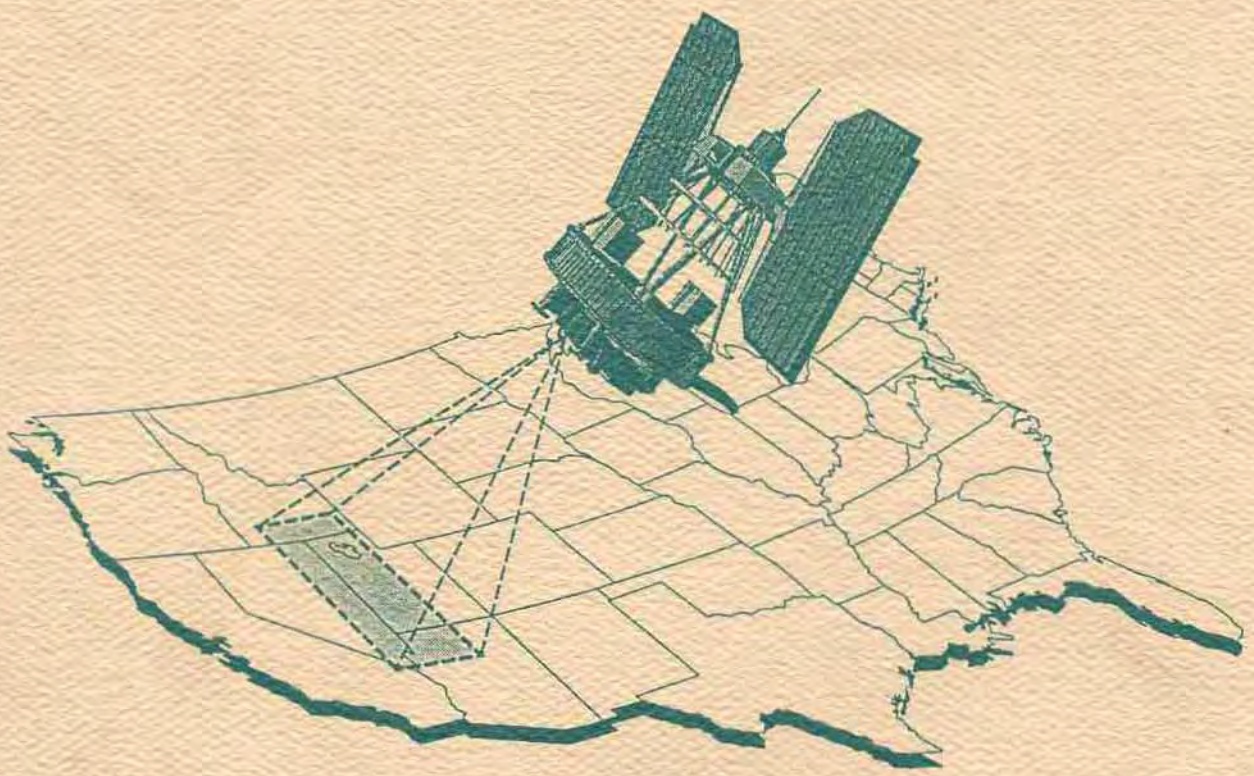
SOUTHWEST INTERTIE PROJECT

FINAL ENVIRONMENTAL IMPACT STATEMENT and PROPOSED PLAN AMENDMENT



Prepared by the:

U.S. Department of the Interior
Bureau of Land Management
Burley, Shoshone, and Boise District Offices, Idaho
Elko, Ely, and Las Vegas District Offices, Nevada
Richfield District Office, Utah

In Cooperation with:

U.S. Department of Agriculture
Forest Service
Intermountain Region, R-4

U.S. Department of Interior
National Park Service
Pacific Northwest, Rocky Mountain, and Western Regions

U.S. Department of Interior
Bureau of Indian Affairs
Cedar City, Utah

U.S. Department of Interior
Bureau of Reclamation
Pacific Northwest, Upper Colorado and Lower Colorado Regions

July 1993

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Burley District Office
Route 3, Box 1
Burley, Idaho 83318

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:

July 16, 1993

Dear Reviewer:

Enclosed is the Southwest Intertie Project (SWIP) Final Environmental Impact Statement/Proposed Plan Amendment (FEIS/PPA) on the proposed Idaho Power Company 500kV Transmission Line, the SWIP. This document is in abbreviated format and is to be used in conjunction with the SWIP Draft Environmental Impact Statement and Draft Plan Amendment (DEIS/DPA). The SWIP DEIS/DPA was distributed to the public in June 1992. Chapter 1 of the SWIP FEIS/PPA addresses the Proposed Plan, Chapter 2 reviews Public Participation, Chapter 3 contains Modifications and Additional Studies, Chapter 4 lists errata and corrections to the SWIP DEIS/DPA, and Chapter 5 contains public comments and responses. The SWIP FEIS/PPA has been prepared considering comments received on the SWIP DEIS/DPA.

Please note that there are two minor changes to the Agency Preferred Route made in this document in response to public comments on the SWIP DEIS/DPA. The first was made to mitigate potential visual and land use impacts to future land developments in the vicinity of Oasis, Nevada (refer to page 3-36 of this document). The Agency Preferred Alternative in the Oasis area was changed to Links 221 and 223 (refer to Figure 1-1 in Chapter 1 of this document). This routing would also better utilize a BLM designated utility corridor. The second change was made in the Sacramento Pass area to mitigate potential visual impacts to travelers to Great Basin National Park and avoid crossing private lands near Baker, Nevada (refer to page 3-39 of this document). The Agency Preferred Alternative in the Baker area was changed to Links 464, 466, 468, 471, and 473 (refer to Figure 1-1 in Chapter 1 of this document).

This document addresses Idaho Power Company's proposed right-of-way application to construct an approximately 520-mile 500kV transmission line from Midpoint Substation near Shoshone, Idaho to a proposed substation northeast of Las Vegas, Nevada, referred to as the Dry Lake Substation site. This segment of the SWIP is referred to as the Midpoint to Dry Lake segment. It also addresses the proposed right-of-way to construct an approximately 160-mile 500kV transmission line from a proposed substation in the Ely, Nevada area to a substation near Delta, Utah. This segment of the SWIP is referred to as the Ely to Delta segment. The proposed right-of-way would also include a series compensation station near Wells, Nevada, a series compensation station in the Delamar Valley in southeastern Nevada, and 13 new microwave communication facilities on the Midpoint to Dry Lake segment.

This document contains the Bureau of Land Management's (BLM) proposal to select a preferred alternative for the Midpoint to Dry Lake segment and an alternative for the Ely to Delta segment. The Agency Preferred Alternative for the Midpoint to Dry Lake segment is a combination of Routes A and G which would cross approximately 406 miles of the BLM lands, 0.5 miles of lands administered by the Bureau of Reclamation, 83.1 miles of private lands, and 5.2 miles of state lands. The Agency Preferred Alternative for the Ely to Delta segment is the 230kV Corridor Route which

would cross 197.4 miles of the BLM lands and 9.0 miles of lands administered by the Humboldt National Forest.

The National Park Service does not agree with the Agency Preferred Alternative for the Ely to Delta segment because of visual impacts to Great Basin National Park and to visitors driving to the park. None of the alternatives cross National Park Service lands, and the 230kV Corridor Route is approximately two miles from the northern boundary of the park and approximately six miles from Wheeler Peak. The 230kV Corridor Route was also moved another mile north (i.e., away from the park) in the Sacramento Pass area as referred to above.

The Agency Preferred Alternative is to allow equipment additions to the Midpoint Substation, one proposed substation near Ely, Nevada, a proposed substation in the Dry Lake Valley in southern Nevada, and a proposed substation near Delta, Utah. The specific substation site in the Dry Lake area will depend on the routing decision for the Marketplace-Allen Transmission Project (MAT) proposed by the Nevada Power Company (refer to page 2-52 of the SWIP DEIS/DPA). Series compensation stations would also be needed about halfway between the two northern substation sites northeast of Wells, Nevada and in the Delamar Valley in southern Nevada to increase the electrical performance of the transmission system. The series compensation station near Wells, Nevada may be expanded in the future to accommodate switching equipment (i.e., substation).

The Agency Preferred Alternative also proposes to construct microwave communication facilities sites at Hansen Butte, Cottonwood (in Idaho), and Ellen D, Six Mile, Rocky Point, Spruce Mountain, Long Valley, Copper, Cave Mountain, Mount Wilson, Highland Peak, Beaver Dam Mountain, and Glendale (in Nevada).

The decision to implement the selected alternative will be made on National Forest lands by the Regional Forester, by the Bureau of Reclamation on Bureau of Reclamation lands, and on the BLM land by the Idaho, Nevada, and Utah State Directors. This preferred alternative was selected by the BLM, Forest Service, and Bureau of Reclamation as a result of public comments and concerns on the SWIP DEIS/DPA released July 1992.

The SWIP decision document would serve as a plan amendment to Resource Management Plans (RMP) and Management Framework Plans (MFP) where the Agency Preferred Alternative would be outside a designated utility corridor in three of the BLM Districts crossed (refer to Figure 1-2 in Chapter 1 of this document). The Humboldt National Forest Land and Resource Management Plan and Great Basin National Park General Management Plan would not be amended. The Bureau of Reclamation does not have a land use plan to be amended. The BLM RMPs and MFPs, now in effect, that may be amended are as follows:

Utah

- House Range Management Plan (Richfield District) - no plan amendment proposed
- Warm Springs Management Plan (Fillmore District) - no plan amendment proposed

Idaho

- Twin Falls Management Framework Plan (Burley District) - no plan amendment proposed
- Monument Resource Management Plan (Shoshone District) - no plan amendment proposed

Nevada

- Wells Resource Management Plan (Elko District) - plan amendment proposed
- Schell Management Framework Plan (Ely District) - plan amendment proposed
- Egan Resource Management Plan (Ely District) - plan amendment proposed
- Caliente Management Framework Plan (Las Vegas District) - plan amendment proposed
- Stateline Management Framework Plan (Las Vegas District) - plan amendment proposed

The portion of the proposed plan amendment affecting the BLM administered lands may be protested in accordance with 43 CFR 1610.5-2. Protests must be postmarked no later than August 17th, 1993. The protests must be in writing, and sent to:

Director, BLM (760)
Department of Interior
1848 C Street NW
Washington, DC 20240

Protests must contain: (1) name, mailing address, telephone number and interest of the person filing the protest, (2) a statement of the issue(s) being protested, (3) a statement of the part(s) of the plan being protested, (4) a copy of all documents addressing the issue(s) that were submitted during the planning process by the protesting party, or an indication of the date the issue or issues were discussed for the record, (5) a concise statement explaining why the proposed plan is believed to be wrong.

At the end of the protest period, the BLM portion of the proposed plan, excluding any portion under protest, shall become final. Approval shall be withheld on any portion of the plan until final action has been completed on such protest. The BLM approval process and the final plan for the BLM is expected to be published with the Record of Decision in the late summer or fall 1993.

The Bureau of Reclamation will issue a separate decision document. The 30 day review period ends August 17th 1993. Written comments may be submitted to:

John Keys, Regional Director
Bureau of Reclamation, Pacific Northwest Regional Office
1150 N. Curtis Road
Boise, ID 83706

The Forest Service decision on the National Forest portion of the proposed plan is subject to administrative review (appeal) in accordance with the provisions of the Forest Service Appeal Regulations set forth in 36 CFR 217. Any appeal of the Forest Service decision must include the information required by 36 CFR 217.9 (content of a notice of appeal), including the reasons for the appeal. Two (2) copies of the Notice of Appeal must be made in writing and submitted within 45 days of the date of publication of the decision to the Regional Forester:

Gray F. Reynolds, Regional Forester
Intermountain Region (R-4), USDA Forest Service
Federal Building, 324 25th Street
Ogden, Utah 84401

A BLM protest, or Forest Service or Bureau of Reclamation appeal must be filed separately if the reviewer wishes to direct concerns on lands administered by the BLM, Forest Service, or Bureau of Reclamation. Those people not wishing to protest or appeal but wishing to comment may send comments to Bureau of Land Management, Burley District Office at the address below. All comments received will be considered in the preparation of the BLM Record of Decision.

A copy of the SWIP FEIS/PPA will be sent to all persons, organizations, or agencies who received the SWIP DEIS/DPA, or to anyone requesting a copy. Please address requests for copies of the SWIP FEIS/PPA to:

Karl Simonson
Bureau of Land Management
Burley District Office
Route 3, Box 1
Burley, Idaho 83318

Sincerely,

Gerald L. Quinn

Gerald L. Quinn
District Manager

COVER SHEET
Southwest Intertie Project
Final Environmental Impact Statement/Proposed Plan Amendment

( ) Draft
(**X**) Final

(**X**) Administrative
( ) Legislative

Lead Agency

U.S. Department of Interior
Bureau of Land Management

Cooperating Agencies

U.S. Department of Agriculture
Forest Service

U.S. Department of Interior
Bureau of Reclamation

U.S. Department of Interior
National Park Service

U.S. Department of Interior
Bureau of Indian Affairs

EIS/PA Contact

Comments on this FEIS/PPA should be directed to:
Karl Simonson
Bureau of Land Management
Burley District Office
Route 3, Box 1
Burley, Idaho 83318

Copies of the FEIS/PPA have been sent to and comments requested from:
Refer to Appendix B

Date FEIS/PPA Mailed to the Public:
July 6, 1993

Date by Which Comments, Protests Must Be Received or Postmarked By:
August 17, 1993

Abstract

The Southwest Intertie Project (SWIP) is a proposed 500kV electrical transmission line system between the Midpoint Substation near Shoshone, Idaho and a proposed substation in Dry Lake Valley, northeast of Las Vegas, Nevada (referred to as the *Midpoint to Dry Lake segment*), and between a proposed substation in the Ely, Nevada area and a proposed substation near Delta, Utah (referred to as the *Ely to Delta segment*). Idaho Power Company proposes to construct, operate, and maintain a 500kV transmission line on the requested right-of-way grant for the Midpoint to Dry Lake segment and requests that the Bureau of Land Management (BLM) assign the right-of-way for the Ely to Delta segment to the Los Angeles Department of Water and Power (LADWP). The LADWP proposes to construct, operate, and maintain a 500kV transmission line on the Ely to Delta segment on behalf of the participants of the Utah-Nevada Transmission Project (UNTP).

Equipment additions are proposed to the existing Midpoint Substation near Shoshone, Idaho. New substations are proposed near Ely and Las Vegas in Nevada, and near Delta in Utah. Series compensation stations are proposed midway between Midpoint Substation in Idaho and the proposed substation near Ely, Nevada, and in the Delamar Valley between the Ely area and the Dry Lake Valley. New microwave communication facilities are also proposed on the Midpoint to Dry Lake segment.

The Midpoint to Dry Lake segment of the SWIP would increase the ability to conduct northwest-southwest power exchanges, would increase the capacity and reliability of the interconnected electrical grid in the western U.S., and would enhance competition and economic efficiency of the regional power market. This segment of the SWIP would establish an "open marketplace" for power transfers in the Las Vegas area. Because of the increased capacity to share regional resources, an additional benefit would be deferring new generation facilities and diversifying fuel resources. The Ely to Delta segment of the SWIP would increase the reliability between the existing transmission systems in the Delta area and the planned north-south SWIP system and create a bi-directional transfer path between the Pacific Northwest and intermountain regions and between the intermountain region and southern Nevada.

Alternatives considered for the SWIP include the No-Action, energy conservation, alternative generating sources, alternative transmission systems, alternative transmission technologies, and the proposed action which includes nine routing alternatives on the Midpoint to Dry Lake segment, plus the agency and utility preferred routes, which have slight variations, and four (4) routing alternatives on the Ely to Delta segment:

Midpoint to Dry Lake Segment Routing Alternatives

- Route A - 345kV*-Thousand Springs-Goshute Valley-Steptoe-Egan Range-Dry Lake Route
- Route B - 345kV*-Trout Creek-Wendover-Steptoe-Antone Pass-Dry Lake Route
- Route C - 345kV*-Trout Creek-Goshute Valley-Steptoe-Egan Range-Dry Lake Route
- Route D - 345kV*-Wells-Steptoe-Egan Range-Dry Lake Route
- Route E - 345kV*-Thousand Springs-Wendover-Steptoe-Egan Range-Dry Lake Route
- Route F - Hagerman-Trout Creek-Goshute Valley-Egan Range-Dry Lake Route
- Route G - 345kV*-Cottonwood Creek-Thousand Springs-Goshute Valley-Steptoe-Egan Range-Dry Lake Route
- Utility Preferred Route
- Agency Preferred Route

(* - 345kV refers to the routing alternative being parallel to the Midpoint to Valmy 345kV transmission line)

Ely to Delta Segment Routing Alternatives

- Direct Route
- Cutoff Route
- 230kV Corridor Route (Agency and Utility Preferred)
- Southern Route

This SWIP Final Environmental Impact Statement/Proposed Plan Amendment (FEIS/PPA) assesses the environmental consequences of the federal approval for the project. Impacts of the proposed action would result from the access roads, tower sites, and staging areas required to construct the transmission line and related facilities. Impacts are expected to soils, vegetation, wildlife, cultural resources, scenic resources, and land uses. Electric and magnetic field effects have also been studied for this project.

Because this document is in an abbreviated format, please refer to the SWIP Draft Environmental Impact Statement/Draft Plan Amendment (DEIS/DPA) as a reference for this SWIP FEIS/PPA.

Corrections to the SWIP DEIS/DPA are made in Chapter 4 of this document. Additional studies are found in Chapter 3.

The Agency Preferred Alternative for the Midpoint to Dry Lake segment is identified in this document as a combination of Route A and G (as described in the SWIP DEIS/DPA). The Agency Preferred Alternative for the Ely to Delta segment is the 230kV Corridor Route (as described in the SWIP DEIS/DPA).

The Agency Preferred Alternative is to allow equipment additions to the Midpoint Substation, one proposed substation near Ely, Nevada, a proposed substation in the Dry Lake Valley in southern Nevada, and a proposed substation near Delta, Utah. The specific substation site in the Dry Lake area will depend on the routing decision for the Marketplace-Allen Transmission Project (MAT) proposed by the Nevada Power Company (refer to page 2-52 of the SWIP DEIS/DPA). Series compensation stations would also be needed about halfway between the two northern substation sites northeast of Wells, Nevada and in the Delamar Valley in southern Nevada to increase the electrical performance of the transmission system. The series compensation station near Wells, Nevada may be expanded in the future to accommodate switching equipment (i.e., substation).

The Agency Preferred Alternative would also construct microwave communication facilities at Hansen Butte, Cottonwood (in Idaho), and Ellen D, Six Mile, Rocky Point, Spruce Mountain, Long Valley, Copper, Cave Mountain, Mount Wilson, Highland Peak, Beaver Dam Mountain, and Glendale (in Nevada).

Idaho State Director
Bureau of Land Management

Date

SUMMARY

SUMMARY

Southwest Intertie Project

The Southwest Intertie Project (SWIP) is a proposed inter-regional transmission system consisting of two single-circuit 500 kilovolt (kV) alternating current (AC) transmission line segments (nearly 700 miles in total length), associated proposed substation facilities, intermediate series compensation stations, and microwave communication facilities. The transmission line segments are referred to as the Midpoint to Dry Lake segment and the Ely to Delta segment. The Ely to Delta segment was also referred to as the Crosstie in the SWIP Draft Environmental Impact Statement/Draft Plan Amendment (DEIS/DPA).

The Idaho Power Company (IPCo) proposes to construct, operate, and maintain the approximately 520 mile Midpoint to Dry Lake segment from the existing Midpoint Substation near Shoshone, Idaho interconnecting to a proposed substation in the Ely, Nevada area, and continuing south to a proposed substation site in the Dry Lake Valley northeast of Las Vegas, Nevada. The estimated capacity rating of this segment is 1200 Megawatts (MW). From the Ely, Nevada area the nearly 160 mile Ely to Delta segment is proposed to connect from a proposed substation in the Ely area east to a proposed substation near Delta, Utah. The estimated capacity rating of this segment is 1100 MW.

In 1988 the IPCo applied for a right-of-way grant to construct and operate a transmission interconnection from their 500kV Midpoint Substation near Shoshone, Idaho to a proposed substation site in the Delta, Utah area. In the Delta area, the IPCo was proposing to interconnect with and obtain transmission capacity on the Utah-Nevada Transmission Project (UNTP), a proposed 500kV transmission line from Delta to a proposed substation site located approximately 13 miles southwest of Boulder City, Nevada. The UNTP proposal also included the line segment between Ely and Delta, which was proposed to be developed as a second Phase. The UNTP participants include utilities in Utah, Nevada, and California.

In early 1990, the IPCo determined that the UNTP would be fully subscribed and would not be able to provide the transmission capacity for the SWIP to the proposed substation near Boulder City, Nevada. The IPCo decided that the SWIP would have to be extended south from the Ely area in order to meet the purpose and need for the SWIP project to interconnect in the Las Vegas area. In June 1990 the SWIP studies were expanded to include routes from the Ely, Nevada area to a proposed substation site northeast of Las Vegas in the Dry Lake Valley.

The SWIP Ely to Delta segment was originally a joint SWIP and UNTP Phase II transmission line segment. When the SWIP right-of-way application to the Bureau of Land Management (BLM) was amended in June 1990, the IPCo's need for the Ely to Delta segment changed. However, the Ely to Delta segment remains an important part of the UNTP and the need for it remains unchanged.

The lead federal agency for the SWIP, the BLM, recommended that this transmission segment be retained in the SWIP EIS/PA process. This nearly 160-mile transmission line segment would extend east from the vicinity of Ely, Nevada to near Delta, Utah. The right-of-way for this segment would be granted to the IPCo, who would request that the BLM assign it to the Los Angeles Department of Water and Power (LADWP). The LADWP would, on behalf of the UNTP participants,

construct, operate, and maintain this portion of the line and the proposed substation near the Intermountain Generating Station near Delta, Utah.

The SWIP Midpoint to Dry Lake segment would be constructed using the following tower types:

- V-guyed (or other guyed) steel lattice or self-supporting steel lattice
- steel pole H-frame in agricultural areas
- self-supporting steel lattice at specific intervals for lateral support

The towers for the Midpoint to Dry Lake segment could range from 90-160 feet in height, but would average 120-130 feet. This segment of the project would require a proposed substation near Ely, Nevada, a proposed substation in Dry Lake Valley in southern Nevada, and equipment additions to the existing Midpoint Substation. Series compensation stations would also be needed about halfway between the two northern substation sites northeast of Wells, Nevada, and in the Delamar Valley in southern Nevada to increase the electrical performance of the transmission system. The series compensation station near Wells, Nevada may be expanded in the future to accommodate switching equipment (i.e., substation). A proposed microwave communication system to operate the system would also be required between Midpoint Substation and the proposed substation at Dry Lake. In addition, a fiber optic ground wire may be installed instead of conventional ground wires to serve the needs of commercial communications companies. If installed, access to the fiber optic system would only be allowed upon completion of all environmental permitting activities (e.g., the National Environmental Policy Act) and right-of-way acquisition.

The towers for the Ely to Delta segment could range from 90-160 feet in height, but would average 120-130 feet. The Ely to Delta segment would require a new substation near Delta, Utah. Tower types between Ely to Delta would be constructed using:

- self-supporting steel lattice structures
- steel pole H-Frame for visual mitigation and agricultural areas

An existing microwave communication system between Ely, Nevada, and Delta, Utah would be used with only minor upgrades.

The Agency Preferred Alternative is to grant the IPCo a 200-foot right-of-way across approximately 700 miles of lands administered by the BLM, the Forest Service (FS), and the Bureau of Reclamation. Idaho Power would obtain easements for the portion of the route crossing private lands. This route is a combination of Routes A and G, for the Midpoint to Dry Lake segment of the SWIP and the 230kV Corridor Route for the Ely to Delta segment of the SWIP (refer to Figure 1-1 for a map of the Proposed Plan and to the Alternative Routes map in the Map Volume accompanying the SWIP DEIS/DPA). The Agency Preferred Alternative also includes five proposed substation or series compensation sites and the 13 sites for microwave communication facilities. The Proposed Plan Amendment is to designate a utility corridor along the Agency Preferred Alternative to accommodate the SWIP 500kV transmission line where this route deviates from agency designated and planning corridors.

Purpose and Need

Electrical utilities have a responsibility to provide adequate supplies of reliable and economical electricity to all classes of customers. State and federal regulatory agencies review the proposed actions of utilities to assure electrical customers the lowest possible costs. Utilities focus on least cost planning, which considers conservation equally with new generation options, to provide reliable electrical service at the lowest reasonable infrastructure cost.

The purpose of the SWIP is to meet the goals of least cost planning, to increase transmission capacity and reliability, and to allow for the sharing of the electrical supplies between the regions of the West. The increase in transmission capacity and reliability would benefit electrical consumers by keeping their costs as low as possible in a future electrical market with high demands for conservation, environmental awareness, and cost consciousness.

The need for increased power exchanges in the western United States is particularly evident between the Northwest and the Southwest. Two main avenues of transmission now being used are the Pacific Interties in the West and various smaller lines around the east side of the Great Salt Lake. These major paths are presently unable to accommodate the full need for electric power transfers between the northern and southern portions of the western transmission system. Electrical demand and consumption in the Desert Southwest are greatest in the summer, as opposed to the Pacific Northwest, where they are greatest in the winter. This seasonal diversity between these western regions has been identified to be approximately 3000 MW. This seasonal diversity can be captured by increasing the transmission capacity between the regions of the West.

The proposed addition of the SWIP to the regional power grid is being considered to allow the Northwest, the Southwest, and the Intermountain regions of the country to take advantage of the various load pattern diversities, including variations in electrical demand and supply within the region. It would create an additional bi-directional transfer path between the Pacific Northwest and the Intermountain regions of the West. Currently, these areas are interconnected only by lower voltage transmission lines with limited electric load-carrying capability. It would also create an additional bi-directional transfer path between the Intermountain area and the Southwest including southern Nevada, an area that is rapidly growing and is in need of additional energy and capacity resources to serve its native load.

The proposed addition of the SWIP would provide regional economic benefits by capturing current and future efficiencies within the electric power system of the western United States. It would enable the regions' utilities to realize these efficiencies by interconnecting the systems of the Northwest and Southwest with firm transmission access via the SWIP's proposed "open marketplace" concept. Open access across the SWIP would facilitate creative energy transactions which, driven by the forces of the open market, would take economic advantage of the load and resource diversities between the regions. Transactions on the SWIP would allow interconnected utilities to better use existing internal transmission capacity. These transactions would benefit the wheeling utility by creating revenues that can be applied against its internal system costs, including seasonal exchanges, resource coordination, nonfirm sales and purchases, firm sales and purchases, and reserve sharing. The SWIP would also provide other benefits including improved system reliability and environmental enhancements.

The SWIP would allow utilities in the Northwest and the Southwest to add capacity and reliability to the western electrical system at an economical price. Specifically, the SWIP would fulfill the major needs as outlined below:

Seasonal Exchanges

Seasonal exchanges provide benefits by taking advantage of the load pattern diversities between regions. By directly interconnecting and exchanging power between the winter peaking Northwest and the summer peaking Southwest, both regions would benefit from increased operating efficiencies of existing resources. Seasonal exchange transactions could reduce operating expenses through fuel diversity, as well as reduce capital cost expenditures by deferring costly new generating resources.

The SWIP would allow the Northwest, the Southwest, and the Intermountain areas to take advantage of the various load pattern diversities including variations in electrical demand and supply within the region. The Ely to Delta segment would create an additional bi-directional transfer path between the Northwest and the Intermountain regions of the West. Currently, these areas are interconnected only by lower voltage transmission lines with limited electric load-carrying capability. It would also create an additional bi-directional transfer path between the Intermountain area and the Southwest including southern Nevada. This is an area that is rapidly growing and is in need of additional energy and capacity resources to serve its native load.

