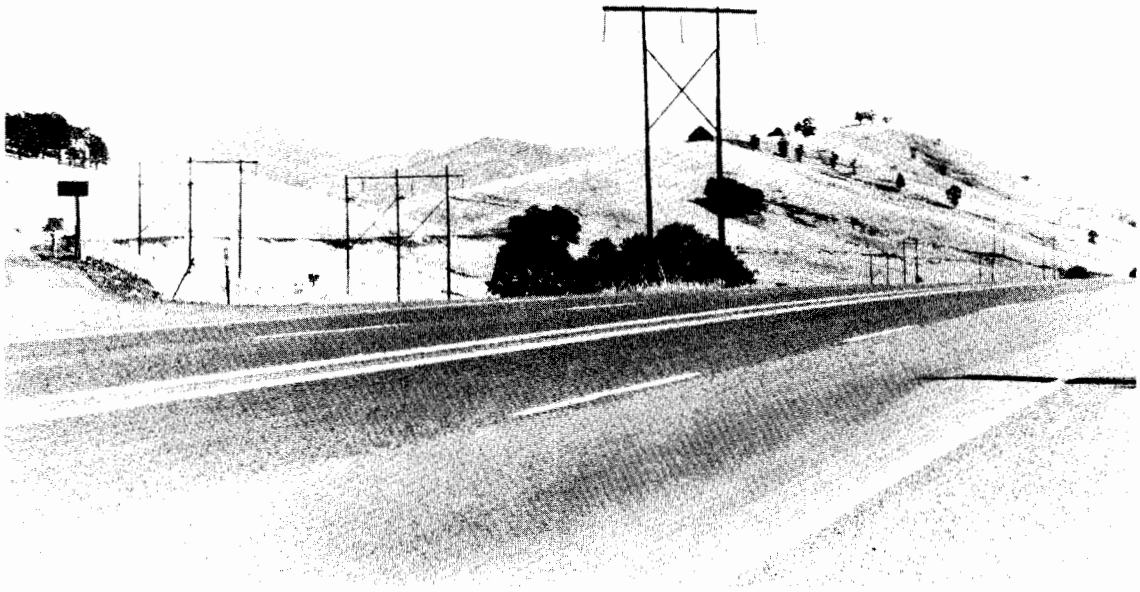

FIGURE C-7: EXISTING VIEW OF SPENCER-DIXONVILLE CORRIDOR ALONG NORTH UMPQUA HIGHWAY (LOOKING SOUTH TOWARD DIXONVILLE).

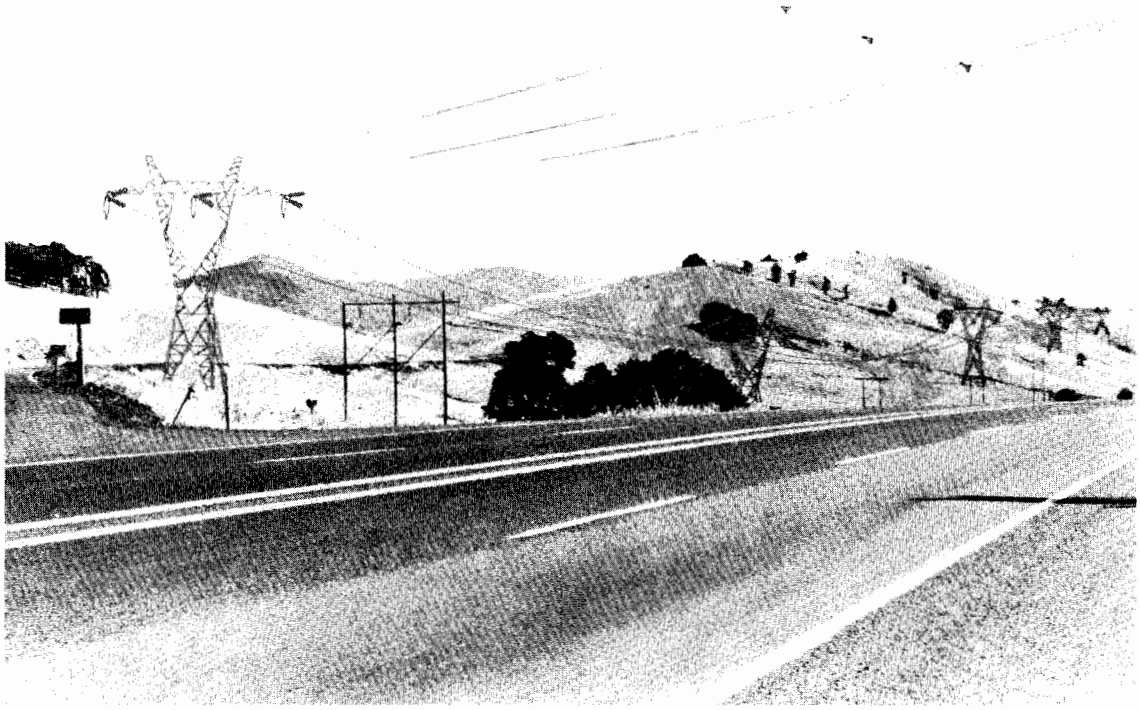

FIGURE C-8: SIMULATED VIEW OF DRAFT OR NEW PREFERRED ALTERNATIVE ALONG NORTH UMPQUA HIGHWAY (SINGLE CIRCUIT STEEL LATTICE STRUCTURES).