Resource Coordination

The SWIP would enable regional resources with diverse generating characteristics to operate jointly in a manner that increases overall operating efficiencies. For example, the Northwest could use the surplus peaking capacity and storage capability of its hydro system in conjunction with the base loaded thermal resources of the Southwest, thus increasing load-carrying capability as well as reducing production costs. Resource coordination agreements, like seasonal exchanges, benefit the utilities by both reducing operating expenses and potentially deferring new generating resources.

Nonfirm Sales and Purchases

Nonfirm sales and purchases provide benefits by lowering the total power production expenses of the parties involved. Nonfirm or economy transactions accomplish this by taking advantage of the diversity in incremental production costs between generating resources, such as displacing oil resources with coal resources or displacing coal with hydro. The purchasing party benefits from lower production expenses than it would have otherwise incurred, while the selling party benefits from the revenues received that are in excess of its incremental production costs. Nonfirm transactions are generally short-term in nature, ranging from the next hour to several months, since incremental costs are very sensitive to the uncertainty of future load requirements, generating unit availability, and fuel costs or availability, such as spot gas prices or winter snow pack.

Firm Sales and Purchases

Firm agreements tend to be longer in term and place a higher level of obligation on both parties. As such, they are included in the utility's long-term planning process. The economic benefits derived from firm sales and purchases are therefore somewhat broader than those of the nonfirm market. Firm transactions benefit the purchaser by deferring large capital outlays associated with the acquisition of a new generating resource. They benefit the seller by sharing the output and the fixed costs of an existing resource until such time as the seller can fully utilize the resource.

Reserve Sharing

Reserve margin is generating capacity that must be available to respond to emergency conditions. Additional transmission capacity between the Northwest and Southwest would enhance the utilities' abilities to meet these reserve margin requirements by using the load and resource diversities that exist between regions. Thus, reserve sharing would benefit the utilities by optimizing the existing and future regional resources in meeting reserve margins.

Refer to Chapter 3 of this document for an expanded Purpose and Need statement and to the Purpose and Need in Chapter 1 of the SWIP DEIS/DPA.

Scoping and Project-Related Studies

Scoping Process

As required by the National Environmental Policy Act (NEPA) of 1969, the BLM, the FS, the Bureau of Reclamation, the Bureau of Indian Affairs, and the National Park Service completed numerous scoping activities. Scoping is an information-gathering process open to the public early in a project, to identify the range or scope of issues to address, in the ensuing environmental studies. Scoping served to identify significant issues to be analyzed, determine the scope with which they were to be treated in the DEIS/DPA, and eliminate issues and alternatives from detailed study where appropriate. Information from the agencies and the public received during scoping provided the basis for identifying alternative routes and developing the work plan for environmental baseline, impact assessment, and mitigation planning for the project.

Scoping activities included:

- reviewing previous studies of transmission projects in the area
- completing a regional siting study, including resource sensitivity analyses, agency contacts, and public scoping meetings
- identifying project issues
- identifying alternative transmission line routes

A Notice of Intent to prepare a DEIS/DPA for a transmission line project between Midpoint Substation, Ely, Nevada, and Delta, Utah, was published in the Federal Register on March 3, 1989 (Vol. 54, No. 41). Public scoping meetings were held during March 1989 in the following locations:

- Twin Falls, Idaho
- Wells, Nevada
- Ely, Nevada
- Delta, Utah

In April 1990, the project was expanded to include a route from the Ely, Nevada area to the Dry Lake Valley area in southern Nevada. A Notice of Intent to expand the scope of the SWIP DEIS/DPA and to tier from the White Pine Power Project EIS was published in the Federal Register on June 4, 1990. Three additional public scoping meetings were held in Las Vegas, Ely, and Caliente, Nevada during June 1990. A public information meeting was held in Moapa, Nevada during December 1990 to discuss the ongoing studies in southern Nevada.

Corridor Studies

Alternative transmission line routes were identified based on previous studies, the regional siting study, and public and agency input. Subsequently the environment was inventoried and the data were compiled along all final alternative routes. This baseline was then used in assessing project-related impacts.

Six public workshops were held in January and April 1991 in the same locations as the scoping meetings to report the results of the environmental studies, present the preliminary alternatives, and gain public input regarding the acceptability of those alternatives.

Alternatives Including The Agency Preferred Alternative

Six general alternatives were evaluated by the IPCo to meet its system needs:

- energy conservation and load management
- new generation sources
- alternative transmission systems
- alternative transmission technologies
- proposed action
- no action

The first four of these alternatives were eliminated from further consideration because they did not meet the system requirements or the stated purpose and need (refer to Chapter 2 of the DEIS/DPA).

The IPCo has developed and implemented numerous energy conservation and load management programs. Conservation, although effective in reducing energy use, cannot be considered an alternative action that would meet the stated need for the project.

The IPCo evaluated many alternative generation sources, including hydroelectric, thermal, solar, wind, cogeneration, solid waste, combustion turbine, fluidized bed, and nuclear fusion. Because these alternatives would not meet the goal of deferring new generation, providing for seasonal exchanges, diversifying fuel resources, and the other stated purposes of the project, this action was eliminated as an alternative.

The IPCo evaluated the feasibility of increasing power purchases from other utilities and wheeling power over the existing transmission system. This alternative is not considered viable because the present system is operated at capacity.

Alternative transmission technologies (e.g., voltages other than the proposed 500kV, direct current [DC] instead of alternating current [AC], underground construction, microwave, laser, super conductors, etc.) were evaluated. However, these technologies were not considered to be viable alternatives due to their substantially higher costs, increased environmental impacts, and/or technological infeasibility.

Advantages of the No-Action alternative would include preclusion of environmental impacts within the project study area and elimination of financial costs associated with construction and operation of a 500kV transmission line. The disadvantages would include environmental, socioeconomic, and electrical service impacts that would result due to other mitigating actions taken to ensure adequate and affordable energy supplies within the western electrical system.

Agency Preferred Alternative

The Agency Preferred Alternative is to allow the IPCo to construct, operate, and maintain a single-circuit, overhead 500kV transmission line between the existing Midpoint Substation near Shoshone, Idaho and a proposed substation site in the Dry Lake Valley northeast of Las Vegas, Nevada. A second transmission line segment, the Ely to Delta segment, would also connect about midway along the Midpoint to Dry Lake segment, near Ely, Nevada east to a proposed substation near Delta, Utah. Tower types on the Midpoint to Dry Lake segment would be constructed using V-guyed and self-supporting steel lattice structures, and steel pole H-Frame towers in agricultural areas. Tower types on the Ely to Delta segment would be constructed using self-supporting steel lattice structures and steel pole H-Frame for visual mitigation and in agricultural areas. The average span between towers would be approximately 1500 feet.

The Agency Preferred Alternative is to allow equipment additions to the Midpoint Substation, one proposed substation near Ely, Nevada, a proposed substation in the Dry Lake Valley in southern Nevada, and a proposed substation near Delta, Utah. Series compensation stations would also be needed about halfway between the two northern substation sites northeast of Wells, Nevada and in the Delamar Valley in southern Nevada to increase the electrical performance of the transmission system. The series compensation station near Wells, Nevada may be expanded in the future to accommodate switching equipment (i.e., substation).

A new microwave communication system to operate the system would also be required on the Midpoint to Dry Lake segment. Of the 13 microwave communication sites only two are currently undeveloped. These undeveloped sites would be developed without constructing new roads or power facilities. Helicopters would be used to construct and maintain them. Solar panels would

power the five sites with no existing power facilities. The following microwave communication sites are identified on Figure 1-1:

- Hansen Butte — developed site, power supply exists
- Cottonwood — undeveloped site, install solar power system
- Ellen D — developed site, install solar power system
- Six Mile — 1/2 mile from developed site, install solar power system
- Rocky Point — developed site, power supply exists
- Spruce Mountain — developed site, install solar power system
- Long Valley — undeveloped site, install solar power system
- Copper — developed site, power supply exists
- Cave Mountain — developed site, power supply exists
- Mount Wilson — developed site, power supply exists
- Highland Peak — developed site, power supply exists
- Beaver Dam Mountain — developed site, power supply exists
- Glendale — developed site, power supply exists

An existing microwave communication system would be used on the transmission line system between Ely, Nevada, and Delta, Utah.

The Midpoint to Dry Lake segment is scheduled to begin construction in 1995 and placed into commercial operation by late 1997. The Ely to Delta segment is scheduled to begin construction in 1996 and placed into operation by late 1998.

The proposed substation in the Dry Lake area would be the southern terminus of the SWIP. In 1990 the BLM asked the IPCo to help coordinate the transmission needs of utility companies with new transmission facilities planned in southern Nevada, particularly those needing transmission access to the McCullough Substation area located south of Boulder City, Nevada. The regional utilities developed a corridor concept which would maximize the capacity of the corridor while minimizing environmental impacts. Subsequent discussions with the Nevada Power Company (NPC) and other utilities resulted in the Marketplace-Allen Transmission Project (MAT), which is planned to be proposed to the Nevada Public Utility Commission in July 1993 by NPC. This approximately 53 mile project would connect the proposed SWIP substation in the Dry Lake area to a proposed marketplace substation in the McCullough Substation area. Two high capacity 500kV transmission lines would connect the two substations of the "open marketplace". The combined capacity of over 3000 megawatts would allow utilities to interconnect at either substation and conduct transactions.

Although the MAT would be operated by NPC, several other regional utilities would likely be participants in the project. The MAT would provide a major electrical transmission path through the constricted Las Vegas area. This project would also provide capacity for NPC's internal system needs. The combined capacity rating of over 3000 MW would be possible because of the relatively short distance between the two proposed marketplace substations. The high capacity of this system would allow the planned transmission lines to connect on either end, while minimizing the number of lines through this sensitive area. The MAT is proposed to be in service in 1997.

Routing Alternatives

Final routing alternatives for the proposed line were determined through a process of documentation and elimination of alternatives with serious constraints. Alternative routes were eliminated for a number of reasons, including environmental conflicts, public and agency opposition, and system planning/performance criteria.

For routing options remaining, detailed environmental studies were conducted to form the basis for comparing those alternatives. Approximately 2000 miles of alternatives routes were studied in detail. To select routing preferences, the environmental consequences of each route were summarized based on impact assessment results, environmental resource preferences, and agency and public comments. A network of routes was organized into two major routing alternatives:

- the north-south system from Midpoint Substation south to the Dry Lake Valley (the Midpoint to Dry Lake segment)
- the east-west system from Ely, Nevada to Delta, Utah (the Ely to Delta segment)

Each of these contained several routing options. The final routing alternatives are as follows:

Midpoint to Dry Lake Segment

- **Route A** - 345kV*-Thousand Springs-Goshute Valley-Steptoe-Egan Range-Dry Lake Alternative
- **Route B** - 345kV*-Trout Creek-Wendover-Steptoe-Antone Pass-Dry Lake Alternative
- **Route C** - 345kV*-Trout Creek-Goshute Valley-Steptoe-Egan Range-Dry Lake Alternative
- **Route D** - 345kV*-Wells-Steptoe-Egan Range-Dry Lake Alternative
- **Route E** - 345kV*-Thousand Springs-Wendover-Steptoe-Egan Range-Dry Lake Alternative
- **Route F** - Hagerman-Trout Creek-Goshute Valley-Egan Range-Dry Lake Alternative
- **Route G** - 345kV*-Cottonwood Creek-Thousand Springs-Goshute Valley-Steptoe-Egan Range-Dry Lake Alternative
- **Utility - Preferred Alternative** 345kV*-Cottonwood Creek-Thousand Springs-Goshute Valley-Steptoe-Egan Range-Dry Lake Alternative
- **Agency - Preferred Alternative** 345kV*-Cottonwood Creek-Thousand Springs-Goshute Valley-Steptoe-Egan Range-Dry Lake Alternative

(* - 345kV refers to the SWIP alternative being parallel to the Midpoint to Valmy 345kV transmission line)

Ely to Delta Segment

- **Delta Direct Route**
- **Cutoff Route**
- **230kV Corridor Route (Agency Preferred Alternative and Utility Preferred alternative)**
- **Southern Route**

Affected Environment

The climate of eastern Nevada, southern Idaho, and western Utah is influenced largely by location, regional weather systems, and topographic orientation. The climate throughout much of this area is characterized by hot, dry summers followed by cold, dry winters. Surface winds are channeled through valleys between generally north-south trending mountain ranges. Winds flow predominately in northeasterly or southwesterly directions. Annual precipitation depends largely on elevation. Precipitation occurs primarily in the form of snow at higher elevations during the winter months. The snows maintain high water tables and provide groundwater recharge. Some additional precipitation occurs from thunderstorms produced by daytime heating of air masses in valleys.

Northern segments of the SWIP, within southern Idaho and northeastern Nevada, are in the Snake River Plain section of the Columbia Plateau physiographic province. This section is a vast, relatively flat plain and young lava plateau, which is deeply dissected by the canyons of the Snake River and Salmon Falls Creek, the dominant landscape features within this area. Irrigated agricultural lands, this area's main land use, are found clustered north and south along the Snake River.

To the south, on the Snake River Plain, agricultural areas extend to bordering foothills and mountains in a transitional landscape between the Basin and Range and Columbia Plateau province. This transitional landscape includes foothills, plateaus, mesas, and buttes formed of eroded lava and sedimentary rock layers.

The majority of northeastern and southern Nevada and western Utah, falls within the Basin and Range physiographic provinces. Topographically, this landscape is distinguished by isolated, roughly parallel mountain ranges separated by closed (undrained) desert basins or playas. The mountain ranges often run 50 to 75 miles in length and are generally north-south trending. Surrounding the base of the mountains and extending into the basins, there are often distinctive alluvial areas.

Portions of western Utah also include a transition zone of the Basin and Range province into what is locally referred to as the "West Desert" landscape. This landscape includes portions of the Sevier Desert and Sevier Lake. The topography within this area is extremely flat and includes large playas or mud flat areas, that exhibit little landform diversity. Again, these areas are divided by rugged, rocky mountain ranges.

Earth resource features that have a high sensitivity are landslide hazard areas, areas of high paleontological sensitivity, soils with either a high wind erosion or high water erosion hazard, areas of active mining, perennial streams and lakes, springs, and wetland areas. Significant

paleontological resources are found at the Hagerman Fossil Beds National Monument near Hagerman, Idaho.

Twelve vegetative communities have been identified in the SWIP study corridors, including shadscale, greasewood, samphire-iodine bush, Great Basin sagebrush, Mojave desertscrub, grassland, wetlands, riparian areas, piñon-juniper, alpine tundra, limber/bristlecone pine, and quaking aspen. These vegetation types support a large variety of mammals, birds, amphibians, and reptiles.

Approximately 560 species of vertebrates are likely to occur, over the course of a year in habitats traversed by the alternative routes.

Seventy species of fish are known to occur within aquatic habitats within the study corridors. Native and introduced game fish are present in warm and cold water lakes, ponds, and reservoirs, and in perennial streams and rivers. Others inhabit hot and cold springs and marshes. Approximately 31 percent of the fish fauna occupying waters within the study corridors are introduced.

Fifteen species of amphibians are expected to occur in aquatic, riparian, and wetland habitats in the study corridors. Sixty-two species of reptiles potentially occur in terrestrial habitats within study corridors.

A total of 111 species of mammals are expected to occur within habitats traversed by alternative routes. Small mammals including rodents, lagomorphs (rabbits and hares), bats, and shrews are the most numerous, although not readily observed. Nearly half of the mammals that may occur within the study corridors are rodents (51 species). Large mammals include 19 species of carnivores (e.g., lynx, wolverine, etc.) and five species of native ungulates (e.g., antelope, mule deer, bighorn sheep).

Free roaming horses (*Equus caballus*) and burros (*E. asinus*) occur on public lands in the study corridors. These animals are descendants of horses and burros that escaped from man or were turned out onto the open range.

In recent years, dramatic declines in tortoise population numbers have been observed throughout much of its range, including southern Nevada. A number of factors have contributed to the observed decline, including loss of habitat to development, degradation of habitat from livestock grazing, disease, predation on juveniles by ravens attracted to areas where human refuse accumulates, illegal collection, and off-road vehicle use. The Mojave population of the desert tortoise was formally listed as a federally threatened species by the United States Department of Interior Fish and Wildlife Service in April 1990. Concern has been expressed for the maintenance of viable populations in Clark County, Nevada, and especially the Las Vegas Valley where rapid commercial and residential development is occurring.

Declines in sage grouse numbers are largely associated with destruction of sagebrush habitat. Conversion of sagebrush to agricultural lands, and attempts to convert sagebrush areas to grassland for livestock grazing are a few of the human developments contributing to the decrease in grouse numbers.

The majority of the lands crossed by the alternative routes are used for cattle grazing and are classified as rangeland. Other significant uses within the study corridors include agriculture, mining, airports and airstrips, utilities, commercial, governmental and other industrial facilities. Residences near urban areas and in remote locations, both occupied and unoccupied are located within the study

corridors. Principal urban areas or residential concentrations in or near the study corridors include the following:

- Hagerman, Eden, and Hansen in Idaho
- Wells, Ely, Currie, Jackpot, Oasis, Baker, and McGill in Nevada
- Delta, Eskdale, and Hinckley in Utah

Several alternative routes in Utah and Nevada could potentially affect military aircraft operations at Hill Air Force Base in Utah and Nellis Air Force Base in southern Nevada.

Approximately half of the lands crossed by the study corridors in Idaho fall into the category of agriculture. The high-desert lands of the Snake River Valley are fertile and productive when irrigated. Many of the lands crossed in Idaho are classified as prime or important farmland by the Soil Conservation Service.

Dispersed recreation occurs throughout these areas in Nevada, Idaho, and Utah. Developed campsites and recreation areas are usually located along perennial streams or reservoirs. Great Basin National Park, near Baker, Nevada is passed by several of the alternative Ely to Delta segment routes. Several wilderness study areas (WSAs) inventoried within the study corridors include portions of Salmon Falls Creek WSA in Idaho and 14 WSAs in Nevada including South Pequop, Bluebell, Goshute Peak, Goshute Canyon, Marble Canyon, Mount Grafton, Fortification Range, Delamar Mountains, Evergreen, Meadow Valley Mountains, Fish and Wildlife 1, 2 & 3, and Arrow Canyon. WSAs within Utah include Howell Peak, King Top, Notch Peak, Fish Springs, Wah Wah Mountains, and Swasey Mountain.

Cultural resources are historic and traditional cultural properties that reflect our nation's heritage. Federal regulations define such historic properties to include prehistoric and historic sites, buildings, structures, districts, and objects included in, or eligible for inclusion in the National Register of Historic Places, as well as artifacts, records, and remains related to such properties. These regions of Nevada, Idaho, and Utah have been occupied for thousands of years. This section briefly summarizes what is known about this long history of human use of the region. More details are provided in this document and in the technical reports (Rogge 1991).

Prehistory - The project area overlaps portions of two culture areas, the Great Basin and the Colorado Plateau, but the vast majority of the project area is within the "cultural," if not the geographic, Great Basin. The extreme southern portion is along the western margin of the Colorado Plateau. Within the study area three prehistoric cultural stages, Paleo-Indian, Archaic, and Formative are represented and local phases or variations within each stage have been defined.

Ethnohistory - During the ethnohistoric era, these regions of Nevada, Idaho, and Utah were occupied by the Northern Shoshone, Bannock, Western Shoshone, Pahvant Ute, and Southern Paiute. Generally speaking, the Northern Shoshone and Bannock inhabited the study corridors in southern Idaho. The Western Shoshone ranged through eastern Nevada and northwestern Utah. The central portion of Utah was occupied by the Pahvant Ute while the Southern Paiute inhabited southwestern Utah and southern Nevada.

History - After the arrival of Europeans in the New World, portions of the study corridors were claimed by Spain, Great Britain, France, Mexico, and Canada, as well as the United States. The earliest European exploration was led by Escalante who skirted the eastern margin of the study area in Utah. After the famous Lewis and Clark Expedition to the Pacific Coast in 1804-1806, fur

trappers and mountain men were lured to the Rocky Mountains until the decline of fur trading in about 1840.

Environmental Consequences

The consequences, or impacts, to the environment caused by implementing the SWIP were assessed by considering the existing condition of the environment and the effects of the activities of the SWIP (construction, operation, and maintenance) on the environment. The "initial" impacts were evaluated to determine if mitigation measures would be effective in lessening the impacts. Those impacts remaining after mitigation measures were applied are referred to as "residual" impacts. Many of the identified impacts would be considered to be adverse, direct, and long-term. Some impacts (e.g., visual, cultural, and biological impacts) would be considered adverse, indirect, and long-term.

The principal type of impacts associated with earth resources is the potential for increased erosion hazards, although some short-term soil compaction impacts could occur in agricultural areas and some stream sedimentation could also occur at the crossings of perennial streams.

Typical impacts to biological resources include effects on threatened, endangered, or protected species, rare or unique vegetation types, migration corridors for wildlife, areas of low revegetation potential, or highly productive wildlife habitat. The impacts would generally be associated with the removal of vegetation and habitat cause by construction and operation activities, and from human activity from more access into remote areas. The presence of the transmission towers would increase the potential for long-term predation of sage grouse by golden eagles on adult and immature birds. Adding towers also would provide roost/hunting sites for ravens and magpies, thus increasing the long-term potential for predation on grouse nests.

Land use impacts include those that would displace, alter, or otherwise physically affect any existing or planned residential, commercial, or industrial use or activity, any agricultural use, or any recreational, preservation, educational, or scientific facility or use. Few land use impacts would occur from the construction of the SWIP, although the impacts that would occur would be long-term.

Potential socioeconomic effects could include construction-period impacts to area communities, social and economic impacts along the selected route, and fiscal impacts within local jurisdictions. These effects could be both adverse and beneficial.

Visual impacts would be considered adverse, indirect, and long-term. They include effects to the quality of any scenic resource, the view from any residential or other sensitive land use or travel route, or the view from any recreation, preservation, education, or scientific facility. Potential visual impacts to existing and proposed sensitive viewpoints for Great Basin National Park are a concern. Other visual impacts would be generally associated with residential concentrations or dispersed homes, scenic roads and highways, and recreation viewpoints, including wilderness areas and WSAs.

Direct, adverse physical impacts could occur to cultural resources during construction, while indirect impacts could result after construction due to increased erosion or increased public access to sites

along the transmission line right-of-way. Adverse visual effects may occur to sites with high aesthetic or interpretive values.

Potential electrical, biological, health and safety effects from the Agency Preferred Alternatives were assessed. These include corona effects, electric and magnetic field effects, and public safety.

The Stateline Resource Area is currently preparing a Resource Management Plan (RMP) which would designate utility corridors. The RMP corridor studies and the SWIP EIS studies have been coordinated, and the preferred alternatives are similar. The Federal Land Policy and Management Act of 1976 mandates to the extent practical that the BLM consolidate future utility projects within the corridor that is established.

Public Issues and Management Concerns

Need for Project - The public and agencies expressed a concern about the need for the project.

Maximize Use of Public Lands - One of the major public comments was utilizing public lands for routing the transmission line since the line would offer no direct benefit to private landowners and would also interfere with agricultural operations.

Visual Impacts - The study area is characterized by relatively open, uninterrupted views with minimal overstory vegetation cover. Significant concern is expressed over the views from the parks, recreation, residence, and preservation areas, views from highways, scenic routes, sensitive cultural sites, and impacts affecting inherent aesthetic value of the landscape.

Minimize Impacts to Biological Resources - There is a wide variety of both vegetation and wildlife in the project area. A total of twelve vegetation communities were identified within the SWIP study corridors with 73 plant species identified as sensitive on the state and/or federal level. Wetlands do occur in the project area, but would be avoided. Within the project area, there are 560 species of vertebrates, 111 species of mammals, 15 species of amphibians, and 70 species of fish. Issues for wildlife species and important wildlife habitats are related primarily to increased public access into remote areas and/or ground disturbance. Ground disturbance caused by construction of the transmission line could result in habitat loss and destruction. Increased public access may result in more harassment for all wildlife. There is considerable public concern regarding the tortoise hatchlings falling prey to ravens, and raptors colliding with transmission lines.

Cultural Resources - The project area has been occupied for thousands of years, and contains a long history of human use. Thousands of cultural sites have been recorded, but only a few have been formally inventoried. The public and agencies are aware of the archeological sites and are concerned that many of these sites would be impacted due to construction and increased accessibility.

Health and Safety - In recent years there has been growing public concern over the possible effects that electromagnetic fields (EMF) could have on human health. Some studies have shown a statistical association between EMF and certain diseases, while other studies have failed to show this relationship. Ongoing research into EMF has detected no cause-and-effect relationship between EMF and disease. While EMF can produce biological effects, it is unclear whether these effects

would be of any consequence to human health. Please refer to Chapter 3 of this document for a discussion of recent EMF research results.

Wilderness/Wilderness Study Areas (WSAs) - One wilderness area and a number of WSAs are found in or near the study corridors for the SWIP. The agencies and the public are concerned about the presence of the transmission line on adjacent lands potentially affecting the designation of WSAs as wilderness.

Minimize Land Use Impacts - The primary issues associated with the construction of the transmission line would be expected to occur from conflicts with the land uses found throughout the project area (i.e., agricultural lands, irrigation systems, airport clear zones, residences, and planned development).

Use Existing Transmission Line Corridors - Both the public and agencies expressed a desire to locate the transmission line along existing transmission corridors, wherever possible, to minimize environmental impacts.

Property Values and Compensation - Private property owners expressed a concern for a decrease in the monetary value of their property as a result of the proposed transmission line, and whether or not they would receive adequate compensation for property loss.

Effects of Alternatives on Agency Land Management Plans - The BLM plans and designates corridors for linear utility use. Portions of the Agency Preferred Alternatives (Midpoint to Dry Lake segment and Ely to Delta segment), evaluated along with other alternatives in the SWIP DEIS/DPA and in this document, would not follow designated or planning utility corridors. Several BLM resource management plans would be amended by approval of this document (refer to Proposed Plan Amendments in Chapter 1).

Route Comparisons

The comparative environmental consequences are summarized below for each of the final alternative routes. This summary compares only a few of the many resources evaluated. For a complete comparison, see Table 1-1 and 1-2 in this document.

Midpoint to Dry Lake Segment

Route A:

- crosses 131.1 miles within Military Operating Areas (MOAs) of Hill and Nellis Air Force Bases
- crosses 35.2 miles of sage grouse leks and wintering range
- crosses 15.3 miles of bald eagle habitat
- crosses 53.2 miles of desert tortoise habitat
- crosses 1.3 miles near ferruginous hawk nests
- crosses 24.1 miles of crucial pronghorn habitat
- crosses 39.0 miles of potential high water erosion soils
- crosses 58.8 miles of potential high wind erosion soils
- 370.4 miles in designated or planning corridor
- 142.6 miles outside designated or planning corridor
- crosses 18.4 miles of predicted high sensitivity cultural zones
- crosses 95.2 miles of private land

Route B:

- crosses 182.9 miles within MOAs of Hill and Nellis Air Force Bases
- crosses 36.8 miles of sage grouse leks and wintering range
- crosses most (32.8) miles of bald eagle habitat
- crosses 53.2 miles of desert tortoise habitat
- crosses 1.4 miles near ferruginous hawk nests
- crosses least (7.2) miles of crucial pronghorn habitat
- crosses most (53.1) miles of potential high water erosion soils
- crosses 58.9 miles of potential high wind erosion soil
- 363.1 miles in designated or planning corridor
- 153.0 miles outside designated or planning corridor
- crosses 19.3 miles of predicted high sensitivity cultural zones
- crosses 97.3 miles of private land

Route C:

- crosses 131.1 miles within MOAs of Hill and Nellis Air Force Bases
- crosses 30.7 miles of sage grouse leks and wintering range
- crosses 16.3 miles of bald eagle habitat
- crosses 53.2 miles of desert tortoise habitat
- crosses 1.3 miles near ferruginous hawk nests
- crosses 16.2 miles of crucial pronghorn habitat
- crosses 44.4 miles of potential high water erosion soils
- crosses 58.8 miles of potential high wind erosion soils
- 337.0 miles in designated or planning corridor
- 169.9 miles outside designated or planning corridor
- crosses 17.2 miles of predicted high sensitivity cultural zones
- crosses 104.6 miles of private land

Route D:

- crosses 129.5 miles within MOAs of Nellis Air Force Bases
- crosses 34.1 miles of sage grouse leks and wintering range
- crosses least (5.8) miles bald eagle habitat
- crosses 53.2 miles of desert tortoise habitat
- crosses 1.3 miles near ferruginous hawk nests
- crosses 34.9 miles of crucial pronghorn habitat
- crosses least (35.5) miles of potential high water erosion soils
- crosses 52.1 miles of potential high wind erosion soils
- 377.1 miles in designated or planning corridor
- 136.4 miles outside designated or planning corridor
- crosses 20.5 miles of predicted high sensitivity cultural zones
- crosses 98.7 miles of private land

Route E:

- crosses 182.9 miles within MOAs of Hill and Nellis Air Force Bases
- crosses 36.3 miles of sage grouse leks and wintering range
- crosses 18.2 miles of bald eagle habitat
- crosses 53.2 miles of desert tortoise habitat
- crosses 1.3 miles near ferruginous hawk nests
- crosses 18.6 miles of crucial pronghorn habitat
- crosses 48.6 miles of potential high water erosion soils
- crosses 64.3 miles of potential high wind erosion soils
- 365.6 miles in designated or planning corridor
- 158.1 miles outside designated or planning corridor
- crosses 18.4 miles of predicted high sensitivity cultural zones
- crosses 88.5 miles of private land

Route F:

- crosses 131.1 miles within MOAs of Hill and Nellis Air Force Bases
- crosses 32.8 miles of sage grouse leks and wintering range
- crosses 16.3 miles of bald eagle habitat
- crosses 53.2 miles of desert tortoise habitat
- crosses 1.3 miles near ferruginous hawk nests
- crosses 16.5 miles of crucial pronghorn habitat
- crosses 47.8 miles of potential high water erosion soils
- crosses most (73.3) miles of potential high wind erosion soils
- least (329.1) miles in designated or planning corridor
- most (194.9) miles outside designated or planning corridor
- crosses least (11) miles of predicted high sensitivity cultural zones
- crosses most (115.6) miles of private land
- visual impacts to Hagerman Fossil Beds National Monument
- impacts airstrip used by agricultural spraying operations

Route G:

- crosses 131.1 miles within MOAs of Hill and Nellis Air Force Bases
- crosses 40.6 miles of sage grouse leks and wintering range
- crosses 19.6 miles of bald eagle habitat
- crosses 53.2 miles of desert tortoise habitat
- crosses 1.4 miles near ferruginous hawk nests
- crosses 39.7 miles of crucial pronghorn habitat
- crosses 36.4 miles of potential high water erosion soils
- crosses 46.7 miles of potential high wind erosion soils
- most (379.4) miles in designated or planning corridor

- least (125.3) miles outside designated or planning corridor
- crosses most (20.6) miles of predicted high sensitivity cultural zones
- crosses 85.3 miles of private land
- reduces visual impacts to U.S. Highway 93

Utility:

- crosses 131.1 miles within MOAs of Hill and Nellis Air Force Bases
- crosses most (42.2) miles of sage grouse leks and wintering range
- crosses 19.6 miles of bald eagle habitat
- crosses 53.2 miles of desert tortoise habitat
- crosses 1.4 miles near ferruginous hawk nests
- crosses 39.7 miles of crucial pronghorn habitat
- crosses 36.4 miles of potential high water erosion soils
- crosses least (44.1) miles of potential high wind erosion soils
- 376.3 miles in designated or planning corridor
- least (125.3) miles outside designated or planning corridor
- crosses 20.5 miles of predicted high sensitivity cultural zones
- crosses 87.0 miles of private land
- reduces visual impacts to U.S. Highway 93

Agency Preferred Alternative:

- crosses 146.6 miles within MOAs of Nellis Air Force Bases
- crosses 37.2 miles of sage grouse leks and wintering range
- crosses 6.0 miles of bald eagle habitat
- crosses 53.2 miles of desert tortoise habitat
- crosses 1.3 miles near ferruginous hawk nests
- crosses most (43.2) miles of crucial pronghorn habitat
- crosses 37.3 miles of potential high water erosion soils
- crosses least (49.5) miles of potential high wind erosion soils
- 370.4 miles in designated or planning corridor
- 132.7 miles outside designated or planning corridor
- crosses 18.4 miles of predicted high sensitivity cultural zones
- crosses least (83.1) miles of private land
- reduces visual impacts to U.S. Highway 93

Ely to Delta Segment

Direct Route:

- crosses 55.1 miles within R-6405 Restricted Area
- crosses 130 miles within restricted air space and MOAs of Utah Testing and Training Range (UTTR)
- crosses 7.9 miles of sage grouse leks and wintering range
- crosses 7.0 miles of bald eagle habitat
- does not cross ferruginous hawk nesting areas
- crosses least (56.5) miles of crucial pronghorn habitat
- crosses least (6.8) miles of potential high wind erosion soils
- least (14.3) miles in designated or planning corridor
- 115.8 miles outside designated or planning corridor
- crosses least (0.8) miles of predicted high sensitivity cultural zones
- crosses least (0.0) miles of private land

- shortest route and crosses least public and private land
- avoids visual impacts to Great Basin National Park
- crosses wetlands known as the Leland-Harris Spring Complex

Cutoff Route:

- crosses 104.2 miles within MOAs of UTTR
- crosses 6.8 miles of sage grouse leks and wintering range
- crosses 8.4 miles of bald eagle habitat
- does not cross ferruginous hawk nesting areas
- crosses 70.1 miles of crucial pronghorn habitat
- crosses 12.7 miles of potential high wind erosion soils
- 75.5 miles in designated or planning corridor
- 78.4 miles outside designated or planning corridor
- crosses least (0.8) miles of predicted high sensitivity cultural zones
- crosses least (0.0) miles of private land
- insignificant visual impacts to viewpoints within Great Basin National Park

230kV Corridor Route: (Agency Preferred Alternative)

- crosses 102.5 miles within MOAs of UTTR
- crosses 7.1 miles of sage grouse leks and wintering range
- crosses most miles (17.8) of bald eagle habitat
- crosses 4.5 miles of ferruginous hawk nests
- crosses 71.5 miles of crucial pronghorn habitat
- crosses 19.2 miles of potential high wind erosion soils
- most (145.9) miles in designated or planning corridor
- least (14.9) miles outside designated or planning corridor
- crosses most (8.0) miles of predicted high sensitivity cultural zones
- crosses (10.2) miles of private land
- utilizes existing 230kV corridor
- crosses most private and national forest lands
- insignificant visual impacts to viewpoints within Great Basin National Park

Southern Route:

- crosses least amount of MOAs of UTTR
- crosses 11.8 miles of sage grouse leks and wintering range
- does not cross bald eagle habitat
- crosses the most (10.1) miles of ferruginous hawk nests
- crosses most (85.7) miles of crucial pronghorn habitat
- crosses most miles (40.0) miles of potential high wind erosion soils
- 49.5 miles in designated or planning corridor
- most (161.5) miles outside designated or planning corridor
- crosses 6.0 miles of predicted high sensitivity cultural zones
- crosses (1.6) miles of private land
- highest overall environmental impacts
- longest route

Preferred Alternative Selection

Based upon review of potential impact characterizations, significant, unavoidable adverse effects, agency and public comments, and cumulative environmental consequences of the alternative routes, the preferred routes were identified (refer to Identification of Preferred Alternatives in Chapter 2 in the DEIS/DPA and page 1-9 of this document).

Route A is the Environmentally Preferred Route for the Midpoint to Dry Lake segment. The least impact route on the Ely to Delta segment is the Cutoff Route, however the 230kV Corridor Route would cause similar environmental impacts and would be environmentally acceptable. Because of the utilities future need to interconnect with the 230kV system in the Ely area, the potential cumulative environmental effects from the Cutoff Route would be more significant than the cumulative effects from the 230kV Corridor Route (refer to the Cumulative Effects section in Chapter 3 of this document). Therefore, because the 230kV Corridor Route would likely cause fewer future cumulative effects in the Ely area, this route is environmentally preferred.

The Agency Preferred Alternative for the Midpoint to Dry Lake segment is a combination of Route A and Route G. The Agency Preferred Alternative for the Ely to Delta segment is the 230kV Corridor Route. The Agency Preferred Alternative substation sites include: Site #4 of the Thousand Springs siting area, Site #10 of the Robinson Summit siting area, Site #14 of the Intermountain siting area and in the Dry Lake siting area, all of the potential substation sites are environmentally acceptable and will be determined through the analysis of the Marketplace-Allen Transmission Project. The Agency Preferred Alternative proposes to construct microwave communication facilities at Hansen Butte, Cottonwood, Ellen D, Six Mile, Rocky Point, Spruce Mountain, Long Valley, Copper, Cave Mountain, Mount Wilson, Highland Peak, Beaver Dam Mountain, and Glendale.

The IPCo prefers the Agency Preferred Alternative route for the Midpoint to Dry Lake segment with two important modifications:

- prefer Link 102 over Links 715 and 713 near Contact, Nevada
- prefer Link 280 over Link 291 north of the Robinson Summit Substation site

The Utility Preferred Route on the Ely to Delta segment is the 230kV Corridor Route.

The significant, unavoidable adverse effects of the Agency Preferred Alternative involve biological, visual, and cultural resources only, as summarized below:

Resource Category	**Significant Unavoidable Adverse Impacts**
Biological Resources	On the routes between Midpoint Substation and Dry Lake, Route A would potentially cross 3.2 miles of riparian habitat (although none is actually expected to be disturbed), 52.1 miles of sensitive desert tortoise habitat, and 35.2 miles of sage grouse leks and wintering range. Route G would potentially disturb 4.8 miles of riparian habitat, a similar disturbance to desert tortoise, and 40.6 miles of sage grouse leks and wintering range.

Resource Category	Significant Unavoidable Adverse Impacts
	On the Ely and Delta segment, the Cutoff Route would potentially cross 1.2 miles of riparian habitat (although none is actually expected to be disturbed) and 6.8 miles of sage grouse leks and wintering range. The 230kV Corridor Route would potentially disturb 0.9 miles of riparian habitat and 7.1 miles of sage grouse leks and wintering range. Although riparian areas and desert tortoise are significant issues, the impacts would be largely mitigated. Impacts to sage grouse habitat would be significant where there are no existing transmission lines.
Visual Resources	On the Midpoint Substation and Dry Lake segment, Route A would potentially result in 13.5 miles of significant impacts to the area's visual resources. Significant impacts are predicted to approximately 83 residences within one mile of the route, and to one scenic highway. The route would cross 7.3 miles of the BLM and the FS lands managed to retain visual quality (VRM Class II and VQO Retention, respectively). Route G would potentially result in 14.7 miles of high impacts to the area's visual resources. Impacts are predicted to approximately 93 residences within one mile of the route, and to one scenic highway crossed. On the Ely and Delta segment, the Cutoff Route would potentially result in 1.2 miles of significant impacts to the area's visual resources. Significant impacts are predicted to 2 residences within one mile of the route. The 230kV Corridor Route would potentially result in 7.3 miles of high impacts to the area's visual resources. Impacts are predicted to approximately 26 residences within one mile of the route.
Cultural Resources	On the routes between Midpoint Substation and Dry Lake, Route A would potentially result in 6.8 miles of significant impacts to cultural resources. Among the 454 sites identified within one mile, 53 are historic, 13 are ethnohistoric, and 388 are prehistoric. Route G would potentially result in 7.3 miles of significant impacts to cultural resources. Among the 474 sites identified within one mile, 61 are historic, 14 are ethnohistoric, and 399 are prehistoric. On the Ely to Delta segment, the Cutoff Route would potentially result in 4.6 miles of significant impacts to cultural resources. Among the 39 sites identified within one mile, 5 are historic, 8 are ethnohistoric, and 26 are prehistoric. The 230kV Corridor Route would potentially result in 5.5 miles of significant impacts to cultural resources. Among the 100 sites identified within one mile, 12 are historic, 8 are ethnohistoric, and 80 are prehistoric.

TABLE OF CONTENTS

TABLE OF CONTENTS

CHAPTER 1 - PROPOSED PLAN

CHAPTER 2 - PUBLIC PARTICIPATION

CHAPTER 3 - MODIFICATIONS AND ADDITIONAL STUDIES

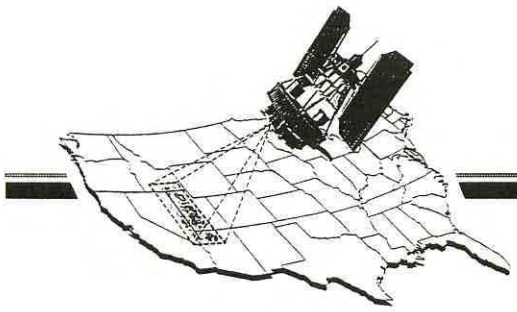
CHAPTER 4 - ERRATA

CHAPTER 5 - COMMENTS AND RESPONSES TO THE DEIS/DPA

LIST OF FIGURES

LIST OF TABLES

NOTE: All tables are located at the end of their respective chapters.



CHAPTER 1

PROPOSED PLAN

CHAPTER 1
PROPOSED PLAN

INTRODUCTION

The Idaho Power Company (IPCo) proposes to construct, operate, and maintain the Southwest Intertie Project (SWIP), a single-circuit, overhead 500kV transmission line between the existing Midpoint Substation near Shoshone, Idaho, and a proposed substation site in the Dry Lake Valley northeast of Las Vegas, Nevada. The line would be supported by V-guyed and self-supporting steel-lattice, and steel-pole H-frame structures placed an average of 1500 feet apart.

The IPCo is also proposing the construction, operation, and maintenance of a single-circuit, overhead 500kV transmission line to connect from a point near Ely, Nevada, east to a proposed substation near Delta, Utah. This segment of the SWIP is referred to in the Draft Environmental Impact Statement/Draft Plan Amendment (DEIS/DPA) as the Crosstie (hereafter referred to as the Ely to Delta segment). The line would be supported by self-supporting steel-lattice and steel-pole H-frame structures placed an average of 1500 feet apart. Land rights for the Ely to Delta segment would be obtained in the name of the IPCo. The IPCo has entered into an agreement with Los Angeles Department of Water and Power (LADWP) to convey this segment of the right-of-way grant with the approval of the BLM to the LADWP on behalf of the Utah-Nevada Transmission Project (UNTP). This is referred to as the "Delta Grant" in the agreement. The agreement further states that the IPCo would conduct the necessary environmental permitting for the Delta Grant and then request that the BLM assign it to the LADWP for construction, operation, and maintenance. The UNTP participants include utilities in Utah, Nevada, and California.

In 1988, the IPCo applied for a right-of-way grant to construct and operate a transmission interconnection from their 500kV Midpoint Substation near Shoshone, Idaho to a proposed substation site in the Delta, Utah area. In the Delta area, the IPCo was proposing to interconnect with and obtain transmission capacity on the UNTP, a proposed 500kV transmission line from Delta to a proposed substation site located approximately 13 miles southwest of Boulder City, Nevada. The proposal also included the line segment between Ely and Delta, which was proposed to be developed as a second phase of the UNTP.

In early 1990, the IPCo determined that the UNTP would be fully subscribed and would not be able to provide the transmission capacity for the SWIP to reach the proposed substation near Boulder City, Nevada. The IPCo decided that the SWIP would have to be extended south from the Ely area in order to meet the purpose and need for the SWIP project to interconnect in the Las Vegas area. In June 1990, the SWIP studies were expanded to include routes from the Ely, Nevada area to a proposed substation site northeast of Las Vegas in the Dry Lake valley.

The SWIP Ely to Delta segment was originally a joint SWIP and UNTP transmission line segment. When the SWIP right-of-way application to the Bureau of Land Management (BLM) was amended in June 1990, the IPCo's need for the Ely to Delta segment changed. However, the Ely to Delta segment remains an important part of the UNTP and the need for it remains unchanged.

The lead federal agency for the SWIP, the BLM, recommended that this transmission segment be retained in the SWIP Environmental Impact Statement/Plan Amendment (EIS/PA) process. This

nearly 160-mile transmission line segment would extend east from the vicinity of Ely, Nevada, to near Delta, Utah. The right-of-way for this segment would be granted to the IPCo, who would request that the BLM assign it to the LADWP. The LADWP would, on behalf of the UNTP participants, construct, operate, and maintain this portion of the line and a proposed substation near the Intermountain Generating Station near Delta, Utah.

The IPCo proposes to assign the Ely to Delta portion of the right-of-way grant, if approved, to the LADWP. The LADWP has been involved in all aspects of the EIS process. The BLM Ely (Nevada) and Richfield (Utah) District have also participated in every step of the EIS process, and will be involved in the decision process with the rest of the potentially affected BLM districts. If a right-of-way grant is assigned for the SWIP Ely to Delta segment, the BLM would coordinate directly with the UNTP participants during development of the Construction, Operation, and Maintenance Plans, as well as the actual construction, operation, and maintenance of the project. Also refer to the expanded discussion of Purpose and Need in Chapter 3 of this document.

THE PROPOSED PLAN

The Agency Preferred Alternative is to grant the IPCo a 200-foot right-of-way across nearly 700 miles of lands administered by the BLM, Forest Service (FS), Bureau of Reclamation, and private owners. This route is a combination of Routes A and G, for the Midpoint to Dry Lake segment of the SWIP and the 230kV Corridor Route for the Ely to Delta segment of the SWIP (refer to Figure 1-1 for a map of the Proposed Plan and to the Alternative Routes map in the Map Volume accompanying the SWIP DEIS/DPA). The Agency Preferred Alternative also includes four proposed substations or series compensation sites, expansion of the Midpoint Substation in southern Idaho, a series compensation station in the Delamar Valley in southeastern Nevada (exact site not yet selected and subject to additional environmental permitting) and the 13 sites for microwave communication facilities. The Proposed Plan Amendment is to designated a utility corridor along the Agency Preferred Alternative to accommodate the SWIP 500kV transmission line where this route deviates from agency designated and planning corridors.

Midpoint to Dry Lake Segment

The SWIP Midpoint to Dry Lake segment is proposed as a 500,000-volt (500kV) alternating current (AC) transmission line with an estimated capacity rating of 1200 megawatt (MW). The over 500-mile long line would extend from the existing Midpoint Substation near Shoshone, Idaho to a proposed substation near the Dry Lake Valley northeast of Las Vegas, Nevada.

The towers for the Midpoint to Dry Lake segment would range from 90-160 feet in height, but would average 120-130 feet. Towers would be spaced approximately 1200-1500 feet apart depending upon terrain and other construction factors. The SWIP Midpoint to Dry Lake segment would be constructed generally using the following tower types:

- V-guyed (or other guyed) steel lattice or self-supporting steel lattice
- steel-pole H-frame in agricultural areas
- self-supporting steel lattice at specific intervals for lateral support

The Midpoint to Dry Lake segment would involve crossing several districts of the BLM in Idaho and Nevada. The section of this chapter - Proposed Plan Amendments lists the BLM Districts and Resource Area land use plans that would be affected by the Plan Amendment. Figure 1-1 illustrates the Agency Preferred Alternative for the Midpoint to Dry Lake segment in relation to the alternatives compared in the SWIP DEIS/DPA (a combination of Routes A and G) that would utilize Links 10, 20, 41, 40, 50, 70, 711, 714, 101, 715, 713, 110, 130, 150, 151, 152, 200, 221, 223, 212, 230, 241, 242, 244, 270, 291, 293, 310, 340, 362, 363, 669, 670, 672, 673, 675, 690, 700, and 720 (also refer to Figure 1-1 in this document or the Alternative Routes map in the Map Volume accompanying the SWIP DEIS/DPA Map Volume).

The Agency Preferred Alternative would require equipment additions to the Midpoint Substation, one proposed substation near Ely, Nevada, and a proposed substation in the Dry Lake Valley in southern Nevada. A Series compensation station would be needed to increase the electrical performance of the system northeast of Wells, Nevada, which is about halfway between the two northern substation sites. This series compensation station near Wells may be expanded to accommodate switching equipment (substation) in the future. Another series compensation station would be required in the Delamar Valley in southern Nevada.

The proposed substation and series compensation sites for the Midpoint to Dry Lake segment include:

- Site 4 at the Thousand Springs Series Compensation Siting Area northeast of Wells, Nevada
- Site 10 at the Robinson Summit Substation Siting Area near Ely, Nevada
- Delamar Valley Series Compensation Siting Area (If this facility is required the specific location would be determined later with a separate Environmental Assessment prior to construction.)
- One of the three proposed substation sites (Site 17, 18, or 20) at the Dry Lake Substation Siting Area (Site selection would depend on the final routing decision for the Marketplace-Allen Transmission (MAT) Project. If the MAT is routed south through the Apex Industrial Area the Agency Preferred Alternative site would be either Site 17 or 18. If the MAT is routed south and east of the Dry Lake Range the Agency Preferred Alternative site would either be Site 18 or 20).

A new microwave communication system to operate the system would also be required between Midpoint Substation and the proposed substation at Dry Lake. The 13 proposed microwave communication sites for the Midpoint to Dry Lake segment include:

• Hansen Butte	developed site, power supply exists
• Cottonwood	undeveloped site, install solar power system
• Ellen D	developed site, install solar power system
• Six Mile	1/2 mile from developed site, install solar power system
• Rocky Point	developed site, power supply exists
• Spruce Mountain	developed site, install solar power system
• Long Valley	undeveloped site, install solar power system
• Copper	developed site, power supply exists
• Cave Mountain	developed site, power supply exists

- Mount Wilson — developed site, power supply exists
- Highland Peak — developed site, power supply exists
- Beaver Dam Mountain — developed site, power supply exists
- Glendale — developed site, power supply exists

The microwave communication sites would be located on developed sites to the extent possible. No ground disturbing activities would occur at three of these sites: Hansen Butte, Beaver Dam Mountain, and Glendale. At these sites, changes would consist of the addition of some equipment and a dish at the existing microwave communication facilities.

Ground wire having fiber optic capability may be installed rather than traditional ground wire to serve the needs of commercial communication companies. If this is done the fiber optic network could also be used to facilitate project communication needs. If installed, access to the fiber optic ground wire by a commercial communications company would only be allowed upon completion of all environmental permitting activities (e.g., National Environmental Policy Act) and obtaining the right-of-way. Regeneration stations would be needed at 20-40 mile intervals along the transmission line right-of-way and are typically small concrete buildings approximately 10 feet by 10 feet. They would likely be placed on or immediately adjacent to the SWIP right-of-way (also refer to Potential Fiber Optic Ground Wire in the Cumulative Effects section of Chapter 3 of this document and Right-of-Way Acquisition and Communication Facilities in the SWIP DEIS/DPA).

Where the Midpoint to Dry Lake segment would parallel the UNTP, the rights-of-way of the SWIP and the UNTP would need sufficient separation to meet reliability and outage criteria of the Western States Coordinating Council (WSCC) (also refer to page 1-2 of the SWIP DEIS/DPA and the section on Right-of-Way in Chapter 3 of this document). The UNTP and the Midpoint to Dry Lake segment of the SWIP would converge near Robber's Roost Hills (Link 675 - milepost 12), and would travel parallel for approximately 88.5 miles (Links 690, 700, and 720 - milepost 15) into Coyote Spring Valley in southern Nevada, where the UNTP would continue south and the Midpoint to Dry Lake segment of the SWIP would cross through the southern end of the Arrow Canyon Range into the Dry Lake Valley. The involved regional utilities would coordinate with the Las Vegas District of the BLM on the final configuration of this corridor (i.e., tower spacing, separation, crossings, etc.)

The Midpoint to Dry Lake segment, with its proposed southern connection to the Dry Lake substation, would require interconnection with the Marketplace-Allen Transmission Project (MAT). The Notice to Proceed for construction of the SWIP, from Ely to Dry Lake, would be contingent on approval of the MAT or a similar transmission facility which would interconnect the proposed Dry Lake Substation to the proposed marketplace substation (also refer to the Cumulative Effects section in Chapter 3).

The Midpoint to Dry Lake segment of the SWIP is scheduled to begin commercial operation by late 1997. Construction would begin in 1995. Refer to Table 1-1 of this document for a comparison of environmental impacts between routes.

Ely to Delta Segment

The SWIP Ely to Delta segment is proposed as a 500kV AC transmission line with an estimated capacity rating of 1100 MW. The nearly 160-mile long line would extend from a proposed

substation near the Intermountain Power Facilities near Delta, Utah, to a proposed substation located in the vicinity of Ely, Nevada (same substation near Ely as for the Midpoint to Dry Lake segment).

The Ely to Delta segment is a joint effort between the UNTP participants and the SWIP participants. Idaho Power Company, on behalf of the SWIP, is responsible for the licensing and permitting. The LADWP on behalf of the UNTP, would construct and operate the SWIP Ely to Delta segment.

The towers for the Ely to Delta segment would range from 90-160 feet in height, but would average 120-130 feet. Towers would be spaced approximately 1200 to 1500 feet apart, depending upon terrain and other construction factors. The Ely to Delta segment would be constructed using:

- self-supporting steel lattice structures
- steel pole H-Frame structures for visual mitigation and agricultural areas

The Ely to Delta segment would cross three different BLM Districts in Utah and Nevada and a portion of the Humboldt National Forest in Nevada. The section on Proposed Plan Amendments later in this chapter lists the BLM Districts and Resource Areas that would be affected by the proposed Plan Amendment. Figure 1-1 illustrates the 230kV Corridor Route as the Agency Preferred Alternative for the Ely to Delta segment, which includes Links 350, 351, 352, 370, 380, 460, 461, 462, 464, 466, 468, 470, 471, 473, 540, 571, 572, 580, 581, and 582 (also refer to the Alternative Routes map in the Map Volume accompanying the SWIP DEIS/DPA).

The Agency Preferred Alternative would require a proposed substation near Ely, Nevada, and a proposed substation near Delta, Utah. The proposed substation sites for the Ely to Delta segment include:

- Site 14 at the Intermountain Substation Siting Area near Delta, Utah

- Site 10 at the Robinson Summit Substation Siting Area near Ely, Nevada (same as above for the Midpoint to Dry Lake segment)

With some minor modifications the Agency Preferred Alternative route from the proposed substation in the Ely area to the proposed substation near Delta is the same as the 230kV Corridor Route described and analyzed on pages 2-56 through 2-58 in the SWIP DEIS/DPA. A localized modification was made to the 230kV Corridor Route in response to public comment received on the SWIP DEIS/DPA (refer to Sacramento Pass Mitigation Reroute in Chapter 3 of this document).

The Agency Preferred Alternative would utilize utility corridors in accordance with the direction in the BLM's House Range Resource Management Plan (RMP), the Warm Springs RMP, and the Schell Management Framework Plan (MFP). Because the 230kV Corridor Route and the Cutoff Route have similar environmental impacts (refer to environmentally preferred route discussion in Chapter 2 of the SWIP DEIS/DPA, and Table 1-2 and the Cumulative Effects section in Chapter 3 of this document) and this route best fulfills Federal Land Policy and Management Act's (FLPMA) mandate to consolidate corridors where possible, the BLM favors the 230kV Corridor Route as the agencies' preferred routing alternative. In addition, the 230kV Corridor Route is preferred environmentally because this route and substation would best minimize environmental impacts from the reasonably foreseeable future construction of the White Pine Power Project and from the interconnections with the 230kV transmission system in the Ely area. Refer to the Cumulative Effects section in Chapter 3 of this document for the discussion of "buildout" scenarios for the Ely area.