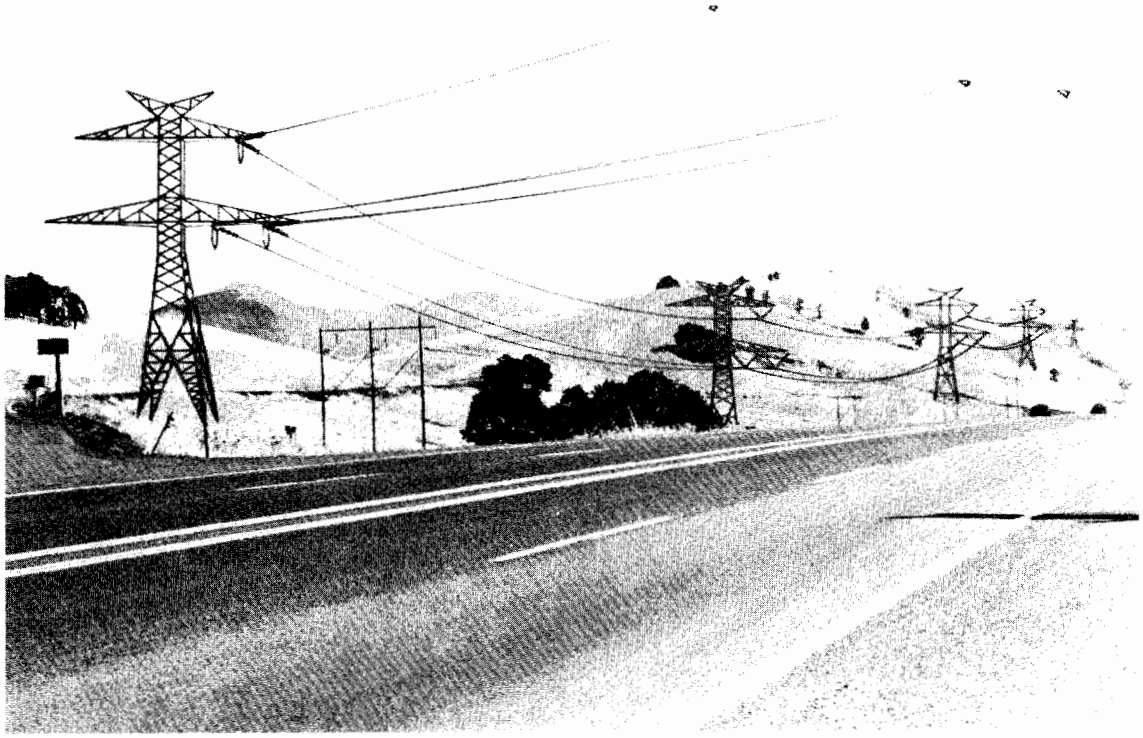

FIGURE C-9: SIMULATED VIEW OF ALTERNATIVE THREE ALONG NORTH UMPQUA HIGHWAY (DOUBLE CIRCUIT STEEL LATTICE STRUCTURES).

FIGURE C-10: SIMULATED VIEW OF REHABILITATED CORRIDOR ALONG NORTH UMPQUA HIGHWAY IF OPTION D IS ADOPTED.