An existing microwave communication system may be used on the transmission line system between Ely, Nevada, and Delta, Utah.

The Ely to Delta segment is scheduled to begin commercial operation in 1998. Construction would begin in 1996.

Selecting the Proposed Plan

The Proposed Plan was selected by the BLM as the lead agency and the Forest Service, the National Park Service (NPS), the Bureau of Indian Affairs (BIA), and the Bureau of Reclamation as cooperating agencies. After reviewing the recommendations of the various District Managers, the Idaho State Director approved the Proposed Plan with consideration of several criteria:

- the issues and concerns identified during scoping and throughout the planning process
- oral comments received during formal public meetings and written comments received during the public review of the SWIP DEIS/DPA
- formal consultation and coordination with other agencies
- the results of the impact analysis of the Agency Preferred Alternative and other alternatives compared in the SWIP DEIS/DPA
- the decision criteria developed and considered by management, including 1) provide capacity for future utilities, 2) minimize new access roads needed for construction and operation, 3) public preferences expressed during the process, 4) avoid agricultural lands to the degree possible, 5) use existing utility and planning corridors, 6) minimize visual impacts, 7) minimize impacts to environmental resources (e.g., wildlife, cultural, and historical resources), 8) minimize conflicts with military airspace, and 9) allow for good transmission system reliability

The National Park Service does not agree with the Agency Preferred Alternative for the Ely to Delta segment. Because of visual impacts to Great Basin National Park and to visitors driving to the park, the National Park Service recommends rejection of the 230kV Corridor Route.

Process for Selecting the Environmentally Preferred Alternative

From the beginning of the environmental studies for the SWIP, a geographic information system (GIS) was used to help compile, organize, evaluate, and summarize environmental data. Opportunity and constraints analysis conducted using GIS during the regional environmental studies helped planners identify the alternative transmission line corridors in Phase I of the SWIP EIS process (refer to the SWIP Regional Environmental Report, April 1989).

In Phase II, a set of "assumed centerlines" for alternative routes were identified within the regional study corridors. These assumed centerlines were sited to avoid sensitive resource features and values identified during the regional environmental study and to respond to public concerns

identified during scoping. Interdisciplinary resource data were collected and input into GIS for a corridor from 1/2 to 3 miles (depending on the resource) on either side of these assumed centerlines for the detailed analysis reported in the SWIP DEIS/DPA.

Project planners used the GIS to perform impact assessment models developed to evaluate the following:

- the effects of ground disturbance during construction, operation, and maintenance
- potentially increased public accessibility into remote areas
- visual contrast of the project with the existing environment

These impact assessment models formed the basis for quantifying the potential effects of the construction and operation of the proposed 500kV transmission line. A total of 21 impact assessment models were developed to identify and document potential resource impacts.

The GIS was also used to assist planners in summarizing the environmental data during inventory and impact assessment/mitigation planning process. Data summaries and maps assisted resource specialists and project reviewers in identifying specific resources issues and potential impacts, as well as providing decision makers with the information for comparing routing alternatives.

Identifying Alternative Transmission Line Routes A network of over 140 individual routing segments or "links" were identified and studied in detail for the SWIP DEIS/DPA. The National Environmental Policy Act (NEPA) of 1969 requires that "reasonable and feasible" alternatives be compared in EIS/Pas. The number of possible routing alternatives that could be assembled from the numerous links would easily number in the hundreds, and would not be easy to compare in an EIS. Subsequently, it was necessary to determine environmental preferences for localized routing alternatives by what is termed the *subroute evaluation process*.

Each *subroute* is composed of individual links or combinations of several links that begin and end at common junction points in localized areas. A total of 25 subroute sets were evaluated (refer to Appendix D of the SWIP DEIS/DPA). The potential impacts of each subroute within a set were summarized from the detailed impact data of the five major resource disciplines: biological resources, earth resources, visual resources, land uses, and cultural resources. Project planners and resource specialists analyzed and compared the impact data and then ranked each subroute for environmental preference.

The links selected as the environmentally preferred subroutes narrowed down the number of possible link combinations, or routes, to a reasonable number to compare in an EIS. Links in areas where no other localized alternatives occurred, are termed "connectors". Connectors combined with the preferred link combinations of selected subroutes were used to assemble the alternative routes.

The environmentally preferred subroutes and their connectors were further evaluated in a GIS process that determined the path of least impact for each resource discipline (e.g., visual, biology, etc.). The GIS searched the environmental database containing the results of the impact assessment for a particular resource and tabulated the miles of impacts along the possible route segments searching for the route with the least significant impacts to that resource.

The identification of *resource preferred routes* for visual resources, biological resources, land use, earth resources, and cultural resources and the *subroute evaluation process* assisted project planners to assemble seven alternative routes on the Midpoint to Dry Lake segment and four alternative routes on the Ely to Delta segment for comparison in the SWIP DEIS/DPA.

Substation and Series Compensation Stations Substations, series compensation stations, and microwave communication facility sites were evaluated as part of the environmental studies for the alternative routes. Siting areas for substation and series compensation station facilities were inventoried by the same methods and for the same resource categories as the routing alternatives (study corridors).

Alternative sites were selected for substations and series compensation stations using environmental and engineering criteria and the GIS to generate opportunities and constraints mapping. Composite constraints and opportunity maps were analyzed to identify potential locations for facility sites where the potential for impacts would be minimized. Impacts were then assessed and mitigation planned for each alternative site (also refer to Appendix E of the SWIP DEIS/DPA).

A total of twenty (20) sites were compared for the construction and operation of the five proposed substations and series compensation stations. Selection of the environmentally preferred route was also considered during the final selection of the substation and series compensation station sites.

Microwave Communication Facilities Alternative microwave communication facility sites were identified through a review of existing developed microwave communication sites provided by the district offices of the BLM, and a review of other potential sites that met some or all of the following engineering and operational criteria: line of sight between sites (with a specified clearance), good access, available power source, 35 to 40 miles between sites, and a 1/4 acre of relatively flat ground. A total of 17 sites were identified.

Similar to the substation and series compensation station analysis, impacts for each of the alternative microwave communication facilities sites was assessed. A string of microwave communication facilities sites were then assembled into two (2) alternative microwave communication paths to facilitate the remote operation of the proposed substation and series compensation station sites (also refer to Appendix F of the SWIP DEIS/DPA). Selecting individual microwave communication facility sites included consideration of the engineering criteria described above (e.g., line-of-sight), as well as the potential environmental effects. The selection of the preferred microwave communications path depended on the final substation and series compensation station sites selected with the environmentally preferred route.

Selecting an Environmentally Preferred Route The seven alternative routes for the Midpoint to Dry Lake segment and the four alternative routes on the Ely to Delta segment were compared and the environmental, agency, and utility preferred route(s) for each segment were identified in the SWIP DEIS/DPA.

The environmentally preferred route was selected based on a comparison of the miles of potential impacts to resource features and values, and their significance nationally, regionally, and locally. Each alternative route was evaluated based on the following criteria to determine the environmentally preferred route:

- minimizes potential impacts to environmental resources (e.g., biological resources, visual resources, land use, earth resources, cultural resources)

- minimizes ground disturbance and an increased level of public access (e.g., miles of new access roads needed)
- ability to meet the purpose and need
- responds to public issues and concerns
- compliance with agency management plans (e.g., uses existing utility and planning corridors)

Considering these criteria, the environmentally preferred route was selected by evaluating and comparing each alternative route by: 1) the environmental resource data and miles of potential residual impacts (summarized in Tables 1-1 and 1-2 at the end of this chapter), and 2) evaluating cumulative effects associated with each alternative route.

Differences Between the Agency Preferred Alternative and the Environmentally Preferred Alternative

Midpoint to Dry Lake Segment

The Agency Preferred Alternative and the Environmentally Preferred Route (as described in the SWIP DEIS/DPA) for the Midpoint to Dry Lake segment of the SWIP are the same, with a few minor variations, and both are environmentally sound. Differences occur where the Agency Preferred Alternative considers the BLM's specific knowledge of localized situations. Difference occurs in the area of Jackpot, Nevada where Link 72 is environmentally preferred because it parallels the Midpoint-Valmy 345kV transmission line across Salmon Falls Creek, minimizing visual impacts to recreational users on the creek. The Agency Preferred Alternative would use Links 711 and 714 to reduce visual impacts by crossing Salmon Falls Creek at a narrower portion of the canyon roughly parallel and to the west of the existing 138kV transmission line. These links would also cross a smaller portion of the Salmon Falls Creek Special Recreation Management Area.

A second difference occurs in the vicinity of Contact, Nevada where Link 102 is environmentally preferred because it would parallel the Midpoint-Valmy 345kV transmission line reducing visual impacts associated with structure contrast and minimize visual impacts to residences in the Contact area. The Agency Preferred Alternative in this area utilizes Links 715 and 713 because the crossing of U.S. Highway 93 would better screen towers adjacent to the highway from the views of highway travelers. However, one tower on Link 713 would cause high visual impacts to views from a nearby residence.

A third difference occurs in the vicinity of the Winecup Ranch northeast of Wells, Nevada. Links 160, 161, 162, and 1612 are environmentally preferred because they would parallel the existing Upper Salmon to Wells 138kV transmission line (except Link 1612) which would reduce visual contrasts along U.S. Highway 93 and minimize potential predation impacts to sage grouse. The Agency Preferred Alternative would utilize Links 150 and 151 because they would minimize visual impacts to highway travelers (greater distance from the highway). Further, it would cross the California National Historic Trail near the Winecup Ranch minimizing visual impacts to the trail (due to existing visual contrasts of the ranch operations).

During the formal public meetings for the SWIP DEIS/DPA in Wells, Nevada on August 4, 1992, residents of Oasis opposed the preferred alternatives in the SWIP DEIS/DPA that would pass west of Oasis along the base of the Pequop Mountains (Link 211). Their opposition was based on

proposed development plans by Northern Holdings, Inc. and CSY Investments. Previously, Link 211 was preferred because it would be a less visually intrusive crossing of Interstate 80, a low visibility corridor designated by the Elko District of the BLM and managed under VRM Class II (refer to Visual Resources section in Chapter 3 and 4 of the SWIP DEIS/DPA). With the dark colors of the Pequop Mountains as a backdrop, Link 211 would result in weaker visual contrast to travelers on Interstate 80. Links 221 and 223 would better utilize the BLM utility planning corridor which follows the railroad corridor through the center of Goshute Valley.

In response to the public comments and the planned developments of CSY Development and Northern Holdings, Inc., the Agency Preferred Alternative through this area was revised to use Links 221 and 223 along the railroad corridor through the center of Goshute Valley. These links would completely avoid future potential conflicts with the planned developments for Northern Holdings properties and would minimize impacts to significant portions of the planned developments of CSY Investments. Cumulative effects have been identified for these foreseeable future actions (refer to the Cumulative Effects section in Chapter 3 of this document).

The last difference occurs at the Elko-White Pine county line. In this area, Links 250, 259, and 260 are environmentally preferred because they would avoid a known cultural site and cause fewer mile of moderate impacts to pronghorn antelope, long-billed curlew, and sandhill crane habitat. The Agency Preferred Alternative would use Links 241, 243, and 245 because they are within the BLM designated utility corridor in accordance with the Wells Resource Management Plan.

The Agency Preferred Alternative and the Environmentally Preferred Route are the same for the remainder of the Midpoint to Dry Lake segment of the SWIP.

Ely to Delta Segment

The Agency Preferred Alternative for the Ely to Delta segment of the SWIP is the 230kV Corridor Route and the least impact route is the Cutoff Route (as described in the DEIS/DPA). Links 350, 351, 352, 370, 380, 460, and 461 of the 230kV Corridor Route and Links 262, 263, 265, 266, 267, and 268 of the Cutoff Route have similar environmental impacts (refer to Environmentally Preferred Alternative in the SWIP DEIS/DPA and Table 1-2 at the end of this chapter - formerly Table 2-5 in the SWIP DEIS/DPA). The remainder of these routes (Links 462, 470, 540, 571, 572, 580, 581, and 582) in Utah are the same.

Because of the utilities future need to interconnect with the 230kV system in the Ely area, the potential cumulative environmental effects from the Cutoff Route would be more significant than the cumulative effects from the 230kV Corridor Route (refer to the Cumulative Effects section in Chapter 3 of this document). Therefore, because the 230kV Corridor Route would likely cause fewer future cumulative effects in the Ely area, this route is environmentally preferred (refer to Cumulative Effects in Chapter 3 of this document).

The Agency Preferred Alternative for the Ely to Delta segment of the SWIP is the 230kV Corridor Route (described in the SWIP DEIS/DPA) because the 230kV Corridor Route would parallel two existing 230kV transmission lines for its entire length. This route would best meet the mandate of Section 503 of FLPMA to utilize existing utility corridors where possible, and would utilize utility corridors in accordance with the BLM's House Range Resource Management Plan (RMP), the Warm Springs RMP, and the Schell Management Framework Plan (MFP).

Environmental concerns expressed by the public about the Cutoff Route include potential impacts to biological, cultural, land uses, and visual resources. Concerns about the 230kV Corridor Route include proximity to homes, health effects, land use conflicts, effects on property values, and visual impacts to views from Great Basin National Park. Although the Cutoff Route was found to have slightly fewer significant environmental effects, when cumulative effects are considered the 230kV Corridor Route would be environmentally preferred (refer to the Cumulative Effects section on page 3-12 in Chapter 3 of this document).

Comments received at the public meetings and comment letters on the SWIP DEIS/DPA generally expressed favor for the placement of new lines in existing utility corridors to minimize adverse impacts and to maintain open space values in previously undeveloped areas. The Cutoff Route was favored by some of the public because it would be located in more remote areas and would not be seen by tourists and visitors to Great Basin National Park.

Several letters were received on the SWIP DEIS/DPA expressing concerns about the crossing of private lands and crossing of the U.S. Highway 6/50 in the Sacramento Pass area by the 230kV Corridor Route. These comments led to identifying and studying several reroute alternatives to mitigate the potential impacts to agricultural uses and private lands, and to evaluate alternative crossings of the highway leading to Great Basin National Park (U.S. 6/50). Further, the Ely District of the BLM is developing a campground and recreation area in this area. Resource inventory data were collected for the three mitigation reroute alternatives during February 1993. These data were incorporated into the GIS database and impacts were assessed. The affected environment and environmental consequences of these mitigation reroute alternatives are described (including maps, tables, and photo simulations) under the Sacramento Pass Mitigation Reroute section in Chapter 3 of this document. Because Subroute 3 (Links 464, 466, 468, 471, and 473) would avoid crossing private lands and minimize visual impacts to views from U.S. Highway 6/50, it is the environmentally preferred mitigation reroute through the Sacramento Pass. The Agency Preferred Alternative is also the subroute using Links 464, 466, 468, 471, and 473. The remainder of the Agency Preferred Alternative for the Ely to Delta segment is same as the Environmentally Preferred Route described in the SWIP DEIS/DPA.

Consistency With Other Plans

There are no known inconsistencies or conflicts between the Proposed Plan and officially approved and adopted resource-related policies and programs of the BLM, the FS, the NPS, the BIA, the Bureau of Reclamation, other federal agencies, state and local governments, and Indian tribes. However, the NPS has stated its preference for the No-Action, the Cutoff Route, or the Direct Route on the Ely to Delta segment instead of the Agency Preferred Alternative (230kV Corridor Route) selected by the BLM and the other cooperating agencies. The NPS favors an action that would minimize or eliminate visual impacts to the Great Basin National Park.

Comparative Analysis

The No-Action alternative and approximately 2,000 miles of alternative corridors were studied in detail. To select environmental preferences, the environmental consequences of each alternative were summarized and compared, and agency and public comments were considered. The network

of routes was organized into the north-south alternatives from Midpoint to Dry Lake segment and the east-west alternatives from Ely to Delta segment. Nine routing options were compared for the Midpoint to Dry Lake segment, and four alternatives were evaluated on the Ely to Delta segment. The final alternatives are illustrated in the Map Volume accompanying the SWIP DEIS/DPA, in Figure 1-1 of this document, and are described as follows:

Midpoint to Dry Lake Segment

- **Route A** - 345kV*-Thousand Springs-Goshute Valley-Steptoe-Egan Range-Dry Lake Alternative
- **Route B** - 345kV*-Trout Creek-Wendover-Steptoe-Antone Pass-Dry Lake Alternative
- **Route C** - 345kV*-Trout Creek-Goshute Valley-Steptoe-Egan Range-Dry Lake Alternative
- **Route D** - 345kV*-Wells-Steptoe-Egan Range-Dry Lake Alternative
- **Route E** - 345kV*-Thousand Springs-Wendover-Steptoe-Egan Range-Dry Lake Alternative
- **Route F** - Hagerman-Trout Creek-Goshute Valley-Egan Range-Dry Lake Alternative
- **Route G** - 345kV*-Cottonwood Creek-Thousand Springs-Goshute Valley-Steptoe-Egan Range-Dry Lake Alternative
- **Utility Preferred Route**
- **Agency Preferred Alternative**

(* - 345kV refers to the SWIP alternative being parallel to the Midpoint to Valmy 345kV transmission line)

In addition, sixteen alternative substation sites in seven substation siting areas were evaluated and compared for the four proposed substations and series compensation stations the Midpoint to Dry Lake segment (including five sites in the Ely area that were also evaluated for the Ely to Delta segment), and two microwave communication paths (17 sites) were evaluated and compared.

Ely to Delta Segment

- **Delta Direct Route**
- **Cutoff Route**
- **230kV Corridor Route**
- **Southern Route**

In addition, nine alternative substation sites in six substation siting areas were evaluated and compared for the two proposed substations for the Ely to Delta segment (including five sites in the Ely area that were also evaluated for the Midpoint to Dry Lake segment).

Public Issues and Management Concerns

To aid the federal agencies' decision-making process, and to help evaluate the significance of changes in the various RMPs and MFPs for the BLM Districts and Resource Areas and the Forest Land and Resource Management Plan for the Humboldt National Forest, the following public issues and management concerns identified during the public scoping process and in the public meetings and workshops have been analyzed in the following section.

Issue 1 - Need for Project

The IPCo has proposed to construct, operate, and maintain a 500kV transmission facility from the existing Midpoint Substation near Shoshone, Idaho to a proposed substation near Dry Lake (northeast of Las Vegas, Nevada) and from Ely, Nevada to Delta, Utah to:

- provide seasonal exchanges between the Northwest and the Southwest
- increase the reliability and capacity of the transmission system in the western U.S.
- increase competition and economic efficiency by increasing transmission access
- allow for mutually beneficial transactions to northwest and southwest utilities at an open marketplace
- increase wheeling capacity for other utilities
- furnish access to the economy energy market
- provide access to long-term purchases and sales
- diversify fuel resources used to generate electrical power
- contribute to the reliability of the UNTP Phase I (the Delta to Marketplace line)
- allow for the bidirectional transfer of bulk power bought, sold, and/or exchanged in the marketplace between utilities in Utah, southern Nevada, and Idaho
- create a bidirectional transfer path between the Pacific Northwest and the intermountain regions of the West
- create a bidirectional transfer path between the intermountain region and southern Nevada

The public has expressed concern about the need for the SWIP. The public questioned the rationale for new construction, the demand for additional generating facilities, and the long-term demand and need. There was significant concern for utilities to consider utilizing alternative generating resources such as geothermal and solar. An expanded purpose and need for the SWIP is found in Chapter 3 of this document.

Issue 2 - Maximize Use of Public Lands

One of the major public comments was utilizing public lands for routing the transmission line since the line would offer no direct benefit to private landowners and would also interfere with agricultural operations. Within the project study area (i.e., study corridors) the land ownership is split between federal (BLM 79 percent and FS 11 percent), state (2 percent), and private (8 percent), approximately. In response to this issue the route selection process attempted to locate the line on public lands to the degree possible within environmental and engineering constraints. Where there was a choice of crossing public or private land, the private land was avoided.

Issue 3 - Minimize Visual Impacts

The scenic resources of the southern Idaho, eastern Nevada, and west central Utah are unique in many respects, largely because of the predominance of the north-south trending mountain ridges and large undeveloped valley expanses. The study area is characterized by relatively open, uninterrupted views with minimal overstory vegetation cover. Land ownership is predominantly BLM with the remaining lands divided between private, state, and national forest. The federal agencies have management policies to protect their lands from unnecessary degradation of scenic resources. State and private lands have no specific policies regarding visual resources protection. Significant concern has been expressed by the agencies and the public over the views from the parks, recreation ares, residences, preservation areas, highways, scenic routes, and sensitive cultural sites, and impacts affecting the scenic value of the landscape.

The NPS is concerned about potential visual impacts from the Great Basin National Park's (GBNP) key viewpoints (e.g., scenic overlook points, the visitor center, etc.), visual impacts to highway travelers approaching the park's entrance, and to the interpretive facilities proposed in GBNP's Final General Management Plan/Development Concept Plans/EIS to be located in the basins outside of the park's boundaries. Also the NPS is concerned about the visual integrity of the basins surrounding the park.

Issue 4 - Minimize Impacts to Biological Resources

A total of eleven vegetation communities were identified within the SWIP study corridors with 73 plant species identified as sensitive on the state and/or federal level. Also within the project area, there are 560 species of vertebrates, 111 species of mammals, 15 species of amphibians, and 70 species of fish.

The region contains excellent habitat for big game, including mule deer, elk, and pronghorn. A number of sensitive raptors occur near or within the study area, including ferruginous hawk, bald eagle, and peregrine falcon. Numerous other raptors also nest in the region.

Throughout northeastern Nevada sage grouse are an important upland game species. There is concern that raptors perching in transmission towers would prey on the sage grouse during their spring breeding period.

The desert tortoise in southern Nevada was recently listed as a threatened species by the United States Department of Interior-Fish & Wildlife Service (FWS). The concern for constructing a transmission line through sensitive habitats is that ground disturbing activities (e.g., road building) during construction could destroy habitat. Also, there is a concern that any roads kept open through these areas could lead to tortoise being destroyed by off-highway vehicles.

Some riparian habitats occur within the region and are highly sensitive because of their very limited occurrence and very high value as wildlife and rare plant habitat.

Wetlands and aquatic habitats, like riparian habitats, are generally associated with the springs and mountain drainages in the region. These aquatic and wetland habitats are important because of their position in a notably arid portion of the United States, and because of the habitat they provide to numerous animal and plant species, some of which are listed among the threatened, endangered, or otherwise sensitive biota of the United States and the states of Idaho, Nevada, and Utah.

The planning process, described in the SWIP DEIS/DPA, responded to the issue by avoiding the most sensitive areas to the degree possible on all routing alternatives. Surveys would be conducted during preparation of the Construction, Operation, and Maintenance Plan to help minimize adverse impacts.

Issue 5 - Minimize Impacts to Cultural Resources

The project area has been occupied for thousands of years, and contains a long history of human use. Thousands of cultural sites have been recorded, but only a few have been formally inventoried. Many of these sites are low to moderate sensitivity resources. With the exception of the agricultural areas along the Snake River plain, the project area remains largely rural. All major known cultural resources were avoided, where possible, during alternative route selection as described in the SWIP DEIS/DPA. Compliance with Section 106 of the National Historic Preservation Act would be done to mitigate adverse effects to cultural resources.

Issue 6 - Health and Safety

Concerns have been expressed about the potential health impacts that electromagnetic fields (EMFs), as well as shock hazards.

In recent years there has been growing public concern over the possible effects that EMFs could have on human health. Because EMF research is inconclusive and sometimes contradictory,

definitive answers are still years away. The IPCo attempts to site facilities in areas that avoid or minimize human exposure to EMF. This policy tends to minimize visual impacts as well.

The IPCo would also provide grounding to reduce the potential of shock hazard. The National Electric Safety Code requires grounding "...as one of the means of safeguarding employees and the public from injury that may be caused by electric potential."

Issue 7 - Wilderness Areas/Wilderness Study Areas (WSAs)

A wilderness area and many WSAs are found in or near the study corridors for the SWIP. The agencies and the public are concerned about the presence of the transmission line on lands adjacent to WSAs potentially affecting the designation of the area as wilderness.

Issue 8 - Minimize Land Use Impacts

A transmission line which directly impedes an area's current or planned use constitutes a land use impact. Land uses found throughout the study area include ranch headquarters, agricultural operations, and planned development. The study corridors for the alternatives crossing through southern Idaho pass through large areas of irrigated agricultural lands. There was also concern by both Hill Air Force Base (AFB) and Nellis AFB for their military operating areas (MOAs), low-flight areas where the Air Force does training and testing. The Direct Route on the Ely to Delta segment also crosses through the R-6405 Restricted Air Space area on the Utah Training and Testing Range (UTTR) for Hill AFB.

Many recreational areas (e.g., trails, scenic byways, special recreation management areas, parks, etc.) are also located in or adjacent to the study corridors for the various alternatives. Great Basin National Park is one of the nation's newest national parks, and is Nevada's only national park.

Issue 9 - Use Existing Transmission Line Corridors

Both the public and the agencies expressed a desire to locate the transmission line along existing transmission corridors, wherever possible, to minimize environmental impacts. One way is to maximize the miles that the transmission line would parallel existing transmission lines or other linear utilities. Several of the alternative routes paralleled existing transmission facilities to the extent possible.

The public and the agencies were also concerned about minimizing the miles of transmission line outside of designated or planning corridors wherever possible. The alternative routes were sited to the degree possible using these corridor designations from agency management plans.

Issue 10 - Property Values and Compensation

Private property owners expressed a concern for a decrease in the monetary value of their property as a result of the proposed transmission line and whether or not they would receive adequate compensation for property loss. Transmission lines potentially affect existing or future property values, through there is no conclusive evidence to suggest this. Landowners would be compensated, based on fair market value of the land, for an easement or purchase of their land. There are some differences, although none considered substantial, between the effects to private property owners for the various alternative routes.

Issue 11 - Effects on Agency Land Management Plans

The BLM plans and designates corridors for linear utility use. However, it does not presently recognize a corridor for much of the Agency Preferred Alternative that has been evaluated, along with the other alternatives, in the SWIP DEIS/DPA and this document. Included in the Environmental Impact Statement and plan amendment process is a determination of what public lands, if any, should be designated as a utility corridor. The end results would be amended agency plan(s) to allow for a utility corridor and the right-of-way for the SWIP. This issue developed when the IPCo filed an application for a right-of-way grant. As part of this plan amendment process, the BLM, the FS, and the other cooperating agencies involved the public, other federal agencies, and state and local governments.

Affected Environment

Three primary environmental systems were examined:

- the natural environment - air, soils, geology, mineral resources, wildlife, and botanical resources
- the human environment - land uses, visual resources, socioeconomics, electrical effects
- the cultural environment - archaeological, historic, and Native American resources

The inventory results established the baseline for the No-Action alternative. Following identification of the preliminary corridor locations, a study area (study corridors) was then defined for the various resource investigations.

The climate of eastern Nevada, southern Idaho, and western Utah is influenced largely by location, regional weather systems, and topographic orientation. The climate throughout much of this area is characterized by hot, dry summers followed by cold, dry winters. Surface winds are channeled through valleys between generally north-south trending mountain ranges. Winds flow predominately in northeasterly or southwesterly directions. Annual precipitation depends largely on elevation. Precipitation occurs primarily in the form of snow at higher elevations during the winter months. The snows maintain high water tables and provide groundwater recharge. Some additional precipitation occurs from thunderstorms produced by daytime heating of air masses in valleys.

Northern segments of the SWIP, within southern Idaho and northeastern Nevada, are in the Snake River Plain section of the Columbia Plateau physiographic province. This section is a vast, relatively flat plain and young lava plateau, which is deeply dissected by the canyons of the Snake River and Salmon Falls Creek, the dominant landscape features within this area. Irrigated agricultural lands, this area's main land use, are found clustered north and south along the Snake River.