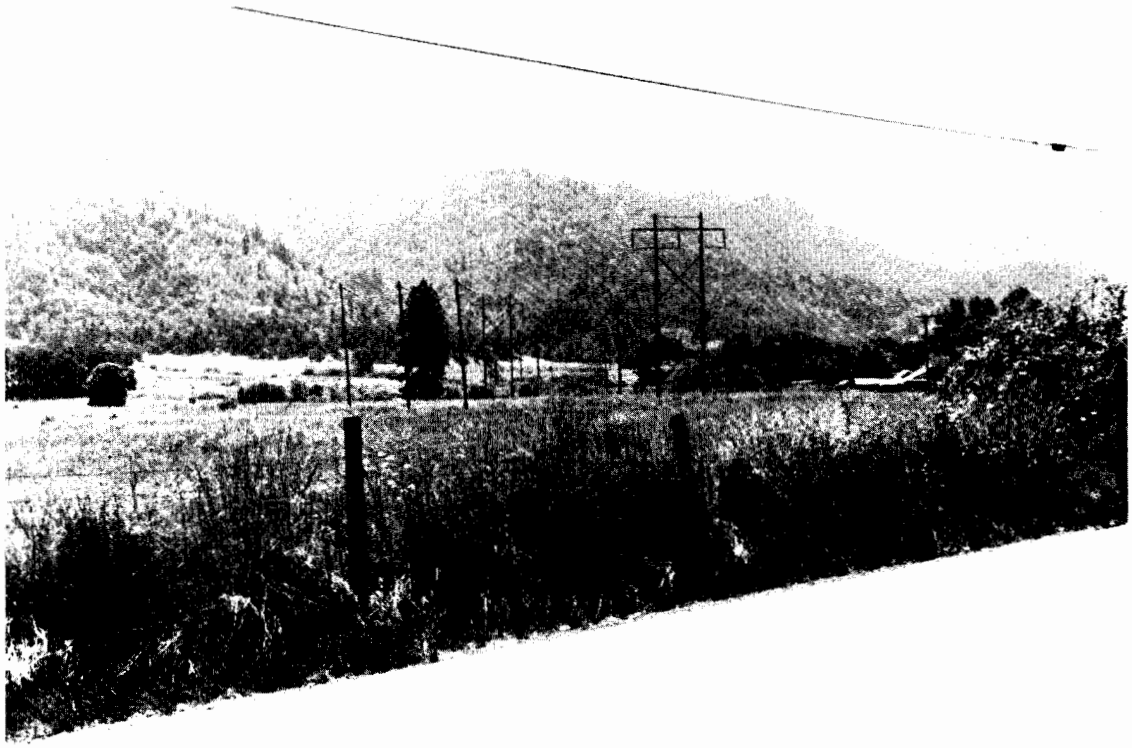

FIGURE C-11: EXISTING VIEW OF TYPICAL FARMLAND SECTION OF SPENCER-DIXONVILLE CORRIDOR (SOUTH UMPQUA VALLEY, LOOKING SOUTH).

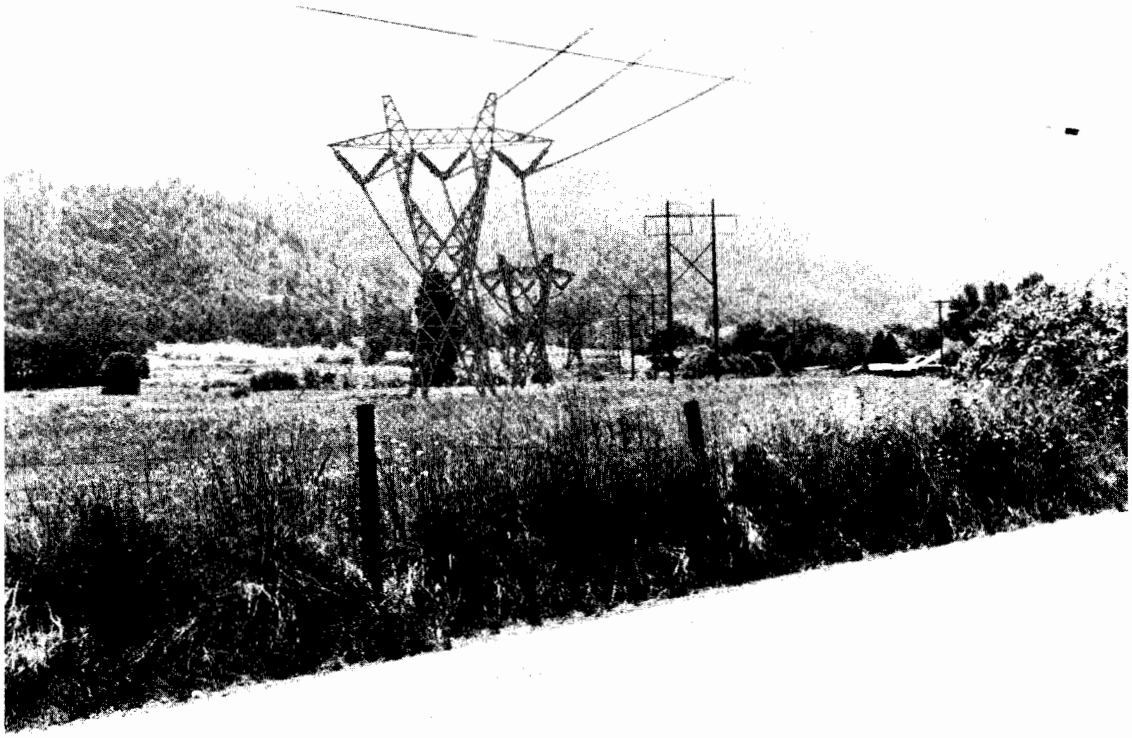

FIGURE C-12: SIMULATED VIEW OF DRAFT OR NEW PREFERRED ALTERNATIVE IN TYPICAL FARMLAND SECTION OF SPENCER-DIXONVILLE CORRIDOR.

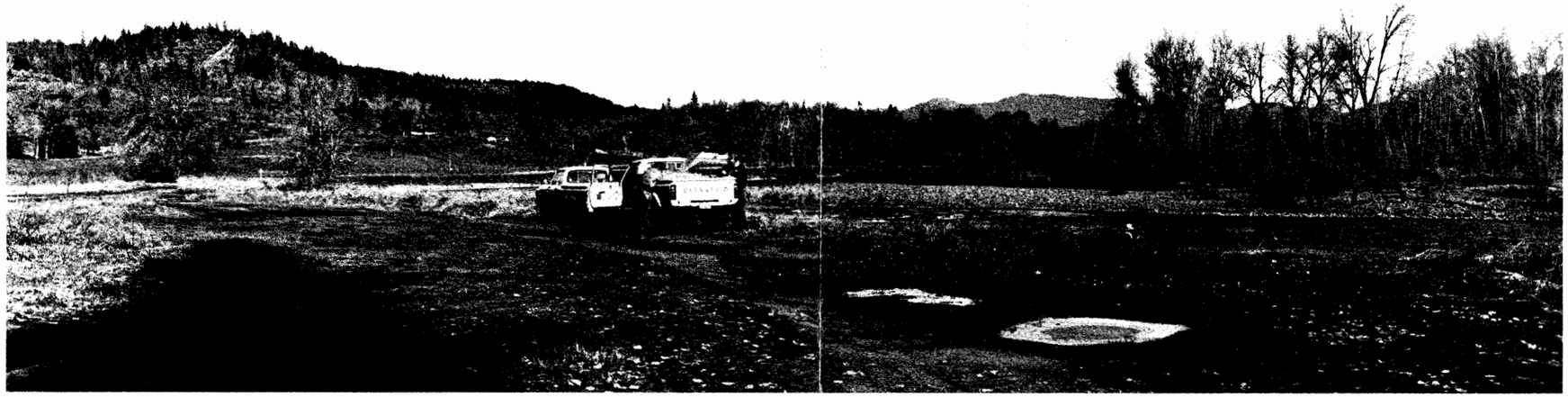

FIGURE C-13: EXISTING VIEW OF ROGUE RIVER NEAR SHADY COVE (PARKING AREA AT TAKELMA PARK, LOOKING NORTH).

FIGURE C-14: SIMULATED VIEW OF DRAFT PREFERRED ALTERNATIVE AT ROGUE RIVER CROSSING (SINGLE CIRCUIT STEEL LATTICE STRUCTURES). IN ACCORDANCE WITH A PLANTING PLAN TO BE NEGOTIATED WITH THE JACKSON PARKS AND RECREATION DEPARTMENT, TREES AND SHRUBS WOULD BE PLANTED TO HELP SCREEN THE LINE FROM RECREATION ACTIVITY AREAS.

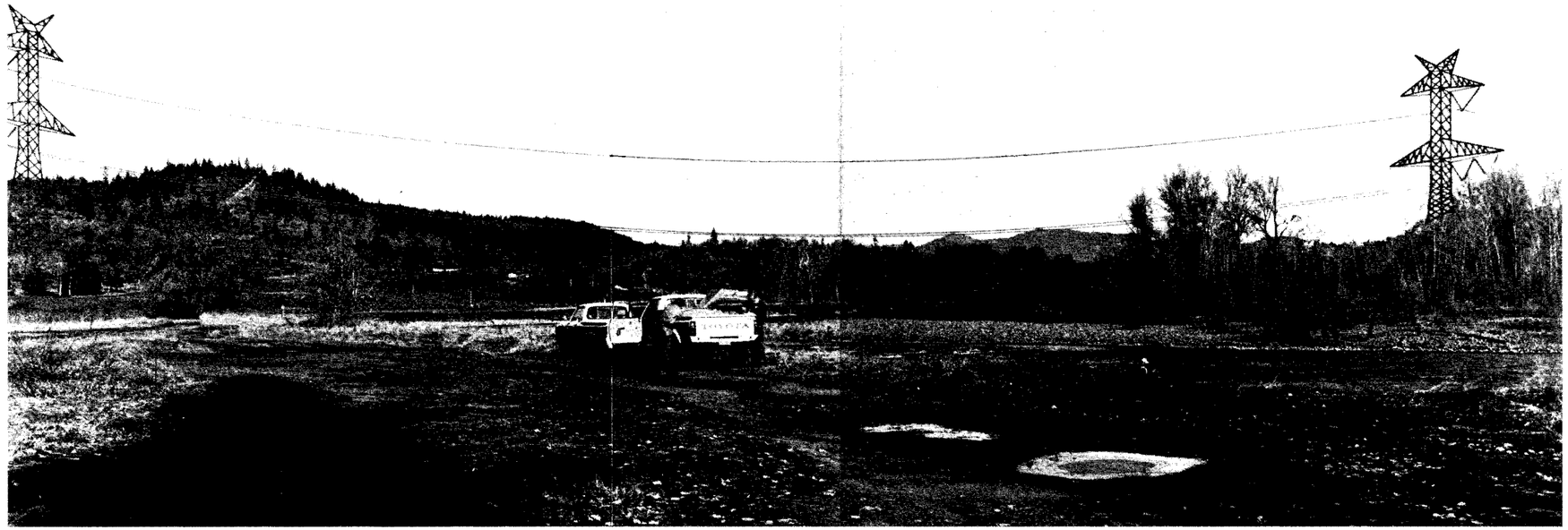

FIGURE C-15: SIMULATED VIEW OF ALTERNATIVE THREE AT ROGUE RIVER CROSSING (DOUBLE CIRCUIT STEEL LATTICE STRUCTURES). IN ACCORDANCE WITH A PLANTING PLAN TO BE NEGOTIATED WITH THE JACKSON PARKS AND RECREATION DEPARTMENT, TREES AND SHRUBS WOULD BE PLANTED TO HELP SCREEN THE LINE FROM RECREATION ACTIVITY AREAS.