To the south, on the Snake River Plain, agricultural areas extend to bordering foothills and mountains in a transitional landscape between the Basin and Range and Columbia Plateau provinces. This transitional landscape includes foothills, plateaus, mesas, and buttes formed of eroded lava and sedimentary rock layers.

The majority of northeastern and southern Nevada and western Utah, falls within the Basin and Range physiographic provinces. Topographically, this landscape is distinguished by isolated, roughly parallel mountain ranges separated by closed (undrained) desert basins or playas. The mountain ranges often run 50 to 75 miles in length and are generally north-south trending. Surrounding the base of the mountains and extending into the basins, there are often distinctive alluvial areas.

Portions of western Utah also include a transition zone of the Basin and Range province into what is locally referred to as the "West Desert" landscape. This landscape includes portions of the Sevier Desert and Sevier Lake. The topography within this area is extremely flat and includes large playas or mud flat areas, that exhibit little landform diversity. Again, these areas are divided by rugged, rocky mountain ranges.

Earth resource features that have a high sensitivity are landslide hazard areas, areas of high paleontological sensitivity, soils with either a high wind erosion or high water erosion hazard, areas of active mining, perennial streams and lakes, springs, and wetland areas. Significant paleontological resources are found at the Hagerman Fossil Beds National Monument near Hagerman, Idaho.

Eleven vegetative communities have been identified in the SWIP study corridors, including shadscale, greasewood, samphire-iodine bush, Great Basin sagebrush, Mojave desert scrub, grassland, wetlands, riparian areas, piñon-juniper, alpine tundra, limber/bristlecone pine, and quaking aspen. These vegetation types support a large variety of mammals, birds, amphibians, and reptiles.

Approximately 560 species of vertebrates are likely to occur, over the course of a year in habitats traversed by the alternative routes.

Seventy species of fish are known to occur within aquatic habitats within the study corridors. Native and introduced game fish are present in warm and cold water lakes, ponds, and reservoirs, and in perennial streams and rivers. Others inhabit hot and cold springs and marshes. Approximately 31 percent of the fish fauna occupying waters within the study corridors are introduced.

Fifteen species of amphibians are expected to occur in aquatic, riparian, and wetland habitats in the study corridors. Sixty-two species of reptiles potentially occur in terrestrial habitats within study corridors.

A total of 111 species of mammals are expected to occur within habitats traversed by alternative routes. Small mammals including rodents, lagomorphs (rabbits and hares), bats, and shrews are the most numerous, although not readily observed. Over one half of the mammals that may occur within the study corridors are rodents (51 species). Large mammals include 19 species of carnivores (e.g., lynx, wolverine, etc.) and five species of native ungulates (e.g., antelope, mule deer, bighorn sheep).

Free roaming horses (*Equus caballus*) and burros (*E. asinus*) occur on public lands in the study corridors. These animals are descendants of horses and burros that escaped from man or were turned out onto the open range.

In recent years, dramatic declines in desert tortoise population numbers have been observed throughout much of its range, including southern Nevada. A number of factors have contributed to the observed decline, including loss of habitat to development, degradation of habitat from livestock grazing, disease, predation on juveniles by ravens attracted to areas where human refuse accumulates, illegal collection, and off-road vehicle (ORV) use. The Mojave population of the desert tortoise was formally listed as a federally threatened species by the FWS in April 1990. Concern has been expressed for the maintenance of viable populations in Clark County, Nevada, and especially the Las Vegas Valley where rapid commercial and residential development is occurring.

Declines in sage grouse numbers are largely associated with destruction of sagebrush habitat. Conversion of sagebrush to agricultural lands, and attempts to convert sagebrush areas to grassland for livestock grazing are a few of the human developments contributing to the decrease in grouse numbers.

The majority of the lands crossed by the alternative routes are used for cattle grazing and are classified as rangeland. Other significant uses within the study corridors include agriculture, mining, airports and airstrips, utilities, commercial, governmental and other industrial facilities. Residences near urban areas and in remote locations, both occupied and unoccupied are located within the study corridors. Principal urban areas or residential concentrations in or near the study corridors include:

- Hagerman, Eden, and Hansen in Idaho
- Wells, Ely, Curry, Jackpot, Oasis, Baker, and McGill in Nevada
- Delta, Eskdale, and Hinckley in Utah

Several of the alternative routes in Utah and Nevada could potentially affect military aircraft operations at Hill Air Force Base in Utah and Nellis Air Force Base in southern Nevada.

Approximately half of the lands crossed by the study corridors in Idaho fall into the category of agriculture. The high-desert lands of the Snake River Valley are fertile and productive when irrigated. Many of the lands crossed in Idaho are classified as prime or important farmland by the Soil Conservation Service (SCS).

Dispersed recreation occurs throughout these areas in Nevada, Idaho, and Utah. Developed campsites and recreation areas are usually located along perennial streams or reservoirs. Great Basin National Park, near Baker, Nevada, is passed by several of the alternative Ely to Delta segment routes. Several WSAs inventoried within the study corridors include portions of Salmon Falls Creek WSA in Idaho and fourteen WSAs in Nevada including South Pequop, Bluebell, Goshute Peak, Goshute Canyon, Marble Canyon, Mount Grafton, Fortification Range, Delamar

Mountains, Evergreen, Meadow Valley Mountains, Fish and Wildlife 1, 2 & 3, and Arrow Canyon. WSAs within Utah include Howell Peak, King Top, Notch Peak, Fish Springs, Wah Wah Mountains, and Swasey Mountain. The boundary of the Mt. Moriah Wilderness area is also within the study corridors of one of the Ely to Delta segment alternative routes.

Cultural resources are historic and traditional cultural properties that reflect our nation's heritage. Federal regulations define such historic properties to include prehistoric and historic sites, buildings, structures, districts, and objects included in, or eligible for inclusion in the National Register of Historic Places (NRHP), as well as artifacts, records, and remains related to such properties. These regions of Nevada, Idaho, and Utah have been occupied for thousands of years. This section briefly summarizes what is known about this long history of human use of the region. More details are provided in the SWIP DEIS/DPA, in this document, and in the technical reports (Rogge 1991).

Prehistory - The project area overlaps portions of two culture areas, the Great Basin and the Colorado Plateau, but the vast majority of the project area is within the "cultural," if not the geographic, Great Basin. The extreme southern portion is along the western margin of the Colorado Plateau. Within the study area three prehistoric cultural stages, Paleo-Indian, Archaic, and Formative are represented and local phases or variations within each stage have been defined.

Ethnohistory - During the ethnohistoric era, these regions of Nevada, Idaho, and Utah were occupied by the Northern Shoshone, Bannock, Western Shoshone, Pahvant Ute, and Southern Paiute. Generally speaking, the Northern Shoshone and Bannock inhabited the study corridors in southern Idaho. The Western Shoshone ranged through eastern Nevada and northwestern Utah. The central portion of Utah was occupied by the Pahvant Ute while the Southern Paiute inhabited southwestern Utah and southern Nevada.

History - After the arrival of Europeans in the New World, portions of the study corridors were claimed by Spain, Great Britain, France, Mexico, and Canada, as well as the United States. The earliest European exploration was led by Escalante who skirted the eastern margin of the study area in Utah. After the famous Lewis and Clark Expedition to the Pacific Coast in 1804-1806, fur trappers and mountain men were lured to the Rocky Mountains until the decline of fur trading in about 1840.

Environmental Consequences

Environmental consequences from the Agency Preferred Alternative would be the residual impacts remaining after mitigating measures have been applied to initial (unmitigated) impacts. The process involved assessing impacts based on a comparison of the proposed project with the pre-project environment, determining mitigation that would reduce or eliminate impacts, and identifying residual impacts.

Additions and changes made to Tables 2-4 and 2-5 summarizing and comparing impacts in the SWIP DEIS/DPA was updated and reprinted in this document (refer to Tables 1-1 and 1-2). The majority of the changes to these tables occur in the Military Operating Areas, the Wildlife Section, and Visual Resources.

The consequences, or impacts, to the environment caused by implementing the proposed project were assessed by considering the existing condition of the environment and the effects of the

activities of the proposed project (construction, operation, and maintenance) on the environment. The "initial" impacts were evaluated to determine if mitigation measures would be effective in lessening the impacts. Those impacts remaining after mitigation measures were applied are referred to as "residual" impacts. Many of the identified impacts are considered to be adverse, direct, and long-term. Some impacts (e.g., visual, some cultural and biological impacts) are considered adverse, indirect, and long-term.

The principal type of impacts associated with earth resources is the potential for increased erosion hazards. Some short-term soil compaction impacts could occur in agricultural areas. Some stream sedimentation could also occur at the crossings of perennial streams.

Typical impacts to biological resources include effects on threatened, endangered, or protected species, rare or unique vegetation types, migration corridors for wildlife, areas of low revegetation potential, or highly productive wildlife habitat. The impacts would be generally associated with the removal of vegetation and habitat caused by construction and operation activities, and from human activity from more access into remote areas. The presence of the transmission towers would increase the potential for long-term predation of sage grouse by golden eagles on adult and immature birds. Adding towers also would provide roost/hunting sites for ravens and magpies, thus increasing the long-term potential for predation on grouse nests. No wetlands or riparian areas would be expected to be impacted.

Land use impacts include those that would displace, alter, or otherwise physically affect any existing or planned residential, commercial, or industrial use or activity, any agricultural use, or any recreational, preservation, educational, or scientific facility or use. Few land use impacts would occur from the construction of the SWIP, although the impacts that would occur would be long-term.

Potential socioeconomic effects could include construction-period impacts to area communities, social and economic impacts along the selected route, and fiscal impacts on local jurisdictions. These effects could be both adverse and beneficial.

Visual impacts are considered adverse, in-direct, and long-term. They include effects to the quality of any scenic resource, the view from any residential or other sensitive land use or travel route, or the view from any recreation, preservation, education, or scientific facility. Potential visual impacts to existing and proposed sensitive viewpoints for GBNP are a concern. Other visual impacts would be generally associated with residential concentrations or dispersed homes, scenic roads and highways, and recreation viewpoints, including wilderness areas and WSAs.

Direct, adverse physical impacts could occur to cultural resources during construction, while indirect impacts could result after construction due to increased erosion or increased public access to sites along the transmission line right-of-way. Adverse visual effects may occur to sites with high aesthetic or interpretive values.

Potential electrical, biological, and health and safety effects from the Agency Preferred Alternative were assessed. These include corona effects, electric and magnetic field effects, and effects on cardiac pacemakers, agriculture, and public safety.

The Stateline Resource Area has released its DEIS/RMP which, when finalized, would designate utility corridors. The RMP corridor studies and the SWIP EIS studies have been coordinated, and

the Agency Preferred Alternatives are similar. FLPMA of 1976 mandates to the extent practical that the BLM consolidate future utility projects within the corridor that is established.

Committed mitigation measures for the Agency Preferred Alternative are listed by milepost in Appendix D and summarized in Tables 1-3 and 1-4 in this document. Table 1-5 describes these selectively committed mitigation measures. Table 1-6 describes generically committed mitigation measures that will be applied throughout the project.

Cumulative Effects

The potential future "buildout" in the Ely area (i.e., interconnection with the 230kV system and the White Pine Power Project) are described in the Cumulative Effects section in Chapter 3 of this document.

Throughout sections of the Agency Preferred Alternative several transmission lines would be paralleled. From Midpoint Substation to south of Contact, Nevada the Agency Preferred Alternative route would parallel the Midpoint to Valmy 345kV transmission line a point about ten miles south of Contact. From a point just north of the Idaho-Nevada state line, the Upper Salmon to Wells 138kV line would be paralleled by the Agency Preferred Alternative to the same point south of Contact. The Agency Preferred Alternative would also parallel the Lincoln County 69kV line and the UNTP for 88.5 miles from the Delamar Valley northwest of Caliente, Nevada to the Hidden Valley northeast of Las Vegas, although it would be separated from the UNTP by a mile or more along U.S. Highway 93 south of Pahranagat Wash. The UNTP would terminate at the proposed marketplace substation south of Boulder City, Nevada.

The SWIP's southern connection to the proposed Dry Lake Substation would require an interconnection with the proposed marketplace substation. The Notice to Proceed for the construction of the SWIP, from Ely to Dry Lake, would be contingent on the approval of a transmission facility between the Dry Lake Substation and the proposed marketplace substation. The Marketplace-Allen Transmission Project (MAT) has been proposed by Nevada Power Company to meet this and other interconnection needs.

The SWIP may be built in phases if market or financial conditions warrant. The portion of the SWIP from Midpoint Substation to Ely (Midpoint to Dry Lake segment) may be the first phase developed.

Also refer to the Cumulative Effects section in Chapter 3 of this document and Chapter 4 of the SWIP DEIS/DPA.

Issue Comparison by Alternative

Issue 1 - Need for Project

If successful, the IPCo, along with other participants, intends to construct the SWIP from Midpoint to Dry Lake to satisfy its need to meet regional utility responsibilities to provide adequate supplies

of reliable and economical electricity to the western system electrical customers. The proposed project would allow for power exchanges from the Southwest to the Northwest, increase the reliability and capacity of the transmission system in the western U.S., increase competition and economic efficiency by increasing transmission access, create open marketplace substations, and other benefits. All routing alternatives would serve the project's purpose and need. The No-Action alternative would not satisfy the purpose and need.

If successful, the IPCo is proposing that BLM transfer the Ely to Delta segment of the SWIP right-of-way grant to the LADWP on behalf of the UNTP participants for construction, operation, and maintenance. The Ely to Delta segment would allow the LADWP and their participants to satisfy their need to meet regional utility responsibilities to provide adequate supplies of reliable and economical electricity to their electrical customers. The proposed project would create a bi-directional transfer path between the Northwest and the intermountain regions of the West, create a bi-directional transfer path between the intermountain region and southern Nevada, contribute to reliability of the UNTP and the SWIP Midpoint to Dry Lake line, and allow for the bi-directional transfer of bulk power bought, sold, and/or exchanged in the marketplace between utilities in Utah, Nevada, and Idaho.

The SWIP would conform to the utilities' efforts to perform least cost planning:

- consider conservation equally with other resource options to achieve lowest cost to electrical consumers
- contribute to adding competition in the generation marketplace
- contribute to efforts to establish values for air emissions from power plants

The SWIP would allow diversity of supplies and markets to merge together to maximize cost economies:

- diversity of area and use - reducing the amount of generation required
- market diversity - access to the transmission grid to all suppliers of generation and conservation should drive down the cost of future resource options
- fuel and supply diversity - enhance environmental mitigation between regions

Electrical utilities are responsible for providing adequate supplies of reliable, economic electricity to their customers. The present load growth in the western U.S., coupled with the expense and difficulties of building new generating facilities, reinforces the need to provide for inter-regional transfer of energy.

Issue 2 - Maximize Use of Public Lands

The following table shows the land ownership/jurisdiction in miles crossed for each routing alternative. Alternatives were also ranked from the least miles of private land crossed to the most miles of private land crossed:

LAND JURISDICTION - MIDPOINT TO DRY LAKE
(miles)

Route	Federal	State	Private
A	413.0	5.2	95.2
B	414.1	5.2	97.3
C	397.6	5.2	104.6
D	410.1	5.2	98.7
E	430.5	5.2	88.5
F	406.1	2.3	115.6
G	415.0	5.2	85.3
Agency Preferred Alternative	406.5	5.2	83.1

LAND JURISDICTION - ELY TO DELTA SEGMENT
(miles)

Route	Federal	State	Private
Direct	125.7	7.2	0.0
Cutoff	143.4	10.5	0.0
230kV*	133.5	10.4	10.2
Southern	197.4	12.0	1.6

* The 230kV Corridor Route is the Agency Preferred Alternative for the Ely to Delta segment.

The Midpoint to Dry Lake alternative routes rank as follows: (1) Agency Preferred Alternative (2) Route G, (3) Route E, (4) Route A, (5) Route B, (6) Route C, (7) Route D, (8) Route F. The Ely to Delta segment alternative routes rank as follows: (1) Direct Route and Cutoff Route, (2) Southern Route, (3) 230kV Corridor Route (Agency Preferred Alternative).

Issue 3 - Visual Impacts

The following table summarizes the Visual Resource Management Class II landscapes crossed, scenic quality class A landscapes crossed, and miles of routes visible within one mile of a residence.

VISUAL RESOURCE SUMMARY - MIDPOINT TO DRY LAKE
(miles crossed)

Route	VRM Class II	Scenic Quality A	Miles of Route Visible From Residences within 1 Mile	Residences within 1 Mile
A	7.3	0.9	65.7	83
B	17.8	0.9	52.3	78
C	5.6	0.9	57.1	80
D	10.0	0.9	61.9	83
E	19.5	0.9	64.1	83
F	7.5	5.0	56.9	94
G	8.1	0.5	59.9	93
Agency Preferred Alternative	6.7	0.5	63.1	96

VISUAL RESOURCE SUMMARY - ELY TO DELTA SEGMENT
(miles crossed)

Route	VRM Class II	Scenic Quality A	Miles of Route Visible From Residences within 1 Mile	Residences within 1 Mile
Direct	0.0	0.0	3.3	2
Cutoff	0.0	4.2	5.1	3
230kV*	0.0	4.2	23.9	26
Southern	2.0	0.0	4.8	7

* The 230kV Corridor Route is the Agency Preferred Alternative for the Ely to Delta segment.

Review by the BLM and the FS has found changes to visual management objectives to be acceptable as a result of the project. Detailed definitions of the visual management classes, locations and extent of management class changes, and location and extent of visual impacts to viewers and to scenic resources are found in the Technical Report (refer to Appendix H of the SWIP DEIS/DPA for locations where this document can be reviewed).

The ranking of alternatives is relative. All alternatives would have some adverse effect on the scenic resource. The Midpoint to Dry Lake segment alternative routes rank as follows: (1) Routes A, D, and E, (2) Routes B, C, G, and Agency Preferred Alternative, (3) Route F. The Ely to Delta

segment alternatives routes rank as follows: Direct Route, Cutoff Route, Southern Route, 230kV Corridor Route (Agency Preferred Alternative).

Issue 4 - Minimize Impacts to Biological Resources

The following table describes the extent of occurrence of special-status species and riparian crossing for each alternative:

SENSITIVE BIOLOGICAL SPECIES - MIDPOINT TO DRY LAKE
(miles)

Route	Desert Tortoise	Bald Eagle	Peregrine Falcon	Ferruginous Hawk	Sage Grouse	Riparian
A	52.1	15.3	0.0	1.3	35.2	3.2
B	52.1	32.8	23.1	1.4	36.8	3.2
C	52.1	16.3	0.0	1.3	30.7	3.7
D	52.1	5.8	0.0	1.3	34.1	5.3
E	52.1	18.2	23.0	1.3	36.3	3.3
F	52.1	16.3	0.0	1.3	32.8	3.8
G	52.1	19.6	0.0	1.4	40.6	4.8
Agency Preferred Alternative	52.1	6.0	0.0	1.3	37.2	5.1

SENSITIVE BIOLOGICAL SPECIES - ELY TO DELTA SEGMENT
(miles)

Route	Desert Tortoise	Bald Eagle	Peregrine Falcon	Ferruginous Hawk	Sage Grouse	Riparian
Direct	0.0	7.0	0.0	0.0	7.9	1.6
Cutoff	0.0	8.4	0.0	0.0	6.8	1.2
230kV*	0.0	17.8	0.0	4.5	7.1	0.9
Southern	0.0	0.0	0.0	10.1	11.8	0.1

* The 230kV Corridor Route is the Agency Preferred Alternative for the Ely to Delta segment.

Alternatives when ranked from the least miles of impact to the most miles of impact are as follows: The Midpoint to Dry Lake alternative routes rank as follows: (1) Routes A and D, (2) Routes E and F, (3) Route C, (4) Agency Preferred Alternative, (5) Route C, (6) Routes B and G. The Ely to Delta segment alternatives routes rank as follows: (1) 230kV Corridor Route (Agency Preferred Alternative), (2) Cutoff Route and Direct Route, (3) Southern Route. The No-Action would result in no impacts to biological resources.

Issue 5 - Minimize Impacts to Cultural Resources

The following table summarizes archaeological, historical, and Native American resources sensitivity for each routing alternative.

CULTURAL RESOURCES - MIDPOINT TO DRY LAKE
(occurrences and miles)

Route	Historic Sites w/in 1 mile	Ethnohistoric Sites w/in 1 mile	Prehistoric Sites w/in 1 mile	Predicted High Sensitivity Zone
A	53	13	388	18.4
B	46	16	413	19.3
C	50	14	408	17.2
D	68	12	430	20.5
E	46	15	386	18.4
F	54	16	510	11.0
G	61	14	399	20.6
Agency Preferred Alternative	53	14	388	18.4

CULTURAL RESOURCES - ELY TO DELTA SEGMENT
(occurrences and miles)

Route	Historic Sites w/in 1 mile	Ethnohistoric Sites w/in 1 mile	Prehistoric Sites w/in 1 mile	Predicted High Sensitivity Zone
Direct	4	8	21	0.8
Cutoff	5	8	26	0.8
230kV*	12	8	80	8.0
Southern	8	10	66	6.0

* The 230kV Corridor Route is the Agency Preferred Alternative for the Ely to Delta segment.

Alternatives when ranked from the least miles of potential high and moderate impact to the most potential miles of high and moderate impacts are as follows for the Midpoint to Dry Lake segment: (1) Route C, (2) Agency Preferred Alternative, (3) Routes D and A, (4) Routes B, E, and G, (5) Route F. The Ely to Delta segment alternatives routes rank as follows: (1) Direct Route, (2) Cutoff Route, (3) 230kV Corridor Route (Agency Preferred Alternative), (4) Southern Route. The No-Action would result in no impacts to cultural resources.

Issue 6 - Health and Safety

Electromagnetic field (EMF) is an especially difficult issue and conclusive results may not be known for years. The many studies that have been conducted on EMF demonstrate that we are all affected by everyday life. Electromagnetic fields exist from microwaves, lights, waterbed heaters,

hair dryers, etc. The right-of-way width of 200 feet is intended to minimize these effects. Outside of the right-of-way the field levels would be expected to be no higher than normally occur in household appliances. There is no substantial difference between any of the routing alternatives. The No-Action alternative would have no EMF effects.

Safety would be a primary concern in the design of the SWIP. An alternating current (AC) transmission line would be protected with power circuit breakers and related line relay protection equipment. If conductor failure occurs, power would be automatically removed from the line. Lightning protection would be provided by overhead ground wires along the line. Electrical equipment and fencing at the substation would be grounded. All fences, metal gates, pipelines, etc. that cross or would be within the transmission line right-of-way would be grounded to prevent electrical shock. If applicable, grounding outside of the right-of-way may also occur. There is no substantial difference between any of the routing alternatives. The No-Action alternative would have no safety concerns.

Issue 7 - Wilderness Areas/Wilderness Study Areas (WSAs)

No significant and direct adverse effects were identified to any recreational resource, although indirect visual impacts were documented. No wilderness areas or WSAs would be crossed by the Agency Preferred Alternative, although there would be visual impacts from dispersed locations along the boundaries of several areas.

WILDERNESS AREAS/WILDERNESS STUDY AREAS - MIDPOINT TO DRY LAKE
(areas passed and miles)

Route	Wildernesses passed	WSAs passed	<1/4 mi.	1/4 to 1 mi.	1 to 3 mi.
A	0	5	41.3	26.5	21.1
B	0	6	44.3	28.5	31.2
C	0	5	41.3	26.5	21.1
D	0	5	41.3	26.5	21.1
E	0	6	44.3	28.5	31.2
F	0	6	45.6	32.3	29.2
G	0	6	41.3	28.0	26.9
Agency Preferred Alternative	0	6	41.3	28.0	32.2

WILDERNESS AREAS/WILDERNESS STUDY AREAS - ELY TO DELTA SEGMENT
(areas passed and miles)

Route	Wildernesses passed	WSAs passed	<1/4 mi.	1/4 to 1 mi.	1 to 3 mi.
Direct	0	3	0.0	0.0	0.0
Cutoff	1	4	9.4	4.3	12.0
230kV*	0	3	9.4	3.9	3.0
Southern	0	5	7.8	6.5	16.0

* The 230kV Corridor Route is the Agency Preferred Alternative for the Ely to Delta segment.

Alternatives when ranked from the least miles of crossing near wilderness areas or WSAs to the most potential miles of crossing near wilderness areas or WSAs are as follows for the Midpoint to Dry Lake segment: (1) Route A, C, and D (2) Route G and Agency Preferred Alternative, (3) Routes B and E, (4) Routes F. The Ely to Delta segment alternatives routes rank as follows: (1) Direct Route, (2) 230kV Corridor Route (Agency Preferred Alternative), (3) Cutoff Route, (4) Southern Route. The No-Action would result in no impacts to adjacent wilderness areas or WSAs.

Issue 8 - Minimize Land Use Impacts

The following table shows various land uses by alternative route.

LAND USE - MIDPOINT TO DRY LAKE
(miles)

Route	Hill AFB MOA	Hill AFB Restricted	Nellis AFB MOA	Agricultural Lands	Range Allotments	Mining Claims
A	1.6	0.0	129.0	16.8	491.9	38.0
B	42.4	11.0	129.0	16.8	493.0	65.2
C	1.6	0.0	129.0	16.8	485.8	39.5
D	0.0	0.0	129.0	16.8	492.4	48.3
E	42.4	11.0	129.0	16.8	502.6	61.0
F	1.6	0.0	129.0	22.0	507.3	32.5
G	0.0	0.0	129.0	16.8	473.2	36.8
Agency Preferred Alternative	16.3	0.0	129.0	16.8	470.4	37.3

LAND USE - ELY TO DELTA SEGMENT
(miles)

Route	Hill AFB MOA	Hill AFB Restricted	Agriculture Lands	Prime/Unique Farmlands	Range Allotments	Mining Claims
Direct	44.1	55.1	0.0	0.0	135.1	7.8
Cutoff	123.0	0.0	0.0	0.0	153.9	6.9
230kV*	79.0	0.0	2.1	1.2	151.9	28.7
Southern	102.5	0.0	0.1	0.0	211.0	1.9

* The 230kV Corridor Route is the Agency Preferred Alternative for the Ely to Delta segment.

Alternatives when ranked from the least land use impacts to the most land use impacts are as follows for the Midpoint to Dry Lake segment: (1) Route A, C, and G, (2) Agency Preferred Alternative, (3) Route D, (4) Routes B, E, and F. The Ely to Delta segment alternatives routes rank as follows: (1) Cutoff Route, (2) Southern Route, (3) 230kV Corridor Route (Agency Preferred Alternative), (4) Direct Route. The No-Action would result in no impacts to land uses.

Issue 9 - Use Existing Transmission Line Corridors

Existing transmission lines and designated utility corridors would be paralleled by each of the alternatives routes as follows:

EXISTING CORRIDORS - MIDPOINT TO DRY LAKE
(miles)

Route	Parallel to existing transmission lines	Miles in Designated or Planning Utility Corridor	Miles Outside Designated or Planning Utility Corridor
A	204.0	370.4	142.6
B	162.5	362.2	153.9
C	162.5	337.0	169.9
D	214.8	377.1	136.4
E	204.0	364.7	159.0
F	172.7	329.1	194.9
G	172.1	379.4	125.3
Agency Preferred Alternative	172.1	350.4	162.4

EXISTING CORRIDORS - ELY TO DELTA SEGMENT
(miles)

Route	Parallel to existing transmission lines	Miles in Designated or Planning Utility Corridor	Miles Outside Designated or Planning Utility Corridor
Direct	13.2	14.3	115.8
Cutoff	74.2	75.5	78.4
230kV*	153.9	160.8	0.0
Southern	31.8	49.5	161.5

* The 230kV Corridor Route is the Agency Preferred Alternative for the Ely to Delta segment.