FIGURE C-16: SIMULATED VIEW OF DRAFT PREFERRED ALTERNATIVE AT ROGUE RIVER CROSSING, ILLUSTRATING THE POSSIBLE USE OF TUBULAR STEEL STRUCTURES TO REDUCE VISUAL IMPACTS. IN ACCORDANCE WITH A PLANTING PLAN TO BE NEGOTIATED WITH THE JACKSON PARKS AND RECREATION DEPARTMENT, TREES AND SHRUBS WOULD BE PLANTED TO HELP SCREEN THE LINE FROM RECREATION ACTIVITY AREAS.

FIGURE C-17: EXISTING VIEW OF CRATER LAKE HIGHWAY BETWEEN EAGLE POINT AND SHADY COVE (LOOKING NORTH).

FIGURE C-18: SIMULATED VIEW OF DRAFT PREFERRED ALTERNATIVE AT CRATER LAKE HIGHWAY CROSSING.

FIGURE C-19: EXISTING VIEW OF SAMS VALLEY SECTION OF EXISTING CORRIDOR (SAMS VALLEY ROAD, LOOKING NORTH).

FIGURE C-20: SIMULATED VIEW OF OPTION I IN SAMS VALLEY SECTION OF EXISTING CORRIDOR (SINGLE CIRCUIT TUBULAR STEEL STRUCTURES).

FIGURE C-21: SIMULATED VIEW OF OPTION M IN SAMS VALLEY SECTION OF EXISTING CORRIDOR (DOUBLE CIRCUIT STEEL LATTICE STRUCTURES).

FIGURE C-22: EXISTING VIEW OF WHITE CITY SECTION OF EXISTING CORRIDOR (JUNCTION OF ROUTE 140 AND CRATER LAKE HIGHWAY, LOOKING EAST).

FIGURE C-23: SIMULATED VIEW OF OPTIONS H AND I IN WHITE CITY SECTION OF EXISTING CORRIDOR (SINGLE CIRCUIT TUBULAR STEEL STRUCTURES).

FIGURE C-24: SIMULATED VIEW OF OPTIONS L AND M IN WHITE CITY SECTION OF EXISTING CORRIDOR (DOUBLE CIRCUIT STEEL LATTICE STRUCTURES).

APPENDIX D

MEMORANDUM OF UNDERSTANDING (MOU)

BETWEEN

UNITED STATES DEPARTMENT OF INTERIOR
BUREAU OF LAND MANAGEMENT

UNITED STATES DEPARTMENT OF ENERGY
BONNEVILLE POWER ADMINISTRATION

STATE OF OREGON
OREGON DEPARTMENT OF ENERGY

PACIFIC POWER AND LIGHT COMPANY

FOR THE

ENVIRONMENTAL IMPACT STATEMENT PREPARATION
PERTAINING TO A PROPOSED ELECTRICAL TRANSMISSION LINE
FROM EUGENE TO MEDFORD, OREGON

I. Introduction

It has been mutually decided by the Bureau of Land Management (herein referred to as BLM), and Bonneville Power Administration (herein referred to as BPA), in consultation with the Director of the Oregon Department of Energy (herein referred to as State), that an Environmental Impact Statement (EIS) will be necessary prior to the grant of a right-of-way to Pacific Power and Light Company (herein referred to as PP&L) for a proposed 500 KV transmission line from Eugene to Medford, Oregon. The EIS is intended to fulfill the requirements of Federal laws by complying with the provisions of the National Environmental Policy Act of 1969 (NEPA) and other Federal environmental laws, executive orders, and policies. In addition, to the extent possible the EIS will be designed to fulfill the requirements of the State Energy Facility Siting Council as set forth in OAR Chapter 345, Division 80.

II. Definitions

A. "Process" means jointly the NEPA process and the State Energy facility siting process.

B. "PDEIS" means Preliminary Draft Environmental Impact Statement; "DEIS" means the Draft Environmental Impact Statement; "FEIS" means the Final Environmental Impact Statement.

C. "Primary Parties" means the lead federal agency (BLM), State, and PP&L. (40 CFR 1501.5) These parties will have the final responsibility to insure that the NEPA process is adequately performed. In addition, they will also be involved as cooperating parties as in D. below.

D. "Cooperating Parties" include the primary parties plus the cooperating federal agency (BPA) (40 CFR 1501.6). These parties will cooperate, coordinate, provide expertise, technical review, and consolidate procedures to establish efficiency in the Process.

E. "Scoping" means an early and open procedure for determining the alternatives to be addressed in the EIS; for identifying the significant issues related to the proposed action and alternatives to the proposed action; and to comply with the requirements of OAR-345-80-072.

III. Purpose

The purpose of this MOU is to establish an understanding among the BLM, BPA, State, and PP&L for the efficient completion of the Process. It will establish obligations to be met and procedures to be followed by the primary parties; and BPA as a cooperating party for completion of the Process. This MOU defines general and specific measures that will be undertaken by all parties for the fulfillment of mutual objectives and individual requirements. The goal of this MOU is to minimize Process completion time while maintaining the quality necessary to meet the requirements of applicable laws and regulations. Another goal is to reduce paperwork and delay by eliminating duplication.

IV. Obtaining a Contractor

A. BLM shall develop, in consultation with BPA, State, and PP&L, the evaluation criteria to be used for selecting an environmental contractor (herein referred to as Contractor). The evaluation criteria shall contain, but not be limited to, the following factors:

1. Expertise in the areas of environmental concern (water quality, biology, land use, visual resources, archaeology, socio-economics, threatened and endangered species, forestry, soils.)

2. Demonstrated ability to perform environmental analyses through experience or expertise.

3. Ability to produce thorough concise, readable, and informative documents.

4. Evidence of a good working knowledge of NEPA, Federal and State regulations and applicable local ordinances, and other statutory and administrative requirements.

5. Staff capacity to complete the EIS within 18 months of completion of the scoping process. Scoping is to be completed not later than 60 days from receipt of a site certificate application or a voluntary notice of intent to file a site certificate application with the State.

6. Demonstrated experience with completing environmental studies on transmission line projects.

B. BLM, State, BPA, and PP&L shall identify prospective EIS contractors who meet the evaluation criteria. Prospective contractors will be asked to submit technical proposals for preparation of the EIS, based upon specifications which shall be prepared by BLM in consultation with State, BPA, and PP&L.

C. BLM in consultation with the State shall evaluate the technical proposals submitted by the prospective EIS contractors with the use of BLM selection criteria. BLM shall have the sole responsibility for the final selection of the Contractor. The Contractor shall be separate, independent from, and not subcontracted by anyone preparing the engineering plans and construction designs. The Contractor shall not have any financial or economic interest in the planning, design, construction, or operation of the proposed project.

D. PP&L shall hire only the approved Contractor for the EIS preparation. The Contract shall be between PP&L and the Contractor. All costs incurred pursuant to the Contract shall be the sole responsibility of PP&L. No costs or expense borne by PP&L under the contract shall be deemed to be "administrative or other costs" subject to BLM cost reimbursement regulations under 43 CFR Subpart 2803.

E. The contract shall require that the Contractor shall execute a disclosure statement, prepared by BLM, specifying that it has no financial or other interest in the outcome of the project.

F. The contract shall provide that the Contractor shall agree to hold harmless and indemnify BLM with respect to any and all claims, demands, cause(s), of action, and liabilities which may arise from the Contractor's performance, purchases or services utilized in the preparation of the EIS.

V. General Obligations of the Primary Parties

A. Actively participate in all phases of the Process.

B. Establish a mutually acceptable time schedule for the Process.

C. Develop an acceptable time schedule for the review of significant parts of the EIS as it is being developed.

D. Attend regular and other meetings with appropriate Federal, State, regional, and local agencies, and concerned groups for the purpose of increasing communication and receiving comments on the proposed project and related environmental documents.

E. Ensure coordination of efforts and exchange of information between primary and cooperating parties.

F. In all instances involving questions as to the content or relevance of any material (including all issues, data, analyses, and conclusions) in the EIS, BLM shall make the final determination on the inclusion, deletion or revision of the material, and shall have the ultimate responsibility for assuring compliance with the requirements of NEPA.

G. PP&L recognizes the responsibility of BLM to comply with NEPA, to define the issues, to review, modify and issue the EIS. However, in executing this MOU, PP&L reserves the right to contest, in any administrative or judicial proceedings, the content and adequacy of the EIS; any decision concerning the issues in the EIS; or any other Federal or State requirement relating to the proposed project.

VI. General Obligations of Primary and Cooperating Parties

A. Actively participate in the Process by cooperating with all the parties of this memorandum.

B. Expedite the Process by consolidating meetings, mandatory processes, and documents whenever practicable.

C. Have their respective representatives attend regular meetings with the other parties to this memorandum. Attend other meetings when any particular party's attendance is necessary to provide issue clarification, expertise, or in response to a public demand.

D. Provide all general and specific information, within their respective purview, that will be needed to complete the Process.

VII. Procedures

A. The Primary parties will jointly develop a "preparation plan" in consultation with the Cooperating party. The preparation plan shall be approved by BLM prior to the preparation of the EIS. The preparation plan describes the significant issues to be addressed in the EIS and defines the organization, scheduling, and content of the EIS. The preparation plan will be used by the Contractor as an outline for EIS preparation along with CEQ Regulations, U.S. Department of the Interior Manuals, and BLM's current EIS guidelines. The approved preparation plan may be modified by BLM only in the event that there is a change in the proposal, new information surfaces, policy changes occur which affect project scope, or as a result of comment on the DEIS. BLM will inform parties in writing of all such modifications.

B. BLM and State will be responsible for conducting scoping meetings with the public, prior to the initiation of the Process. These meetings will be held to determine the areas of public and agency concern pertaining to the proposed project, and to guide the parties in scoping the EIS.

C. The Contractor shall have primary responsibility for writing or rewriting all sections, parts, or chapters of the EIS consistent with the overall time schedule developed in the preparation plan.

D. Generally, joint meetings between all primary parties shall be held to coordinate the EIS preparation. BPA will attend some of these meetings. BLM staff or PP&L may at times work directly with the Contractor without the participation of all parties, but all parties shall be informed of such meetings and given the opportunity to participate. All significant meetings or conversations will be summarized in writing for the benefit of all parties.