Alternatives were ranked from the most miles parallel to the least miles parallel to an existing transmission line as follows for the Midpoint to Dry Lake segment: (1) Route D, (2) Routes A and E, (3) Routes F and G and Agency Preferred Alternative, (4) Routes B and C. The routes rank as follows for the Ely to Delta segment: (1) 230kV Corridor Route (Agency Preferred Alternative), (2) Cutoff Route, (3) Southern Route, (4) Direct Route.

Alternatives were ranked from the least miles inside a designated or planning corridor to the most miles outside a designated or planning corridor for the Midpoint to Dry Lake Routes as follows: (1) Route G, (2) Route D, (3) Route A, (4) Route B, (5) Route E, (6) Agency Preferred Alternative, (7) Route C, (8) Route F. The Ely to Delta segment ranks as follows: (1) 230kV Corridor Route (Agency Preferred Alternative), (2) Cutoff Route, (3) Direct Route (4) Southern Route.

Issue 10 - Property Values and Compensation

While various studies have been conducted, there is no conclusive evidence to suggest that transmission lines would reduce property values. Some studies have found no substantial decrease in value attributable to transmission lines, while others have shown the market value of property to be reduced. Potential visual impacts could possibly attribute to alterations of property values.

Landowners would be compensated for an easement on or purchase of their land. Compensation is based on the fair market value of the land, as in the case where an easement is acquired based on the extent to which the use of the land is limited by the right-of-way.

Issue 11 - Effects on Agency Land Management Plans

The BLM - Under FLPMA of 1976, the BLM must manage public lands under the principle of multiple use, managing the various resources to best meet the needs of the public and our society. The conflict in the BLM's mission is to protect the quality of the land resources, environment, and public values while permitting development and use in a cost effective manner, such as a transmission line, which would help meet society's needs. The effects of the Management Framework Plans/Resource Management Plans (MFP/RMP) are addressed in accordance with the

BLM's planning regulations (43 CFR 1600 Subpart 1610.5). The MFP/RMPs that would be affected are listed in the Plan Amendment section below.

The Record of Decision would result in amending the plans (listed in the Proposed Plan Amendments section below) to allow for the granting of a 200-foot right-of-way for the SWIP. It would also allow for granting the substation sites and microwave communication facilities.

Road management planning would dictate access for construction and maintenance. Detailed road design would be completed following surveying and staking of the line in the field. Road designs would conform with planning standards of the BLM, FS, or other land managing agencies, as well as individual private landowners, prior to issuance of the Notice to Proceed to construct the line. The federal agencies would define the limits of construction and rehabilitation based upon transportation and road management objectives. In some cases, roads would have locked gates, be blocked, or be completely obliterated, depending upon the management policy for an increase of road access into a specific area. Access roads are part of the project description and, as such, were considered in the impact assessment for each environmental resource.

Proposed Plan Amendments

Both the BLM and FS have an inherent stated mission to protect the quality of the lands under their jurisdiction, while balancing the need for development when a need is shown. The impacts to goals and objectives of the Humboldt National Forest Land and Resource Management Plan, Burley District and Shoshone District MFPs, the RMPs of the BLM Resource Areas in the Boise and Shoshone District in Idaho, the RMPs of the Elko and Ely Districts in Nevada, and the RMPs for the Richfield District in Utah, and the Las Vegas District MFP are not considered significant for the following resources: range, recreation, timber, wildlife, wild horses and burrows, riparian/wetlands, minerals, and cultural resources.

Some of the alternative routes would deviate from the BLM designated or planning corridors established during the land use planning process. Some of the corridor deviations would be due to environmental issues along the established corridors and other deviations would be the result of project requirements. The SWIP DEIS/DPA is a Draft Environmental Impact Statement/Draft Plan Amendment. This document is termed a FEIS/PPA or Final Environmental Impact Statement/Proposed Plan Amendment. The SWIP decision document would serve as a plan amendment to RMPs and MFPs where the Agency Preferred Alternative would be outside a designated corridor in the three BLM Districts crossed. The plans now in effect that may be amended are:

Utah

- House Range Management Plan (Richfield District) - no plan amendment proposed
- Warm Springs Management Plan (Fillmore District) - no plan amendment proposed

Idaho

- Twin Falls Management Framework Plan (Burley District) - no plan amendment proposed
- Monument Resource Management Plan (Shoshone District) - no plan amendment proposed

Nevada

- Wells Resource Management Plan (Elko District) - plan amendment proposed
- Schell Management Framework Plan (Ely District) - plan amendment proposed
- Egan Resource Management Plan (Ely District) - plan amendment proposed
- Caliente Management Framework Plan (Las Vegas District) - plan amendment proposed
- Stateline Management Framework Plan (Las Vegas District) - plan amendment proposed

Plan Amendment Determinations

Figure 1-2 illustrates the location of the Agency Preferred Alternative which would also amend planning documents (listed above) to designate a utility corridor. The right-of-way for the Agency Preferred Alternative would be 200 feet in width. Future utility rights-of-way proposed for these same linear locations would be placed as near as practical immediately adjacent to the SWIP right-of-way. The corridor established through this plan amendment would be no wider than corridors previously established through the planning document of the affected land management agency. Establishing this corridor in this FEIS/PPA complies with designation criteria set forth in Section 503 of the FLPMA, 43 CRF 2806.2, and the BLM Manual Section 2801.11.

Critical resources, termed avoidance areas, would be crossed by various portions of the Agency Preferred Alternative. These avoidance areas are identified as high impacts and are identified in the Map Volume of the SWIP DEIS/DPA, described in Chapters 3 and 4 of the SWIP DEIS/DPA, and in revised maps and narrative sections in Chapter 3 of this document. There are no exclusion areas, or those areas set aside and designated for sole protection of a resource (e.g., wilderness area or WSA), crossed by the Agency Preferred Alternative.

All other designated or planning corridors established through a public land planning and EIS process would remain intact. All areas not included as a designated or planning corridor, an avoidance area, or an exclusion area would remain open to right-of-way use, but not as preferred locations. Site-specific clearances for cultural resources, threatened or endangered plants or animals, along with other required site-specific examinations which precede the right-of-way grant or notice to proceed with construction would be done prior to construction.

The BLM in Nevada designates utility corridors through their Resource Management Plan (RMP) process. The BLM in Idaho and Utah recognize existing utility lines as corridors. The Stateline Resource Area is currently preparing a RMP which would designate utility corridors. The Stateline Resource Area has released its Draft EIS/RMP. The RMP corridor studies and the SWIP EIS studies have been coordinated, and the preferred alternatives are similar. FLPMA of 1976 mandates to the extent practical, that the BLM consolidate future utility projects within the corridors that are established.

Factors of Analysis

Existing Facilities - Existing transportation and utility facilities are illustrated in the Map Volume and described on pages 3-33 through 3-50 of the SWIP DEIS/DPA.

Need - The Agency Preferred Alternative and proposed designation of this route as a corridor is not known to conflict with any current right-of-way applications, mineral explorations activities, or long range corridor studies.

Compatibility - Although many significant and insignificant impacts would result from construction of the SWIP along the Agency Preferred Alternative route, the corridor to be designated is compatible with intent to designate utility corridors.

Feasibility - The SWIP could be reasonably constructed within the proposed corridor.

Potential Impacts - The potential impacts of establishing a corridor along the Agency Preferred Alternative have been documented in Chapter 4 of the SWIP DEIS/DPA, in the SWIP DEIS/DPA Map Volume, in the Technical Report, and in Chapter 3 of this document.

Results of Coordination - Coordination with agencies and the public is documented in Chapter 5 of the SWIP DEIS/DPA, in the planning record, and in Chapter 2 of this document.

Construction, Operation, and Maintenance Plan

The Construction, Operation, and Maintenance (COM) Plan would include developing engineering plans and specifications (including centerline survey and tower locations), construction access plans, detailed rehabilitation plans, construction materials, environmental monitoring and control measures, preconstruction surveys for sensitive plants and/or wildlife species, cultural surveys and clearance procedures, and procedures for handling hazardous materials. The COM plan would be developed as a condition of the right-of-way grant and prior to any Notice to Proceed with construction. This plan would specify stipulations for construction, operation, and maintenance and responsibilities of the BLM, utility companies, and contractors.

The COM Plan would also address specifically how the project would be constructed within the 200 foot right-of-way. Additional NEPA documentation may be tiered to this EIS to evaluate alternative methods of construction that would be based on the specific methods proposed in the COM Plan (e.g., helicopter construction vs. conventional ground erection vs. a combination, etc).

In surveying the centerline of the selected route, the BLM would work closely with the utility to assure that the location relative to existing facilities is appropriate to meet electrical codes and to minimize impact to sensitive features. The precise centerline can only be determined once the engineering design and specific environmental survey activities are developed and coordinated. During the EIS process the centerline was a corridor approximately 1/4 mile either side of the "assumed centerline" drawn on the project maps for each of the alternative routes. This assumed centerline was not an engineered design. This centerline corridor width was agreed upon to allow the consideration of construction and design factors (e.g., topography) and the specific environmental resources that would be located during preconstruction surveys (e.g., cultural surveys, rare plant locations, tortoise burrows, etc.)

The BLM would monitor the construction, operation and maintenance of the SWIP. The BLM would perform periodic compliance checks after the lines would be put in operation to assure continued compliance to the terms and conditions of the right-of-way grant and to monitor environmental impacts associated with the project. If the selected route crosses lands administered

by other agencies (e.g., Forest Service, Bureau of Reclamation), these agencies would assign their personnel to the project

TABLES

TABLE 1-1

Route Comparison Table - Midpoint to Dry Lake Routes

(Formerly Table 2-4 in the SWIP DEIS/DPA)

	Route A*	Route B	Route C	Route D	Route E	Route F	Route G	Utility Preferred	Agency Preferred
Construction Access Levels (miles crossed)									
Agricultural lands	16.8	16.8	16.8	16.8	16.8	22.0	16.8	16.8	16.8
Existing access with spur roads	211	215.1	208.1	212.6	213.1	210.7	207.0	206.8	206.9
New access roads in flat (0-8%) terrain	152.5	130.1	151.0	155.6	134.2	157.0	163.2	162.7	163.8
New access roads in rolling (8-35%) terrain	92.4	109.1	91.4	89.6	111.4	89.4	85.1	84.8	82.4
New access roads in steep (35-65%) terrain	40.3	45.0	39.6	38.9	48.2	36.9	32.6	30.5	33.1
NATURAL ENVIRONMENT									
WILDLIFE (miles crossed)									
Desert tortoise habitat	53.2	53.2	53.2	53.2	53.2	53.2	53.2	53.2	52.1
Bald eagle habitat	15.3	32.8	16.3	5.8	18.2	16.3	19.6	19.6	6.0
Peregrine falcon	0	23.1	0	0	23	0	0	0	0
Ferruginous hawk nest	1.3	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.3
Sage grouse leks or winter range	35.2	36.8	30.7	34.1	36.3	32.8	40.6	42.2	37.2
Crucial Elk habitat	0	0	0	0	0	0	0	0	0
Bighorn sheep habitat and movement corridor	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Crucial pronghorn habitat	24.1	7.2	16.2	34.9	18.6	16.5	39.7	39.7	43.2
Critical Mule deer habitat	22.8	27.4	24.4	25.1	25.8	24.4	22.7	22.7	22.7
Wildlife Habitat Disturbed in acres - permanent (temporary)									
Desert tortoise habitat	78.5 (54.5)	78.5 (54.5)	78.5 (54.5)	78.5 (54.5)	78.5 (54.5)	78.5 (54.5)	78.5 (54.5)	78.5 (54.5)	78.5 (54.5)
Bald eagle nesting	14.0 (50.1)	37.1 (80.6)	15.8 (15.1)	6.3 (16.6)	17.6 (56.2)	15.8 (51.1)	25.2 (38.8)	25.2 (38.8)	7.4 (15.4)
Peregrine falcon	0 (0)	13.2(91.3)	0 (0)	0 (0)	13.2 (91.3)	0 (0)	0 (0)	0 (0)	0 (0)
Ferruginous hawk nest	3.5 (1.3)	2.1 (1.4)	3.5 (1.3)	3.5 (1.3)	3.5 (1.3)	3.5 (1.3)	2.1 (1.4)	2.1 (1.4)	3.5 (1.3)
Sage grouse leks or winter range	50.0 (78.9)	56.7 (69.7)	51.6 (59.6)	50.8 (74.0)	51.0 (86.6)	54.3 (64.1)	52.9 (92.6)	58.1 (94.2)	51.3 (95.5)
Crucial Elk habitat	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Bighorn sheep habitat and movement corridor	9.0 (8.5)	9.0 (8.5)	9.0 (8.5)	9.0 (8.5)	9.0 (8.5)	9.0 (8.5)	9.0 (8.5)	9.0 (8.5)	9.0 (8.5)
Crucial pronghorn habitat	31.9 (50.5)	7.7 (19.2)	20.7 (34.6)	57.0 (53.7)	23.0 (42.6)	20.7 (35.5)	66.8 (62.2)	66.8 (62.2)	70.9 (69.7)
Critical Mule deer habitat	32.2 (70.0	33.6 (90.8)	30.6 (83.0)	35.7 (72.3)	35.3 (77.8)	30.6 (83.0)	33.4 (64.3)	33.4 (64.3)	33.4 (64.3)
VEGETATION (miles crossed)									
Rare plants	1.3	1.3	1.3	1.3	1.3	4.2	1.3	1.3	1.3
Grasslands	109.1	97.3	96.3	97.3	116.3	110.2	97.8	98.6	103.5
Sage scrub	314.3	331.2	320.6	319.8	320.0	317.4	312.4	308.8	304.6
Mojave desert scrub	55.8	55.8	55.8	55.8	55.8	55.8	55.8	55.8	55.8
Woodland/mountain shrub/grasses	3.6	4.1	3.7	3.6	3.6	1.9	4.1	4.1	3.7
Riparian	3.2	3.2	3.7	5.3	3.3	3.8	4.8	4.5	5.1

* *Environmentally Preferred Route*

Table 1-1, Route Comparison Table - Midpoint to Dry Lake Routes (Continued)

(Formerly Table 2-4 in the SWIP DEIS/DPA)

	Route A*	Route B	Route C	Route D	Route E	Route F	Route G	Utility Preferred	Agency Preferred
EARTH RESOURCES (miles crossed, except as noted)									
Prime/Unique farmland	21.4	21.2	21.2	21.4	21.4	32	21.1	21.1	21.1
High water erosion potential soils	39.0	53.1	44.4	35.5	48.6	47.8	36.4	36.4	37.3
High wind erosion potential soils	58.8	58.9	58.8	52.1	64.3	73.3	46.7	44.1	49.5
Flood hazard areas	6.2	1.2	2.1	3.1	4.1	1.8	3.1	3.1	3.1
Landslide hazard areas	0	0	0	0	0	1.8	0	0	0
High paleontological sensitivity areas	23.8	38.6	35.3	21.9	25.5	37.4	30.6	19.4	20.5
Number of springs within 1/2 mile of route	42	20	20	45	17	17	45	45	45.0
Number of perennial streams crossed	26	27	23	22	22	8	27	20	20.0
HUMAN ENVIRONMENT									
LAND JURISDICTION (miles crossed)									
Bureau of Land Management	412.5	413.6	397.1	409.6	430.0	406.1	414.5	409.4	406.0
Forest Service	0	0	0	0	0	0	0	0	0
State	5.2	5.2	5.2	5.2	5.2	2.3	5.2	5.2	5.2
Private	95.2	97.3	104.6	98.7	88.5	115.6	85.3	87.0	83.1
Bureau of Reclamation	0.5	0.5	0.5	0.5	0.5	0	0.5	0.5	0.5
LAND USE (miles crossed, except as noted)									
Miles within 1 mile of wilderness study areas	32.8	50.6	32.6	47.3	50.6	42.3	32.8	32.8	32.8
Approximate number of residences within 1 mile	83	78	80	83	83	94	93	92	96
Miles parallel to H-frame 69kV transmission line	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9	55.9
Miles parallel to H-frame 138kV transmission line	52.0	10.5	10.5	62.8	52.0	10.5	26.0	26.0	26.0
Miles parallel to H-frame 230kV transmission line	13.7	13.7	13.7	13.7	13.7	28.2	13.7	13.7	13.7
Miles parallel to 345kV transmission line	97.2	74.0	74.0	97.2	97.2	10.5	78.9	78.9	78.9
Miles parallel to 500kV transmission line (incl. UNTP)	88.5	88.5	88.5	88.5	88.5	116.0	88.5	88.5	88.5
Total miles parallel to transmission lines	204.0	162.5	162.5	214.8	204.0	172.7	172.1	172.1	172.1
Miles in designated or planning utility corridor	370.4	362.2	337.0	377.1	364.7	329.1	379.4	377.6	350.4
Miles outside designated or planning utility corridor	142.6	153.9	169.9	136.4	159.0	194.9	125.3	132.1	162.4
Miles in Military Operating Areas of Hill AFB	1.6	42.4	1.6	0	42.4	1.6	0	0	16.3
Miles in R-6405 Restricted Area of Hill AFB	0	11.0	0	0	11.0	0	0	0	0
Miles in Military Operating Areas of Nellis AFB	129.0	129.0	129.0	129.0	129.0	129.0	129.0	129.0	129.0
Agricultural lands	16.8	16.8	16.8	16.8	16.8	22.0	16.8	16.8	16.8
Range allotments	515.9	527.4	505.5	506.1	520.8	519.6	501.7	491.6	485.0
Mining claims	38.0	65.2	39.5	48.3	61.0	32.5	36.8	36.6	37.3
Number of tanks and wells along centerline	11	10	11	12	11	10	10	10	10
Number of corrals along centerline	0	1	0	0	1	0	1	1	1
VISUAL RESOURCES (miles crossed, except as noted)									
Crossings of scenic highways and byways	2	3	3	2	2	3	3	3	3
Miles of route visible from residences within 1 mile	65.7	52.3	57.1	61.9	64.1	56.9	59.9	59.9	63.1
Scenic quality Class A landscapes	0.9	0.9	0.9	0.9	0.9	5.0	0.5	0.5	0.5
VRM Class II landscapes	7.3	17.8	5.6	10.0	19.5	7.5	8.1	8.1	6.7

* *Environmentally Preferred Route*

Table 1-1, Route Comparison Table - Midpoint to Dry Lake Routes (Continued)

(Formerly Table 2-4 in the SWIP DEIS/DPA)

	Route A*	Route B	Route C	Route D	Route E	Route F	Route G	Utility Preferred	Agency Preferred
CULTURAL ENVIRONMENT									
CULTURAL RESOURCES									
Number of historic sites within 1 mile of route	53	46	50	68	46	54	61	61	53
Number of ethnohistoric sites within 1 mile of route	13	16	14	12	15	16	14	14	14
Number of prehistoric sites within 1 mile of route	388	413	408	430	386	510	399	388	388
Number of other sites within 1 mile of route	9	8	7	12	11	6	9	10	9
Miles through predicted high sensitivity zones	18.4	19.3	17.2	20.5	18.4	11	20.6	20.5	18.4
Oregon Trail crossings	1	1	1	1	1	1	1	1	1
California Immigrant Trail crossings	3	1	2	3	2	3	2	3	3
Pony Express Trail crossings	1	2	1	1	1	1	1	1	2

SUMMARY OF ENVIRONMENTAL CONSEQUENCES	Route A*			Route B			Route C			Route D			Route E			Route F			Route G			Utility Preferred			Agency Preferred		
Impact Value	High	Mod	Low	High	Mod	Low	High	Mod	Low	High	Mod	Low	High	Mod	Low	High	Mod	Low	High	Mod	Low	High	Mod	Low	High	Mod	Low
VISUAL RESOURCES	13.5	72.7	427.0	14.5	62.6	439.2	14.5	66.8	425.8	13.5	68.5	431.4	13.5	71.7	438.7	19.5	71.0	433.7	14.7	65.4	424.9	14.9	67.5	419.5	14.9	69.1	419.4
BIOLOGICAL RESOURCES	15.0	36.5	200.3	26.2	24.2	204.2	20.4	25.6	181.7	13.5	48.4	214.6	17.8	34.8	221.2	17.8	27.2	177.7	24.8	41.0	191.7	25.6	45.0	206.4	22.5	42.5	207.0
CULTURAL RESOURCES	6.8	104.0	131.6	7.4	117.4	142.2	5.9	106.1	138.5	6.6	124.8	140.2	7.8	122.2	134.5	8.2	103.9	143.2	7.3	105.0	132.5	7.5	102.1	261.9	6.9	109.1	135.9
LAND USE RESOURCES	0	73.3	88.8	0	75.2	129.6	0	64.1	88.9	0	73.3	87.6	0	75.5	129.5	0	73.3	101.2	0	73.3	88.4	0	63.8	71.0	0	63.8	86.4
EARTH RESOURCES	0	46.7	454.3	0	50.6	453.5	0	45.0	449.9	0	46.9	452.4	0	54.6	455.3	0	45.4	465.4	0	40.9	456.4	0	23.3	473.7	0	25.6	471.3

COMMENTS

*Route A**
- low impacts to ferruginous hawks
- crosses least miles of riparian habitat
- crosses most miles of sage grouse habitat

Route B
- crosses least miles of riparian habitat
- crosses most miles of bald eagle nesting areas
- most miles of high water erosion potential soils
- least mileage visible from residences

Route C
- crosses least miles of sage grouse habitat
- crosses least miles of BLM-administered lands
- crosses least miles of VRM Class II landscapes

Route D
- crosses most miles of riparian habitat
- crosses least miles of bald eagle nesting areas
- crosses high mileage of sage grouse habitat

Route E
- crosses most BLM-administered lands
- crosses high mileage of sage grouse habitat
- high impacts to peregrine falcon

Route F
- visual impacts to Hagerman Fossil Beds National Monument
- crosses most agricultural land
- crosses most private lands
- most cultural sites within one mile
- most miles of high wind erosion potential soils

Route G
- reduces visual impacts to U.S. Highway 93
- crosses least miles of private land
- crosses high mileage of crucial pronghorn habitat

Utility Preferred Route
- crosses least steep terrain
- reduces visual impacts to U.S. Highway 93
- crosses most miles of sage grouse leks

Proposed Action
- reduces visual impacts to U.S. Highway 93
- crosses most miles of crucial pronghorn habitat
- crosses high mileage of sage grouse habitat
- most number of residents in 1 mile

	Route A*	Route B	Route C	Route D	Route E	Route F	Route G	Utility Preferred	Agency Preferred
Estimated cost (x millions)	**248**	**251**	**245**	**248**	**254**	**253**	**244**	**242**	**243**
Total Route Mileage	**513.0**	**516.1**	**506.9**	**513.5**	**523.7**	**524.0**	**504.7**	**503.1**	**501.6**
ENVIRONMENTALLY PREFERRED ROUTE									
Ranking	**1**	**4**	**2**	**2**	**2**	**5**	**3**	**3**	**3**

* *Environmentally Preferred Route*

TABLE 1-2

Route Comparison Table - Ely to Delta Routes

(Formerly Table 2-5 in the SWIP DEIS/DPA)

	Direct Route**	Cutoff Route**	230kV Corridor Route*	Southern Route
Construction Access Levels (miles crossed)				
Agricultural lands	0	0	0.9	0
Existing access with spur roads	35.0	39.9	59.1	55.7
New access roads in flat (0-8%) terrain	38.5	50.2	49.1	73.3
New access roads in rolling (8-35%) terrain	44.8	46.4	34.9	60.8
New access roads in steep (35-65%) terrain	17.5	17.4	15.6	21.2
NATURAL ENVIRONMENT				
WILDLIFE (miles crossed)				
Desert tortoise habitat	0	0	0	0
Bald eagle nesting	7.0	8.4	17.8	0
Peregrine falcon	0	0	0	0
Ferruginous hawk nest	0	0	4.5	10.1
Sage grouse leks or winter range	7.9	6.8	7.1	11.8
Crucial Elk habitat	0	0	5.5	0
Bighorn sheep habitat and movement corridor	0	0	0	0
Crucial pronghorn habitat	56.5	70.1	71.5	85.7
Critical Mule deer habitat	12.3	11.0	14.1	12.5
Wildlife Habitat Disturbed in acres - permanent (temporary)				
Desert tortoise habitat	0 (0)	0 (0)	0 (0)	0 (0)
Bald eagle nesting	2.6 (36.8)	2.6 (43.8)	16.6 (43.1)	0 (0)
Peregrine falcon	0 (0)	0 (0)	0 (0)	0 (0)
Ferruginous hawk nest	0 (0)	1.1 (1.2)	10.4 (16.7)	25.4 (25.1)
Sage grouse leks or winter range	8.5 (21.1)	7.6 (17.6)	15.7 (16.7)	32.9 (11.8)
Crucial Elk habitat	0 (0)	0 (0)	1.7 (29.7)	0 (0)
Bighorn sheep habitat and movement corridor	0 (0)	0 (0)	0 (0)	0 (0)
Crucial pronghorn habitat	62.2 (129.9)	85.6 (162.7)	83.9 (160.0)	106.0 (188.7)
Critical Mule deer habitat	9.5 (50.1)	10.3 (40.2)	14.8 (43.1)	11.7 (35.9)
VEGETATION (miles crossed)				
Rare plants	0	0	0	3.0
Grasslands	27.3	33.2	34.0	27.0
Sage scrub	83.3	100.9	109.6	155.0
Woodland/mountain shrub/grasses	0.6	0.5	3.6	7.0
Riparian	1.6	1.2	0.8	0.1

* *Proposed Action, Environmentally and Agency/Utility Preferred Routes*

** *Preferred by the National Park Service*

Table 1-2, Route Comparison Table - Ely to Delta Routes (Continued)

(Formerly Table 2-5 in the SWIP DEIS/DPA)

	Direct Route**	Cutoff Route**	230kV Corridor Route*	Southern Route
EARTH RESOURCES (miles crossed, except as noted)				
Miles of high water erosion hazard soils crossed	14.4	22.1	31.3	17.1
Miles of high wind erosion hazard soils crossed	8.6	12.6	19.2	40.1
Number of springs within 1/2 mile of route	2	2	6	12
Number of perennial streams crossed	0	0	4	3
Miles of flood hazard areas crossed	0	0	0	0
Miles of landslide hazard areas crossed	0	0	0.6	0
Areas of high paleontological sensitivity	55.5	55.6	64.9	84.7
HUMAN ENVIRONMENT				
LAND JURISDICTION (miles crossed)				
Bureau of Land Management	125.7	143.4	133.5	197.4
Forest Service	0	0	9.0	0
State	7.2	10.5	10.4	12.0
Private	0	0	10.2	1.6
LAND USE (miles crossed, except as noted)				
Miles of route wilderness/WSA within 1 mile	0	13.8	12.3	14.1
Number of residences within 1 mile	2	3	26	7
Miles parallel to H-frame 69kV transmission line	0	0	70.0	0
Miles parallel to H-frame 230kV transmission line	13.2	74.2	139.0	20.6
Miles parallel to 500kV transmission line	13.2	20.6	20.8	31.8
Total miles parallel to transmission lines	13.2	74.2	139.0	31.8
Miles in designated or planning utility corridor	14.3	75.5	145.9	49.5
Miles outside designated or planning utility corridor	115.8	78.4	14.9	161.5
Miles in Military Operating Area of Hill AFB	44.1	123.0	79.0	102.5
Miles in R-6405 Restricted Area of Hill AFB	55.1	0	0	0
Agricultural lands	0	0	0.9	0.1
Prime/Unique farmlands	0	0	0	0
Range allotments	135.1	153.9	152.8	211.0
Mining claims	7.8	6.9	25.8	1.9
Number of tanks and wells along route	1	0	1	0
Number of corrals along route	0	0	0	0
VISUAL RESOURCES (miles crossed, except as noted)				
Crossings of scenic highway or byways	0	0	1	3
Miles of route visible from residences within 1 mile	3.3	5.1	23.6	4.8
Scenic quality Class A landscapes crossed	0	4.2	4.2	0
VRM Class II landscapes crossed	0	0	0	2.0