E. The Contractor will provide BLM and the other parties with opportunities to review, comment, and suggest changes in the PDEIS. The parties will provide comments in a timely manner. The Contractor shall incorporate these comments and changes into the sections, parts, or chapters of the PDEIS as required by BLM. Upon acceptance and approval of the PDEIS by BLM, BLM shall issue the DEIS to the public, and Federal, State, and local agencies for review and comment. Printing of the DEIS shall be the responsibility of the Contractor and BLM shall be responsible for its distribution.

F. Upon completion of the DEIS, BLM and State will be responsible for organizing and conducting any public hearings. BLM will be responsible for filing the DEIS with the Environmental Protection Agency (EPA). BLM will receive all comments on the DEIS resulting from the review and comment period. A public comment period of no less than 60 days, unless otherwise designated by appropriate authority, will be initiated when EPA publishes the "Notice of Availability" in the Federal Register.

G. After the close of the DEIS review and comment period, BLM will assess and consider comments submitted by the public, Federal, State, and local agencies and determine which will require response in the FEIS. BLM will determine any necessary modification of the text. The State will be responsible for reviewing and assessing all comments which relate to the requirements of OAR Chapter 345 Division 80, and will determine any necessary modifications of the text which relate directly to these requirements. These modifications shall be incorporated in the FEIS by the Contractor in a timely manner.

H. Upon revision of the text, which includes the responses to the comments on the DEIS, the Contractor will provide all parties an opportunity to review the FEIS. Upon acceptance and approval of the FEIS, by BLM, BLM shall authorize the release of the FEIS to the public, and federal, state, and local agencies. BLM will be responsible for filing the FEIS with the EPA. Printing of the FEIS shall be the responsibility of the Contractor and BLM shall be responsible for its distribution.

VIII. Termination

A. Any party to this MOU may terminate its interest in it after 30 days prior notice to the other parties. During the intervening 30 days the parties agree to actively attempt to resolve any outstanding disputes or disagreements.

B. If BLM concludes that the environmental documents do not meet Department of Interior and BLM EIS standards, it may terminate the agreement. In the event of termination of the agreement, BLM will initiate preparation of the EIS, based on the applicant's request, and consistent with BLM's manpower and budget limitations. The applicant will be required to submit adequate environmental information to BLM prior to preparation of the EIS.

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IX. RESERVED RIGHTS

By entering into this agreement, PP&L does not waive its objections to the BLM right-of-way processing cost regulations under which PP&L would be required to reimburse BLM for the cost of preparing the EIS in lieu of bearing such costs directly as provided herein; and PP&L reserves its right to challenge said regulations and the authority of BLM to insist that PP&L agree to bear the costs of preparing the EIS as a condition precedent to BLM's commencing review of the subject Project Application.

X. Parties Concurrence

For the Bureau of Land Management

Date: 1/30/81

Signed: Paul M. Zeitenick
(Name)

Title: Associate State Director
(State Director)

For PP&L

Date: 2/03/81

Signed: D. E. Dorman
(Name)

Title: President

OR - 209

For the Bonneville Power Administration

Date: 2/6/81

Signed: Marvin Clanger

Title: Asst. Administrator for Engineering and Construction

For the State of Oregon, Department of Energy

Date: 2/4/81

Signed: Lynn Frank

Title: Director

GLOSSARY

Alignment - The specific, surveyed location or route of a utility line.

BLM Visual Resource Management Classes - Management Classes describe the different degrees of modification allowed to the basic elements of the landscape. Class designations are derived from an overlay technique that combines separate maps of scenic quality, sensitivity levels, and distance zones. The overlays are used to identify areas with similar combinations of factors. These areas are assigned to one of five Management Classes according to predetermined criteria. The resulting map of contiguous areas sharing the same VRM class is an important document for all Bureau land use planning decisions, and it is also used to assess the visual impact of proposed development. At the most restrictive end of the class scale, Class 1 does not allow contrasts due to management activities which would attract attention; this classification is applied to wilderness areas and similar situations. Visual contrasts also must not attract attention in Class 2 areas. In Class 3 areas, contrasts can be evident but should remain subordinate to the existing landscape. Contrasts in Class 4 areas can be a dominant element but should repeat the form, line, color, and texture of the existing landscape, while the Class 5 designation is applied to landscapes which have been extensively disturbed and need rehabilitiation.

Cable - A conductor with insulation, a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable). Underground and underwater cables typically are housed in oil or compressed gas.

Circuit - A conductor or system of conductors through which an electric current is intended to flow.

Cogeneration - The simultaneous production of electricity and process heat. The most common form of cogeneration uses water as the working fluid to produce high pressure steam in a combustion boiler which is expanded through a single or multi-stage extraction or non-extraction turbine to produce electricity. Extracted and/or exhaust steam is used to supply process heat.

Conductor - A material, usually in the form of a wire, cable, or bus bar, suitable for carrying an electric current.

Cooperating Agency - A unit of federal, state or local government which is cooperating in the environmental impact statement process for a specific action. For this project, the cooperating agencies are the Bureau of Land Management (BLM) of the U.S. Department of the Interior, the Bonneville Power Administration (BPA) of the U.S. Department of Energy, and the Oregon Department of Energy (ODOE).

Cooperating Party - Any organization, public or private, which is directly connected with and cooperating in the environmental impact statement process for a specific action. For this project, the cooperating parties are the three cooperating agencies (BLM, BPA and ODOE) plus Pacific Power and Light Company.

Corona - A luminous electrical discharge which appears around transmission line conductors when the air adjacent to the conductor is ionized (electrically charged) due to the applied potential exceeding a certain critical value. Corona can be seen as bluish tufts or streamers surrounding the conductor, usually accompanied by an audible hissing sound. Transmission line corona varies with atmospheric conditions, being more intense during wet weather.

Corridor - A linear strip of land which accommodates or is expected to accommodate a utility facility or all such facilities with similar orientation passing through a given land area. Its width can be variable and is normally measured in feet.

Easement - A right that has been acquired on another's land; in this EIS the right is to construct and operate a transmission line.

EFSC - The Oregon Energy Facility Siting Council. EFSC is an independent unit of Oregon State government which is responsible for reviewing applications for the construction and operation of major energy facilities to be located within Oregon. Site Certificates, which usually contain conditions or stipulations governing construction or operating practices, are granted for approved projects after an in-depth hearing and evaluation process.

Fee Simple - Absolute ownership of land with unrestricted rights of disposition.

Gauss - A unit used in measuring magnetic induction or magnetic flux density, equal to one line of magnetic flux per square centimeter. The magnetic field of the earth is approximately one-half gauss.

Grounded - Connected to earth or to some extended conducting body which serves to maintain ground potential and dissipate current conducted to it into the earth.

Insulated - Separated from other conducting surfaces by a dielectric substance or airspace permanently offering a high resistance to the passage of current and to disruptive discharge through the substance or space, up to the dielectric's rated capacity.

kV - Kilovolt (1,000 volts).

Line Loss - The power dissipated in a transmission line expressed in watts; conductor resistance and other factors lead to power being lost in transmission between one point and another.

Load - The amount of electric energy consumed by a set of users.

Load Managment - Programs or methods used by an electric utility to shift electric energy consumption to off-peak hours and to reduce peak demand.

Load Shedding - A method whereby loads in isolated areas are dropped by automatic relays to provide protection for the bulk power system. This could occur when generation is insufficient to meet load or transmission lines are in danger of overload.

Magnetic field - A region of space in which there is an appreciable magnetic force. Near transmission lines, a magnetic field is created by the flow of current in the circuit.

Nonspecular - Nonreflective. A nonspecular surface (for example, an airblast-abraded conductor) does not shine.

Pacific Northwest - Southwest AC Intertie - A series of alternating current 500 kV transmission lines which are interconnected so as to provide a high voltage transmission link between the Pacific Northwest (Oregon, Washington, Idaho, and Montana) with the Pacific Southwest (California, Arizona, and Nevada). In general, most power is transmitted from the Northwest to the Southwest during periods of high runoff in the late spring and early summer, although power can be transmitted in either direction when conditions warrant it.

Particulate - Very small particles.

Puller - Usually a trailer-mounted rig with a donkey engine and a number of drums to pull the conductor.

Redundancy - In terms of reliability, the provision in a system of more elements and/or components than needed to perform a function even when some elements and/or components fail. In a transmission system, redundancy may simply mean the availability of more lines than necessary for operation with all system components in service.

Right-of-way - (appreviated: ROW; plural: rights-of-way) - an accurately located strip of land with defined width, point of beginning and point of ending. The area within which the user has authority to conduct the operations approved or granted by the land owner in an authorizing document such as a permit, easement, lease, license, memorandum of understanding, etc.

Riparian - Of, adjacent to, or living on the bank of a river, stream, lake or pond. In this document, riparian vegetation does not include wetland vegetation. Riparian vegetation crossed by the alternate routes consists almost entirely of riparian tree- or shrub-dominated areas bordering streams.

Span length - The horizontal distance between two adjacent supporting points of a conductor.

Tap - To tie a substation into an existing line by simply running a new single circuit from the substation to the existing line and tying into it; tapping feeds only a portion of the power carried on the line to the substation.

Third-Party Contractor - An independent firm contracted by one agency to perform work related to a proposed action of another organization; due to the financial and contractual arrangements governing such relationships, the third-party contractor has no financial or other interest in the decision to be reached on the project. Envirosphere Company, a division of Ebasco Services, Incorporated (which is a wholly owned subsidiary of the Enserch Corporation), is a third-party contractor for this EIS. Pacific Power and Light Company, the main project proponent, funds the work of Envirosphere Company although the work is performed under the control and direction of the BLM.

Vernal Pool - A surface collection of water, similar to a seep, generally occurring during the spring months.

Voltage - The effective root-mean-square (rms) potential difference between any two conductors or between a conductor and ground. Voltages are expressed in nominal values. The nominal voltage of a system or circuit is the value assigned to a system or circuit of a given voltage class for the purpose of convenient designation. The operating voltage of the system may vary above or below this value.

Wetland - Those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands crossed by the alternate routes consist of the open water, sand and gravel bar areas, banks of streams and a sedge dominated meadow adjacent to a small reservoir just south of the North Umpqua River crossing.

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