* *Proposed Action, Environmentally and Agency/Utility Preferred Routes*

** *Preferred by the National Park Service*

Table 1-2, Route Comparison Table - Ely to Delta Routes (Continued)

(Formerly Table 2-5 in the SWIP DEIS/DPA)

	Direct Route**	Cutoff Route**	230kV Corridor Route*	Southern Route
CULTURAL ENVIRONMENT				
CULTURAL RESOURCES (miles crossed, except as noted)				
Number of historic sites within 1 mile of route	4	5	12	8
Number of ethnohistoric sites within 1 mile of route	8	8	8	10
Number of prehistoric sites within 1 mile of route	21	26	91	66
Number of other cultural sites within 1 mile of route	1	1	1	1
Miles through predicted high cultural sensitivity zones	0.8	0.8	8.0	6.0
Pony Express Trail crossings	1	1	0	0

	Direct Route**			Cutoff Route**			230kV Corridor Route*			Southern Route		
SUMMARY OF ENVIRONMENTAL CONSEQUENCES												
Impact Value	High	Mod	Low	High	Mod	Low	High	Mod	Low	High	Mod	Low
VISUAL RESOURCES	0.6	6.4	128.1	1.2	13.7	139.0	7.3	31.6	121.8	4.1	22.5	183.1
BIOLOGICAL RESOURCES	4.7	5.1	82.2	5.8	7.7	94.1	0.4	12.4	117.3	10.3	17.7	120.8
CULTURAL RESOURCES	4.6	19.1	16.3	4.6	32.7	21.4	5.5	39.7	44.5	11.6	41.7	48.0
LAND USE RESOURCES	0.0	65.3	38.9	0.0	0.0	123.0	0.0	0.0	80.9	0.0	0.0	103.2
EARTH RESOURCES	0.0	8.4	125.9	0.0	7.8	144.0	0.0	6.9	152.7	0.0	2.4	200.2

COMMENTS

*Direct Route***
- shortest route
- avoids visual impacts to Great Basin National Park
- crosses Leland-Harris spring complex
- crosses through R-6405 Restricted Area of UTTR
- crosses least agricultural lands
- crosses least miles of crucial pronghorn habitat

*Cutoff Route***
- crosses least agricultural lands
- avoids visual impacts to Great Basin National Park
- crosses least mileage of sage grouse habitat

*230kV Corridor Route**
- best utilizes the existing utility corridor
- crosses most miles of bald eagle nesting areas
- crosses high mileage of crucial pronghorn habitat
- most residences within 1 mile
- crosses most national forest lands and private lands

Southern Route
- longest route and most miles in steep terrain
- highest overall environmental impacts
- crosses most BLM-administered lands
- least miles in military operating areas of UTTR

	Direct Route**	Cutoff Route**	230kV Corridor Route*	Southern Route
Estimated cost (x million)	**66**	**72**	**77**	**100**
Total Route Mileage	**132.9**	**153.9**	**160.8**	**211.0**
ENVIRONMENTALLY PREFERRED ROUTE				
Ranking	**3**	**1**	**2**	**3**

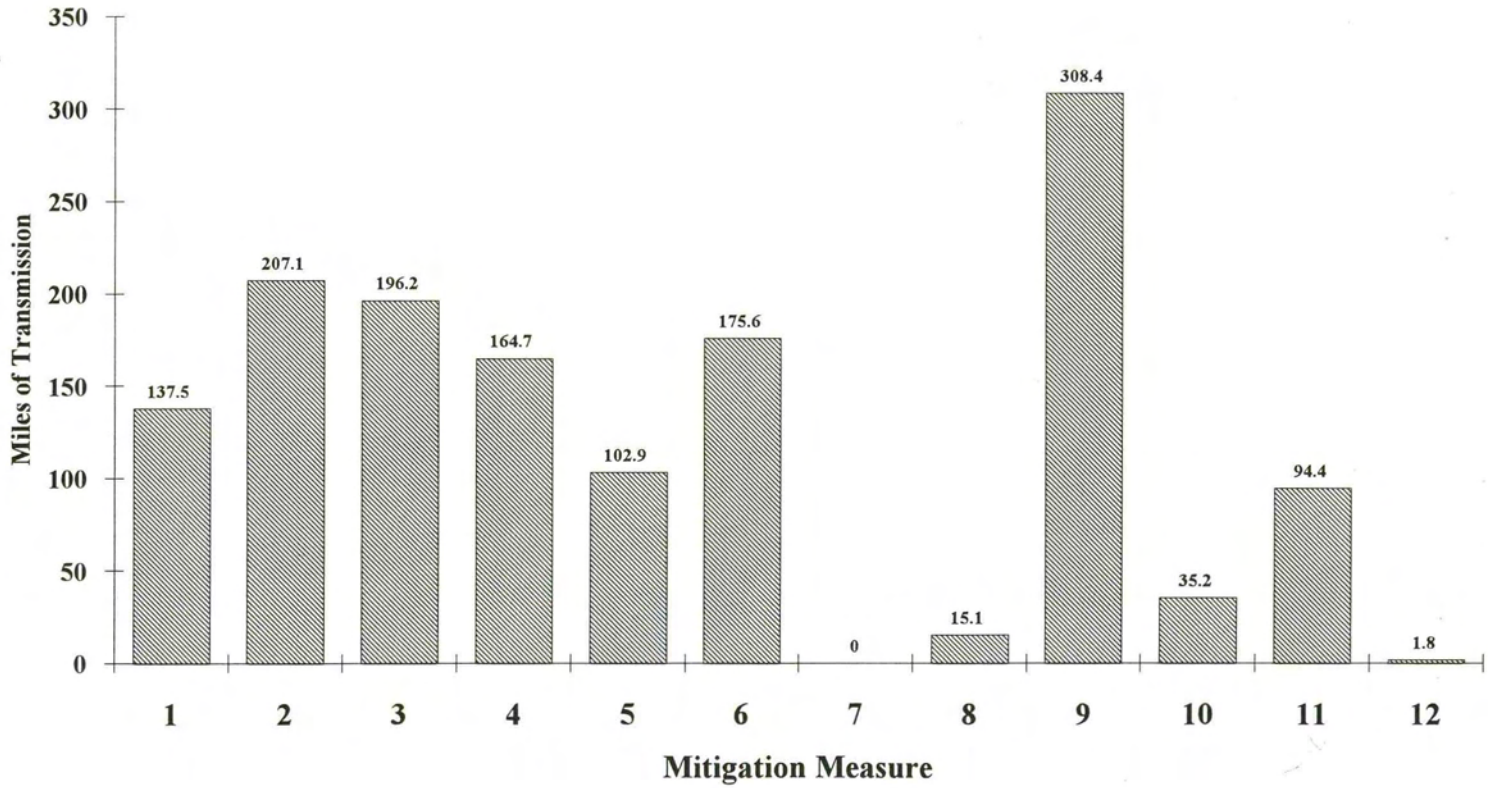
* *Proposed Action, Environmentally and Agency/Utility Preferred Routes*

** *Preferred by the National Park Service*

TABLE 1-3

SUMMARY OF SELECTIVELY COMMITTED MITIGATION FOR THE PROPOSED ACTION

Midpoint to Dry Lake Segment

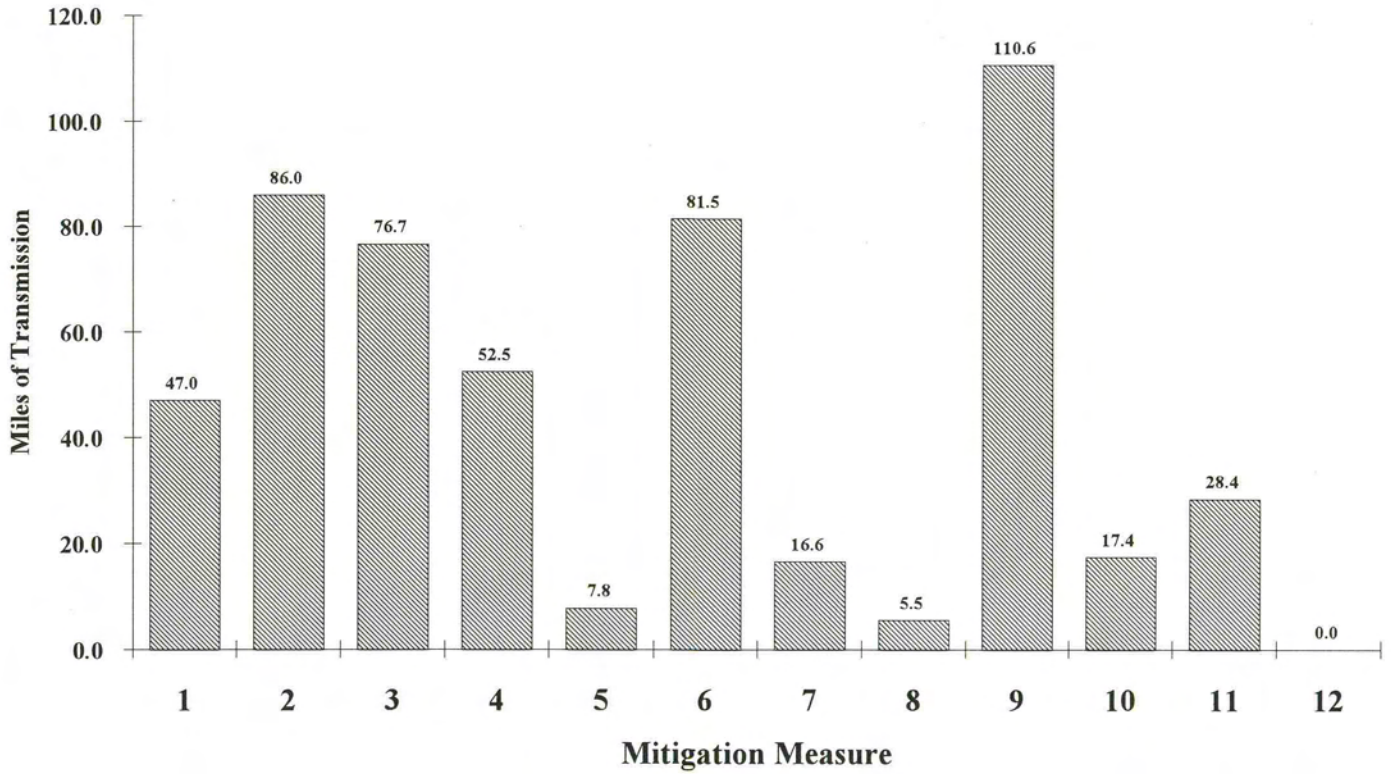


Note: Selectively Committed Mitigation Measures are described in Table 1-5

TABLE 1-4

SUMMARY OF SELECTIVELY COMMITTED MITIGATION FOR THE PROPOSED ACTION

Ely to Delta Segment



Note: Selectively Committed Mitigation Measures are described in Table 1-5

TABLE 1-5

Selectively Committed Mitigation Measures

Note: These selective mitigation measures apply only to specific impact locations that were identified in the EIS or during field investigations.

1. No widening or upgrading of existing access roads would be undertaken in the area of construction and operation, except for repairs necessary to make roads passable, where soils and vegetation are very sensitive to disturbance.

2. There would be no blading of new access roads in the area of construction and operation. Existing crossings would be utilized at perennial streams, National Recreational Trails, and irrigation channels. Off-road or cross-country access routes would be used for construction and maintenance. This would minimize ground disturbance impacts. These access routes must be flagged with an easily seen marker and the route must be approved in advance of use by the authorized officer.

3. The alignment of any new access roads or overland route would follow the designated area's landform contours where possible, providing that such alignment does not additionally impact resource values. This would minimize ground disturbance and/or reduce scarring (visual contrast).

4. All new access roads not required for maintenance would be permanently closed using the most effective and least environmentally damaging methods appropriate to that area with concurrence of the landowner or land manager (e.g., stock piling and replacing topsoil, or rock replacement). This would limit new or improved accessibility into the area.

5. Modified tower design or alternate tower type would be utilized to minimize ground disturbance, operational conflicts, visual contrast and/or avian conflicts.

6. In designated areas, structures would be placed so as to avoid sensitive features such as, but not limited to, riparian areas, water courses, and cultural sites, and/or to allow conductors to clearly span the features, within limits of standard tower design. This would minimize amount of sensitive feature disturbed and/or reduce visual contrast.

7. Standard tower design would be modified to correspond with spacing of existing transmission line structures where feasible and within limits of standard tower design. The normal span would be modified to correspond with existing towers, but not necessarily at every location. This would reduce visual contrast and/or potential operational conflicts.

8. At highway, canyon, and trail crossings, towers are to be placed at the maximum feasible distance from the crossing, to reduce visual impacts.

Table 1-5, Selectively Committed Mitigation Measures (Continued)

9. Nonspecular conductors would be used, where specified by the authorized officer, to reduce visual impacts.

10. "Dulled" metal finish towers would be used to reduce visual impacts.

11. With the exception of emergency repair situations, right-of-way construction, restoration, maintenance, and termination activities in designated areas would be modified or discontinued during sensitive periods (e.g., nesting and breeding periods) for candidate, proposed threatened and endangered, or other sensitive animal species. Sensitive periods, species affected, and areas of concern would be approved in advance of construction or maintenance by the authorized officer.

12. Helicopter placement of towers would be used to reduce ground disturbance impacts (e.g., soil erosion).

TABLE 1-6

Generic Mitigation Measures Included In The Project Description

1. All construction vehicle movement outside the right-of-way would normally be restricted to predesignated access, contractor acquired access or public roads.

2. The areal limits of construction activities would normally be predetermined, with activity restricted to and confined within those limits. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate survey or construction activity limits.

3. In construction areas where recontouring is not required, vegetation would be left in place wherever possible and original contour would be maintained to avoid excessive root damage and allow for resprouting.

4. In construction areas (e.g., marshalling yards, tower sites, spur roads from existing access roads) where ground disturbance is significant or where recontouring is required, surface restoration would occur as required by the landowner or land management agency. The method of restoration would normally consist of returning disturbed areas back to their natural contour, reseeding (if required), cross drains installed for erosion control, placing water bars in the road, and filling ditches.

5. Watering facilities (e.g. - tanks, natural springs and/or developed springs, water lines, wells, etc.) would be repaired or replaced if they are damaged or destroyed by construction activities to their predisturbed condition as required by the landowner or land management agency.

6. Towers and/or ground wire would be marked with high-visibility devices where required by governmental agencies (Federal Aviation Administration).

7. On agricultural land, right-of-way would be aligned, in so far as practical, to reduce the impact to farm operations and agricultural production.

8. Prior to construction, all supervisory construction personnel would be instructed on the protection of cultural and ecological resources. To assist in this effort, the construction contract would address: (a) Federal and state laws regarding antiquities and plants and wildlife, including collection and removal; (b) the importance of these resources and the purpose and necessity of protecting them.

9. Cultural resources would continue to be considered during post-EIS phases of project implementation in accordance with the programmatic agreement that would be developed in conjunction with preparation of the EIS. This would involve intensive surveys to inventory and evaluate cultural resources within the selected corridor and any appurtenant impact zones beyond

the corridor, such as access roads and construction equipment yards. In consultation with appropriate land managing agencies and state historic preservation officers, specific mitigation measures would be developed and implemented to mitigate any identified adverse impacts. These may include project modifications to avoid adverse impacts, monitoring of construction activities, and data recovery studies.

10. The Project Sponsors would respond to complaints of line-generated radio or television interference by investigating the complaints and implementing appropriate mitigation measures. The transmission line would be patrolled on a regular basis so that damaged insulators or other line materials that could cause interference are repaired or replaced.

11. The Project Sponsors would apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing a right-of-way, to the mutual satisfaction of the parties involved.

12. The Project Sponsors would continue to monitor studies performed to determine the effects of audible noise and electrostatic and electromagnetic fields in order to ascertain whether these effects are significant.

13. Roads would be built as near as possible at right angles to the streams and washes. Culverts would be installed where necessary. All construction and maintenance activities shall be conducted in a manner that would minimize disturbance to vegetation, drainage channels, and intermittent or perennial streambanks. In addition, road construction would include dust-control measures during construction in sensitive areas. All existing roads would be left in a condition equal to or better than their condition prior to the construction of the transmission line. Towers will be sited with a minimum distance of 200 feet from streams.

14. All requirements of those entities having jurisdiction over air quality matters would be adhered to and any necessary permits for construction activities would be obtained. Open burning of construction trash would not be allowed unless permitted by appropriate authorities.

15. Fences and gates would be repaired or replaced to their original predisturbed condition as required by the landowner or the land management agency if they are damaged or destroyed by construction activities. Temporary gates would be installed only with the permission of the landowner or the land management agency; and would be restored to its original predisturbed condition following construction.

16. Transmission line materials would be designed and tested to minimize corona. A bundle configuration (three conductors per phase except for the Ely to Delta segment would be two conductors per phase) and larger diameter conductors would be used to limit the audible noise, radio interference (RI), and television interference (TVI) due to corona. Tension would be maintained on all insulator assemblies to assure positive contact between insulators, thereby avoiding sparking. Caution would be exercised during construction to avoid scratching or nicking the conductor surface which may provide points for corona to occur.

Table 1-6, Generic Mitigation Measures Included In the Project Description (Continued)

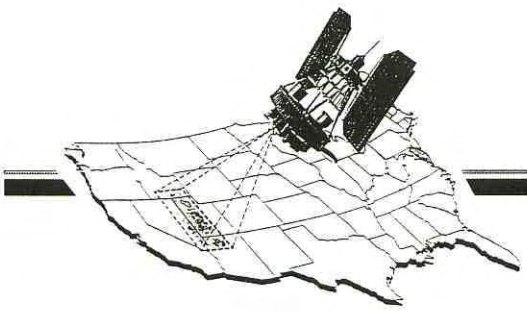
17. During operation of the transmission line, the right-of-way would be maintained free of non-biodegradable debris.

18. The primary focus of paleontological mitigation efforts should be areas of greatest disturbance and areas likely to have significant fossils.

19. Mitigation measures that will be developed during the consultation period under Section 7 of the Endangered Species Act (1974) will be adhered to as specified in the Biological Opinion of the USDI Fish and Wildlife Service.

20. Hazardous materials shall not be drained onto the ground or into streams or drainage areas. Totally enclosed containment shall be provided for all trash. All construction waste including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials shall be removed to a disposal facility authorized to accept such materials.

21. Pre-construction surveys for plants and wildlife species designated as sensitive or of concern will be conducted in areas of known occurrence or habitat as stipulated by the land-administering agency during the development of the Construction, Operation, and Maintenance Plan once the transmission line centerline, access roads, and tower sites have been located and staked in the field.



CHAPTER 2
PUBLIC PARTICIPATION

CHAPTER 2
PUBLIC PARTICIPATION

INTRODUCTION

In response to the National Environmental Policy Act of 1969 (NEPA) and the Council of Environmental Quality (CEQ) regulations (1978) for implementing the NEPA, an extensive coordination program was developed for the Southwest Intertie Project (SWIP) to ensure that all the appropriate members of the public and federal, state, and local agencies were contacted, consulted, and given an adequate opportunity to be involved in the process. Chapter 5 (Consultation and Coordination) in the Draft Environmental Impact Statement/Draft Plan Amendment (DEIS/DPA) describes the public and agency scoping process, the public participation program, the issues and concerns identified from the public and agency comments, and the environmental planning process. This section describes activities of this process that have occurred during the review of the SWIP DEIS/DPA and the preparation of the Final Environmental Impact Statement/Proposed Plan Amendment (FEIS/PPA).

PUBLIC INFORMATION

During the course of the project 12 newsletters, fact sheets, and project updates were published to inform the interested parties about the environmental process, the project status, and opportunities to participate. Publications were sent to the individuals, organizations, and agencies on the project mailing list. The mailing list included names and addresses from the lead and cooperating agencies and Idaho Power Company's (IPCo) existing mailing lists, as well as all potentially affected public and federal, state, and local agencies and environmental organizations. The mailing list was expanded to over 3,000 interested parties during the process. Copies of the newsletters, fact sheets, and project updates sent out prior to the release of the SWIP DEIS/DPA are located in the Volume I - Objectives, Procedures, and Results technical report.

A Project Update was published in May 1992 announcing the release of the SWIP DEIS/DPA to the public for review and comment. Information regarding the comment period for the SWIP DEIS/DPA was also given. The Formal Public Meetings were announced indicating where and when the public could comment on the accuracy or adequacy of the SWIP DEIS/DPA.

A Project Update was released in June 1992 notifying the public concerning an error in the SWIP DEIS/DPA on Panel 4 in the Map Volume. A map inset was shown to correct the error. Meeting times and places for the formal public meetings were also announced again.

A Project Update was released in June 1993 announcing the release of the SWIP FEIS/PPA with information regarding the protest and appeal period for affected agencies. A summary of the comments received on the SWIP DEIS/DPA was also included.

STEERING COMMITTEE

A Steering Committee was established at the outset of the project to guide Dames & Moore through the EIS preparation and to review data and decision criteria. The Steering Committee was comprised of representatives of:

- Bureau of Land Management (BLM)
  - Burley District (Idaho)
  - Boise District (Idaho)
  - Shoshone District (Idaho)
  - Elko District (Nevada)
  - Ely District (Nevada)
  - Las Vegas District (Nevada)
  - Richfield District (Utah)
  - Utah State Office
  - Idaho State Office
  - Nevada State Office
- Forest Service
  - Humboldt National Forest (Nevada)
- National Park Service
  - Great Basin National Park (Nevada)
  - Western Region (California)
- Bureau of Indian Affairs
- Dames & Moore
- IPCo
- Los Angeles Department of Water and Power (LADWP)

Eleven Steering Committee meetings were held throughout the SWIP to discuss the status and issues of the project and to provide review and input:

- first meeting (February, 1989) - discussion of the coordination between the agencies, the progress of the regional study, and the selection of alternative corridors
- second meeting (May, 1989) - public meetings, responses, and letters from the first fact sheet were reviewed, wildlife was the major topic of discussion
- third meeting (August, 1989) - discussion and review of the BLM actions on the SWIP including record requirements, right-of-way applications, and plan amendments
- fourth meeting (November, 1989) - discussion of a new alternate route from the North Steptoe area, Hill Air Force Base conflicts, and the impact assessment/mitigation planning process

- fifth meeting (April, 1990) - discussion of scope expansion, right-of-way application amendments, and draft purpose and need statement; Dames & Moore presented the substation site selection, the subroute analysis process, and Geographic Information Systems (GIS) processing for resource impacts

- sixth meeting (June, 1990) - the draft purpose and need statement, results of GIS impact assessment modeling, the subroute analysis process and the feasibility of expanding the SWIP south of Ely were the main points of the meeting; the dates for additional scoping meetings were also announced

- seventh meeting (September, 1990) - opening discussion began with the Clark County desert tortoise Conservation Plan and how this plan should be addressed in the SWIP; the route selection process, Dry Lake alternative, and mitigation commitments were also discussed

- eighth meeting (December, 1990) - the SWIP DEIS/DPA outline, purpose and need statement, and the effects of the impact assessment results on the routing alternatives were discussed; the desert tortoise issue as well as the cumulative effects of the SWIP and the visual effects to Great Basin National Park and Interstate 84 were discussed

- ninth meeting (July, 1991) - a preliminary SWIP DEIS/DPA was submitted to the Steering Committee for review; the addition of several new routing alternatives were discussed as well as the issue of potential visual impacts to Wilderness Study Areas (WSA)

- tenth meeting (March, 1992) - discussion included final review of comments on the preliminary SWIP DEIS/DPA; the Stateline Resource Area of the BLM's Draft Resource Management Plan (RMP) and the on going desert tortoise consultation and Habitat Conservation Plan

- eleventh meeting (December, 1992) - discussion included comments and responses on the preliminary SWIP FEIS/PPA, content of the Purpose and Need, and the findings of the field review of Leland Harris Spring Complex.

FORMAL PUBLIC MEETINGS

The purpose of the Formal Public Meetings was to receive views and comments regarding the accuracy and adequacy of the SWIP DEIS/DPA. Six Public Meetings were held in August 1992 in Idaho, Nevada, and Utah at six locations:

City	Location	Date
Twin Falls, Idaho	Weston Plaza	August 3rd, 1992
Wells, Nevada	Wells High School	August 4th, 1992
Ely, Nevada	Bristlecone Convention Center	August 5th, 1992
Delta, Utah	City Council Chambers	August 6th, 1992
Caliente, Nevada	Soil Conservation Service Center	August 19th, 1992
Las Vegas, Nevada	BLM District Office	August 20th, 1992

The meetings were announced in the May and June 1992 SWIP Update and distributed to the approximately 3,000 people on the mailing list. Press releases were sent out in July and August, 1992 to 17 newspapers serving the communities in the area to announce the meetings:

Location	Paper	Insertion dates
Boise, Idaho	Idaho Statesman	Wed 7/29
Caliente, Nevada	Lincoln County Record	Week 7/27
		Week 8/3
Cedar City, Utah	Daily Spectrum	Wed 8/5
St. George, Utah	Daily Spectrum	Wed 8/5
Delta, Utah	Millard County Chronicle Progress	Thurs 7/27
Elko, Nevada	Free Press	Wed 7/29
		Fri 7/31
Ely, Nevada	Times	Fri 7/31
		Mon 8/3
Filmore, Utah	Millard County Gazette	Week of 8/3
Las Vegas, Nevada	Sun	Wed 8/5
Las Vegas, Nevada	Review Journal	Thurs 8/6
Nampa, Idaho	Press Tribune	Wed 7/29
Reno, Nevada	Gazette Journal	Wed 7/29
Richfield, Utah	Reaper	Week of 7/27
Salt Lake City, Utah	Deseret News	Wed 7/29
Salt Lake City, Utah	Tribune	Thurs 7/30
Twin Falls, Idaho	Times News	Wed 7/29
		Fri 7/31
Wendover, Nevada	High Desert Advocate	Week of 7/27

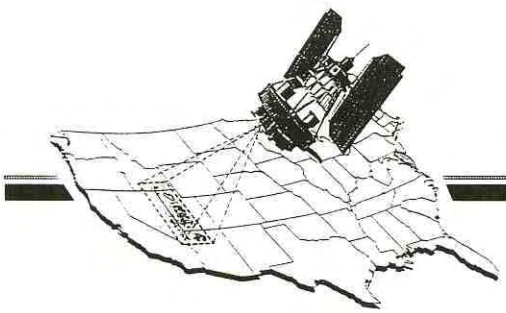
Meeting information flyers were also posted in the community at and around public establishments.

Each meeting began with introductions and a presentation given by a BLM representative with project personnel from the BLM, the IPCo, LADWP and Dames & Moore present. The presentation addressed the project description, purpose and need, the SWIP DEIS/DPA planning process, alternative routes identified, and the project schedule. The meeting then opened up for comments from the public.

A total of 75 people attended the six formal public meetings held in August, 1992. All comments and questions concerning the SWIP DEIS/DPA at the meetings were recorded and have been responded to in Chapter 5 of this document.

Frequently voiced comments included:

- visual impacts to residences
- health and safety
- minimize land use impacts
- property values
- need for the transmission line
- alternatives to the project



CHAPTER 3

MODIFICATIONS AND ADDITIONAL STUDIES

CHAPTER 3
MODIFICATIONS AND ADDITIONAL STUDIES

PURPOSE AND NEED

Because of public concern about the purpose and need for the Southwest Intertie Project (SWIP) Draft Environmental Impact Statement (DEIS/DPA), additional information about the Purpose and Need is presented in this chapter. This information is an expansion of the Purpose and Need described in Chapter 1 of the SWIP DEIS/DPA.

Introduction

Today's electric generation and transmission system play a critical role in the nation's economic and social well being. Many utility customers take its operation for granted as they enjoy electric services relatively free of interruption. There is an increasing need for utilities in the western United States to work cooperatively to maintain greater resource and transmission flexibility and enhance service reliability through transmission system interconnections.

Electric utilities are responsible for providing adequate supplies of reliable, economic electricity to their customers. The present load growth in the western United States, coupled with the expense and difficulties of building new generating resources, reinforces the need to provide for inter-regional transfers of energy.

The principal function of any interconnected transmission system is to provide for the reliable transfer of electric energy from one regional electric system to another, including generation from plants at various locations within that regional system to various load centers at other locations. The integration of large and small generating units in a transmission network permits not only efficient economic dispatch of power within regions during normal conditions, but also the transfer of power between regions during emergencies. The strategic importance of transmission is much greater than is indicated by its relative low cost as compared to the overall cost of electricity. Adequate interconnections provide the key to generation resource diversity, sharing of reserve generating capacity, and efficient utilization of conservation and new or existing generating capacity. In short, interconnection is the coordinating medium that makes possible the most efficient use of electrical facilities in any area or region.

Diversity Between Regions of the WSCC

There is a regional need to take advantage of the seasonal diversity which exists between the loads and resources of the Northwest and the Southwest. Purchases and exchanges over the SWIP would help the entire Western Systems Coordinating Council (WSCC) region meet load growth by utilizing existing resources more efficiently. It is this seasonal diversity, specifically between the Arizona-New Mexico Power Area (ANMPA) and the Northwest Power Pool (NWPP) and between the NWPP and the California-Southern Nevada Power Area, that the SWIP is needed to serve. There are adequate

markets in both the NWPP and the Southwest for over 1200 megawatts (MW) of seasonal diversity transmission with a resulting potential for deferring significant generation resource additions.

Figure 3-1 illustrates the projected WSCC regional peak and average loads, generation capability, inter-regional transfer capability, and summer/winter load diversity for the year 2000 (WSCC 1992 IE-411). The generation capacity numbers reflect all generators at their rated capacity, but are not representative of actual available resources at any one time (does not include reserve margin, effects of variable water flows, or the impacts of unplanned outages). For example, in the NWPP region, the reserve margin requirements total approximately 8000 MW. Therefore, the planned available capacity for the year 2000 is 61,000 MW (total installed capacity = 69,000 MW). The available seasonal diversity in this figure is the difference between the peak winter load and the peak summer load of that region. The inter-regional transfer capability shown is the rated capability expected for the year 2000 less the firm inter-regional generation transfers.

Northwest Power Pool

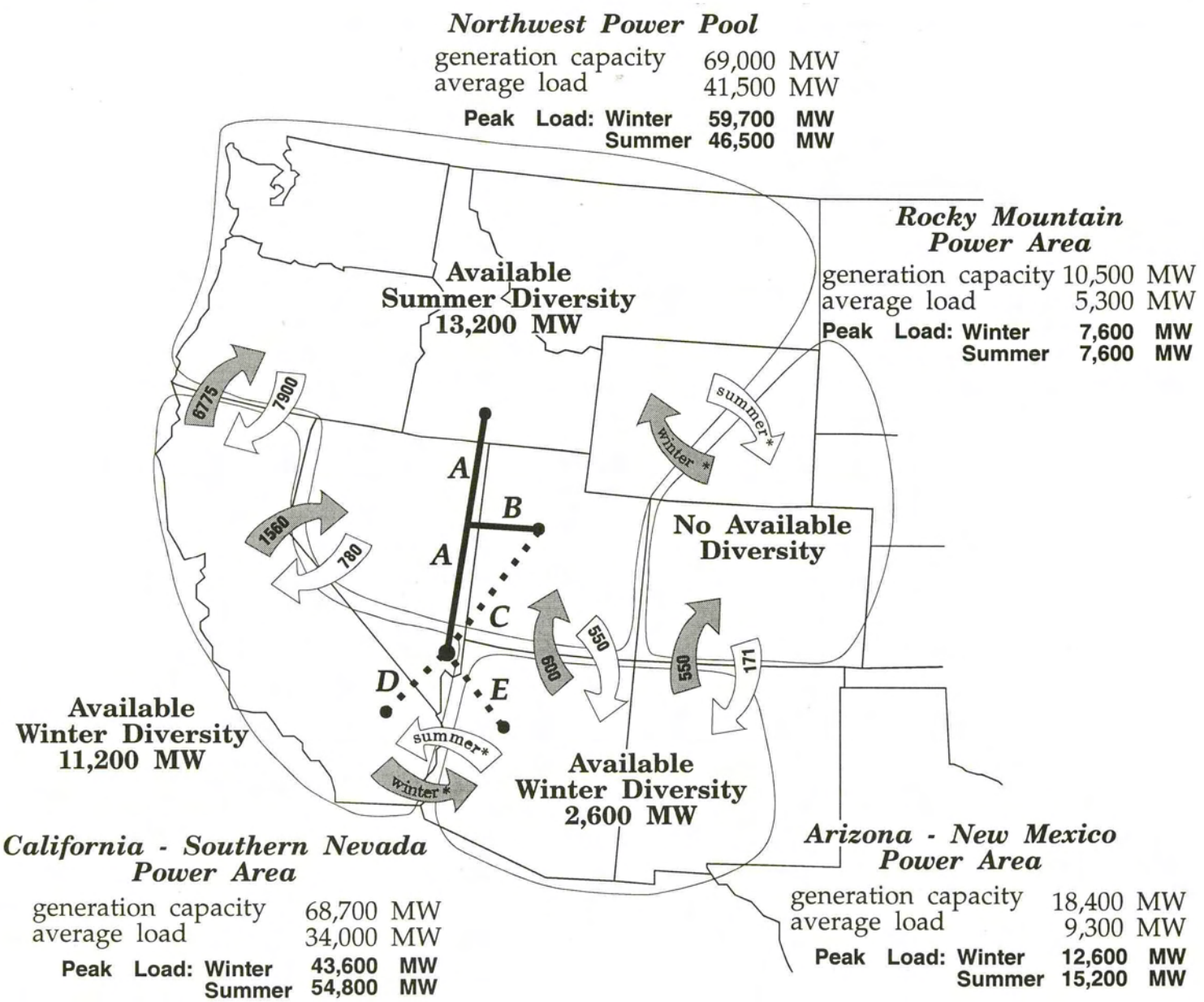
The NWPP has about 13,200 MW of seasonal load diversity available during the summer peak period. The total summer export capability from the NWPP is about 9200 MW (7900+780+550). During the winter, there is about 13,800 MW of seasonal load diversity available in the California and Arizona power areas. The total winter import capability to the NWPP is about 8900 MW (6775+1560+600). About 3000 MW of seasonal load diversity remains untapped and available for seasonal exchange.

The transfer capability between the NWPP and the California-Southern Nevada Power Area is in two major paths. The northwestern path is made up of the Pacific Alternating Current (AC) Intertie (3-500 kilovolt (kV) transmission lines = 4800 MW north to south and 3675 MW south to north) and the Pacific Direct Current (DC) Intertie (+/- 500kV = 3100 MW bi-directional). The southwestern path is made up of three subcomponents, the Sierra Pacific Power-Pacific Gas and Electric transmission lines (2-120kV lines and 1-60kV transmission line = 160 MW bi-directional), the PacifiCorp-Nevada Power transmission line (345kV = 300 MW north to south), and the Intermountain Transmission System (ITS) DC transmission line (+/-500kV = 1920 MW north to south and 1400 MW south to north). The ITS has a total capability of 1920 MW, however, 1600 MW are reserved for Intermountain Generating Station (IGS). The south to north capability is restricted by two 345kV ITS/PacifiCorp interconnections. In order to utilize this 1920 MW ITS capability, the IGS generation would need to be displaced which is not likely due to its low power production cost.

The transfer capability between the NWPP and the ANMPA is made up of one 230kV PacifiCorp/Western Area Power Administration (WAPA) interconnection and one 345kV PacifiCorp/Arizona Public Service transmission line. Together these transmission lines are rated at 550 MW north to south and 600 MW south to north. The 345kV interconnection capability is usually restricted by ANMPA system transfers south and west of the Four Corners area.

Rocky Mountain Power Area

The transfer capability between the Rocky Mountain Power Area (RMPA) and the NWPP is not significant due to internal transmission constraints. The RMPA has little seasonal diversity.



Note: all values in megawatts (MW), peak load excludes interruptable load

SWIP Projects (A & B)
Other Proposed Projects (C,D,E)

Map Symbol	Transmission Project	Transmission Rating (MW)
A	SWIP (Midpoint to Dry Lake)	1200
B	SWIP (Ely to Delta)	1100
C	Utah-Nevada (UNTP)	1100
D	Mead-Adelanto	1200
E	Mead-Phoenix	1300

Transmission Capacity is firm capability less firm inter-area generation transfers.

winter summer

* Transfer capability not significant due to internal transmission or no inter-area seasonal diversity.

SOURCE: WSCC 1992 IE-411 Report

WSCC Seasonal Diversity Potential for the Year 2000

Figure 3-1

The transfer capability between the RMPA and the ANMPA is shown as the combination of the 230kV and 345kV transmission lines between Colorado and Arizona-New Mexico. The transmission lines are capable of 550 MW bi-directionally, however, a firm generation integration commitment of 379 MW north to south exists.

Arizona-New Mexico Power Area

The ANMPA has about 2600 MW of seasonal diversity available during the winter peak period. Of this 2600 MW, only about 600 MW are currently usable between the ANMPA and the NWPP.

The transfer capability between ANMPA and the California-Southern Nevada Power Area is about 7000 MW, with nearly half of this capability committed for firm generation integration commitments. This transmission path is generally not significant for seasonal diversity exchanges due to the two regions having coincidental peaks.

Diversity Benefits from Interconnections

Current forecasts of utility resource requirements portray the fact that the future is uncertain and identify steps to reduce the risks resulting from that uncertainty. For the same reasons that investors diversify investment portfolios to minimize the risks associated with individual stocks, utilities seek to diversify their system resources to minimize the risks associated with individual resource options. To reduce the risks associated with uncertainty of load growth, utility planners favor resources (e.g., transmission interconnection, new power plants, or other generation facilities) that can be developed in the shortest possible length of time, or shortest "lead time". Reducing the lead time needed to acquire new resources allows the actual commitment to construct a resource to be made when forecasting uncertainty has been reduced as much as possible. Taking advantage of regional diversity through the SWIP would increase the number of resource options available to a utility and would serve as a tool for reducing the risk of overbuilding or underbuilding generating resources as a result of load and resource uncertainties.

Transmission lines play a major role in managing the costs of an electric system service. Adequate and available transmission capacity allows interaction between supplies and markets for the most economical exchange of power, with benefits including:

- *Diversity of Area and Use* - Over the history of electric system development, diversity was first captured in neighborhoods, then cities and regions as transmission systems were expanded. The fact that the system is used at different times for different purposes means that the broader the area the system encompasses, the fewer generating resources are required to serve it, lowering the total amount of required generation.

- *Market Diversity* - Competitive forces should drive down the cost of the utilities' future resource options as suppliers of generation and conservation gain access to the transmission grid.

- *Fuel and Supply Diversity* - Transmission provides a way to enhance plans for environmental mitigation between regions. For example, generation may be reduced in one region during times when there are air quality concerns or river flows may be increased for migrating salmon. Transmission also provides shifting among fuel supplies (e.g., coal versus natural gas) for cost savings as prices fluctuate or as air emission requirements change.

Conservation and Demand-Side Management

Conservation and other demand-side management programs are expected to reduce, but not eliminate, the region's need for new generating resources. Conservation and demand-side management programs are an integral part of the resource strategy of every utility considering partnership in the SWIP. Regulatory requirements dictate that supply-side and demand-side resource options should be considered on an equal basis in a utility's plan to acquire lowest cost resources. However, conservation does not correspondingly reduce the value of regional transmission for minimizing resource costs.

Even with reduced generating requirements, environmental and economic considerations may require siting new generation at substantial distances from population and load centers, thus requiring transmission such as the SWIP. Regional conservation may be more fully developed given the availability of adequate regional transmission. Without such transmission, the cost effectiveness of conservation programs must be determined on the basis of the avoidable generating resource costs of an individual utility. Utilities having a lower avoided cost may be unable to develop economical conservation resources at the same level as those utilities with a higher avoided cost. With transmission, conservation throughout the region could be developed to the level of the highest avoidable generating costs in the region.

Transmission facilities like the SWIP would contribute to the region's task of meeting future load growth most efficiently with the least amount of new generating capacity. It is important to recognize the seasonal load diversity within the region. Transmission would allow existing resources to be used to serve seasonal load requirements in one part of the region while also meeting new load growth requirements in another part of the region. Therefore, total regional resource requirements (e.g., generation) can be reduced by transmission. Transmission, such as the SWIP, should be considered as a resources option along with new generating resources.

Utility Cost Minimization Initiatives

The goal of electric utilities is to provide reliable electrical service at the lowest reasonable infrastructure cost. Both state and federal regulatory agencies establish rules and review the proposed actions of utility companies to assure that electrical consumers are provided service at the lowest possible costs. Recent industry initiatives to minimize costs have focused on three areas:

- *Integrated Least Cost Planning* - Utilities are required by state utility commissions to consider both conservation and new generation options equally in developing a resource plan that achieves the lowest cost to electrical consumers.

- *Free Enterprise in the Generation Market* - Additional competition in the generation market brought about by independent power producers allows the market's competitive forces to drive down the cost of new generation. Generation represents the largest cost component of the electric power system.

- *Environmental Costs* - As part of the Clean Air Act, governmental and regulatory bodies are attempting to establish values for emissions from power plants to quantify and reduce "total societal costs" associated with resource options.

Environmental and Consumer Benefit Tests

Transmission lines must meet two tests to be shown beneficial to society: environmental impacts and consumer benefits. The first test is to determine if the potential impacts of the transmission line would be environmentally acceptable, and the second is the consumer benefit test. Until a project has cleared environmental hurdles it is not considered prudent to include it in least cost plan alternatives. Utilities cannot make plans to meet service requirements without some confidence that a resource option will be possible. Further, to do so would presume a favorable decision through the National Environmental Policy Act (NEPA) process.

As the nation continues to reduce dependence on imported oil, renewable energy resources such as wind, solar, geothermal, biomass, and hydropower which may be available only at fixed sites need to be encouraged through better access to markets. In order to economically develop these resources, as well as other independently developed power plants, their developers must have access to transmission facilities to move the power to utilities that need additional sources of power.

The SWIP could facilitate transactions which help protect the environment. For example, transmission contracts could be structured which redistribute inter-regional generation in such a way that northwest river flows could aid in the salmon recovery process. There are currently many proposals being considered regarding the operation of federal dams on the Columbia River. It is unknown how Columbia River operations and salmon recovery plans will affect northwest-southwest power exchanges at this time. As environmental costs become an important consideration in the resource planning process, low environmental cost (green) resources become more important. The ability to move these green resources to the load centers would be expanded with the addition of the SWIP.

The second test is the consumer benefit test. Utilities must demonstrate to their regulators that a transmission line would reduce the total costs, thereby benefiting the consumers. Once the project (i.e., the SWIP) is permitted, utilities may then begin including the project in their least cost plans. When and if a sufficient number of utilities have demonstrated the cost effectiveness of the project to their regulators, those project participants would move the project forward (i.e., implement that part of their least cost plan).

Generation vs. Transmission

When utilities consider whether to jointly build generation and share it via transmission, or build redundant plants in their respective service territories, they must consider:

- power plant construction cost
- transmission line construction cost
- the extent to which generation can be shared because of regional diversity
- transmission energy losses

For example, if we assume that a power plant is needed for summer air conditioning in the Southwest, and in the winter needed for light and heat-related loads in the Northwest, there is potential for sharing a generating station.

"Despite the progress of the last 10 years, the region enters the 1990s without the capability to successfully run conservation programs in all sectors of the economy and without an inventory of resources that can be developed quickly. Even with moderate growth, the region will need an additional 2000 MW by the turn of the century. Of all the options the region faces, inaction would expose the people and the economy to the greatest risk." (Northwest Power Planning Council, 1991).

In response to this, northwest utilities are soliciting proposals for new generating stations and conservation projects during the 1990s. The Idaho Power Company (IPCo) is sponsoring conservation programs and constructing power plant enhancements. California and Nevada utilities are taking similar actions. Desert Southwest utilities anticipate similar requirements later in the decade.

There is wide recognition in the electric utility industry that new transmission would make the best use of the scarce capital available for resource development by providing for the sharing of resources. There are new transmission projects proposed and being built to provide additional capacity between the Northwest and California, and between the Desert Southwest and California. The SWIP would increase the capacity between the Northwest and Southwest. That interconnection is important to extend the cost savings of transmission to the West.

Construction Costs

As part of their least cost planning, utilities routinely examine the average cost of bringing additional capacity into their systems. Least cost options are determined, in part, by evaluating the cost per kilowatt for various resources:

- a coal plant costs approximately $1200 per kilowatt
- a natural gas plant costs approximately $600 per kilowatt
- conservation may cost approximately $900 per kilowatt (conservation in one region can free resources to supply another region in lieu of new generation)
- transmission costs approximately $300 per kilowatt (assume 500 miles at 1200 MW capacity is approximately $360,000,000)

Note: These numbers are conceptual order of magnitude estimates and do not reflect any particular project costs.

Using these examples: (1) a coal generating station with one fourth (300/1200) of its output shared between regions would justify transmission, rather than building plants in two locations, (2) a natural gas plant with one half (300/600) of its output shared would justify transmission, and (3) the transmission would be justified if it would free one third (300/900) of the energy saved from conservation for use in another region.

Losses on a transmission system of this distance are typically 4 percent to 6 percent of the energy transmitted. The cost of losses would adjust the above ratios to determine whether the transmission was justified.

Transmission System Reliability

The WSCC is an organization of utilities throughout the western U.S. that was organized in August 1967. It establishes reliability criteria and provides the coordination which is essential for operating and planning a reliable and adequate electric power system for the western part of the continental U.S., Canada, and Mexico.

Due to the vastness and diverse characteristics of the region, WSCC's members are faced with unique and challenging problems both in coordinating the day-to-day interconnected system operation and the long-range planning needed to provide reliable and affordable electric service to more than 59 million people in WSCC's service territory.

It has become apparent to the WSCC and its member utilities that the bulk power system in the western U.S. and parts of Canada has evolved into a highly integrated interconnected system.

The SWIP would significantly improve the reliability of the regional power system. A WSCC study indicated the potential for voltage instability in several areas under transmission or generation outage conditions during peak demand periods. Voltage instability can result in the uncontrolled loss of customer load. Steps are being taken to mitigate the problem by installing new transmission equipment and interconnecting segregated systems, like the Intermountain area, to more stable regional systems. The SWIP would directly reinforce the Intermountain area which would improve system reliability and reduce the likelihood of isolating areas from the regional system. It would provide additional transmission capacity to help support the electrical integrity of the western system in the event of the loss of critical generation or transmission facilities.

By interconnecting the SWIP and the Utah-Nevada Transmission Project (UNTP), the SWIP Crosstie (hereafter referred to as the Ely to Delta segment) would provide an alternative path if either transmission line were curtailed due to scheduled or unscheduled outages. This would allow for optimal transfer capability ratings for the SWIP and the UNTP systems. The resulting interconnected system would have a larger transfer capacity than would be possible if these projects were not interconnected.

The total electrical strength of all ties between the northern and southern portions of the transmission system in the West would significantly increase with the construction of the SWIP. This would reduce the potential for and the severity of electrical disturbances during operating emergencies. Reliability would be increased by providing an additional transmission path between Idaho, Nevada, and Utah. The geographical and electrical separation between existing north-south transmission facilities and the SWIP would be substantial. This separation would increase system reliability by reducing the portion

of all major north-south ties that can be disrupted by a single event, such as an earthquake, storm, or vandalism.

Regional Economic Benefits of the SWIP

Capturing current and future efficiencies within the electric power system of the western United States would provide regional economic benefits. Interconnecting the systems of the Northwest and Southwest with firm transmission access via the SWIP's proposed "open marketplace" concept would allow the regions' utilities to realize these efficiencies. Open access to other regions would facilitate creative energy transactions which, driven by the forces of the open market, would take economic advantage of the load and resource diversities between the regions. Energy transactions between interconnected utilities would better use existing internal transmission capacity. These transactions would benefit the wheeling utility by creating revenues that can be applied against its internal system costs, including seasonal exchanges, resource coordination, nonfirm sales and purchases, firm sales and purchases, and reserve sharing. Interconnections between utilities would also provide other benefits including improved system reliability and environmental enhancements.

The addition of the SWIP would allow utilities in the Northwest and Southwest to add capacity and reliability to the western electrical system at an economical price. Specifically, the SWIP would fulfill the major needs as outlined below:

Seasonal Exchanges

Seasonal exchanges provide benefits by taking advantage of the load pattern diversities between regions. By directly interconnecting and exchanging power between the winter peaking Northwest and the summer peaking Southwest, both regions would benefit from increased operating efficiencies of existing resources. Seasonal exchange transactions could reduce operating expenses through fuel diversity, as well as reduce capital cost expenditures by deferring costly new generating resources.

The SWIP would allow the Northwest, the Southwest, and the Intermountain areas to take advantage of the various load pattern diversities including variations in electrical demand and supply within the region. The Ely to Delta segment would create an additional bi-directional transfer path between the Northwest and the Intermountain regions of the West. Currently, these areas are interconnected only by lower voltage transmission lines with limited electric load-carrying capability. It would also create an additional bi-directional transfer path between the Intermountain area and the Southwest including southern Nevada. This is an area that is rapidly growing and is in need of additional energy and capacity resources to serve its native load.

Resource Coordination

The SWIP would enable regional resources with diverse generating characteristics to operate jointly in a manner that increases overall operating efficiencies. For example, the Northwest could use the surplus peaking capacity and storage capability of its hydro system in conjunction with the base loaded thermal resources of the Southwest, thus increasing load-carrying capability as well as reducing

production costs. Resource coordination agreements, like seasonal exchanges, benefit the utilities by both reducing operating expenses and potentially deferring new generating resources.

Nonfirm Sales and Purchases

Nonfirm sales and purchases provide benefits by lowering the total power production expenses of the parties involved. Nonfirm or economy transactions accomplish this by taking advantage of the diversity in incremental production costs between generating resources, such as displacing oil resources with coal resources or displacing coal with hydro. The purchasing party benefits from lower production expenses than it would have otherwise incurred, while the selling party benefits from the revenues received that are in excess of its incremental production costs. Nonfirm transactions are generally short-term in nature, ranging from the next hour to several months, since incremental costs are very sensitive to the uncertainty of future load requirements, generating unit availability, and fuel costs or availability, such as spot gas prices or winter snow pack.

Firm Sales and Purchases

Firm agreements tend to be longer in term and place a higher level of obligation on both parties. As such, they are included in the utility's long-term planning process. The economic benefits derived from firm sales and purchases are therefore somewhat broader than those of the nonfirm market. Firm transactions benefit the purchaser by deferring large capital outlays associated with the acquisition of a new generating resource. They benefit the seller by sharing the output and the fixed costs of an existing resource until such time as the seller can fully utilize the resource.

Reserve Sharing

Reserve margin is generating capacity that must be available to respond to emergency conditions. Additional transmission capacity between the Northwest and Southwest would enhance the utilities' abilities to meet these reserve margin requirements by using the load and resources diversities that exist between regions. Thus, reserve sharing would benefit the utilities by optimizing the existing and future regional resources in meeting reserve margins.

Existing and Future Generation

Utilities attempting to reduce their need for new generation construction look to existing generating stations with surplus capacity. Many of these plants, designed for forecasted demands that were not realized due to shifts in growth and energy conservation efforts, are oversized for current demand. They now provide cost-effective alternatives to new plant construction. Regional transmission access to these plants is either non-existent or constrained by systems currently loaded to capacity. The economics of pursuing transmission facilities to access regional surpluses to displace more costly generation justifies a regional intertie network necessary for cost-effective load management.

Bonanza Generating Station (Bonanza)

The Deseret Generation and Transmission Cooperative (DG&T), a Utah cooperative, has constructed and operates Bonanza, a coal-fired generating station consisting of a 400 MW unit, plus possible construction of a second 400 MW unit. The Bonanza plant has a dedicated coal mine with a dedicated rail system. The Bonanza site is approximately 7 miles northwest of Bonanza, Utah.

Nevada is uniquely positioned between Rocky Mountain and Northwest energy sources and California and Southwest consumption centers. As such, having open market substations as well as access to these stations (e.g., the Ely area) is essential in this keystone state. The Ely to Delta segment would provide a critical path for the DG&T to access these marketplace substations in Nevada where energy transactions can take place.

Intermountain Generating Station (IGS)

The IGS was constructed on behalf of a group of Utah, California, Nevada, Wyoming municipalities, rural electric cooperatives, and a privately owned company to supply their respective communities with a firm supply of electrical energy. The IGS, as proposed, was to construct and operate four 750 MW, coal-fired units, two of which are currently operational. The IGS currently supplies Los Angeles and other southern California cities with over 25 percent of their electrical energy needs over the 500kV DC transmission line.

The Ely to Delta segment would create a supplementary transmission link to the IGS which would reduce the potential for a serious electrical disturbance to the interconnected Utah electrical system. Presently, a lower voltage transmission line interconnects the IGS to the electrical system in Utah. However, this transmission line is less robust and requires a complicated remedial action scheme and relays designed to protect Utah's electrical system(s) from a DC transmission failure.

The Ely to Delta segment would also reduce the potential for, and severity of, electrical disturbances to the existing and future IGS generation units.

White Pine Power Project (WPPP)

The WPPP, although no construction dates have been scheduled, is a major option in future resource planning for the City of Los Angeles and other metropolitan areas.

The Los Angeles Department of Water and Power (LADWP), as many utilities throughout the country, has implemented conservation, load management, and customer energy efficiency programs. The LADWP has projected a deferment of 600 MW of supply-side resource requirements by the year 2000 as a result of implementing demand-side management programs. When these programs are combined with the SWIP transmission system, they would provide access to the surplus generation in the Northwest and Intermountain regions of the country. The LADWP could defer the need for major new generating plants during the next ten years.

Due to the financial risk associated with the large capital expenditures required to build new generating facilities, utilities are reluctant to commit to large new projects. The cost of the transmission system associated with generation projects is a relatively small percentage (10 to 15 percent) of the total project cost, yet the billions of dollars invested in a power plant can be held hostage awaiting transmission system permitting, approval, and construction. One factor that often impairs the ability to install new resources in a timely manner is the long lead times required to fulfill the permitting process. Therefore, these transmission lines must be assured or be in place before the decision to construct future WPPP units can be made.

CUMULATIVE EFFECTS

Anticipated Utility Projects in the Ely Area

Scenario 1 - Cutoff Route to North Steptoe/Robinson Summit

In this scenario the SWIP Ely to Delta segment would utilize the Cutoff Route. The least-impact Cutoff Route could be constructed to the North Steptoe Substation siting area and then southwest to the Robinson Summit Substation site (refer to Figure 3-2). This route would not require a substation at the North Steptoe site but would allow a potential interconnection of the Ely to Delta segment with the Midpoint to Dry Lake segment at Robinson Summit. In this scenario there would be two lines from North Steptoe to Robinson Summit.

If the environmental impacts would be assumed to be similar on the Cutoff and the 230 kilovolt (kV) Corridor Routes, as described on page 2-53 of the SWIP Draft Environmental Impact Statement/Draft Plan Amendment (DEIS/DPA), then the environmental impacts would be incrementally higher between North Steptoe and Robinson Summit because of the second line. The 230kV Corridor Route would then become the Environmentally Preferred Alternative.

If the White Pine Power Project (WPPP) is constructed there would be one additional line built from the North Steptoe area to Robinson Summit and two additional lines south from there. Neither the Midpoint to Dry Lake segment nor the Ely to Delta segment would necessarily interconnect at the WPPP, however, all three lines could be interconnected at Robinson Summit.

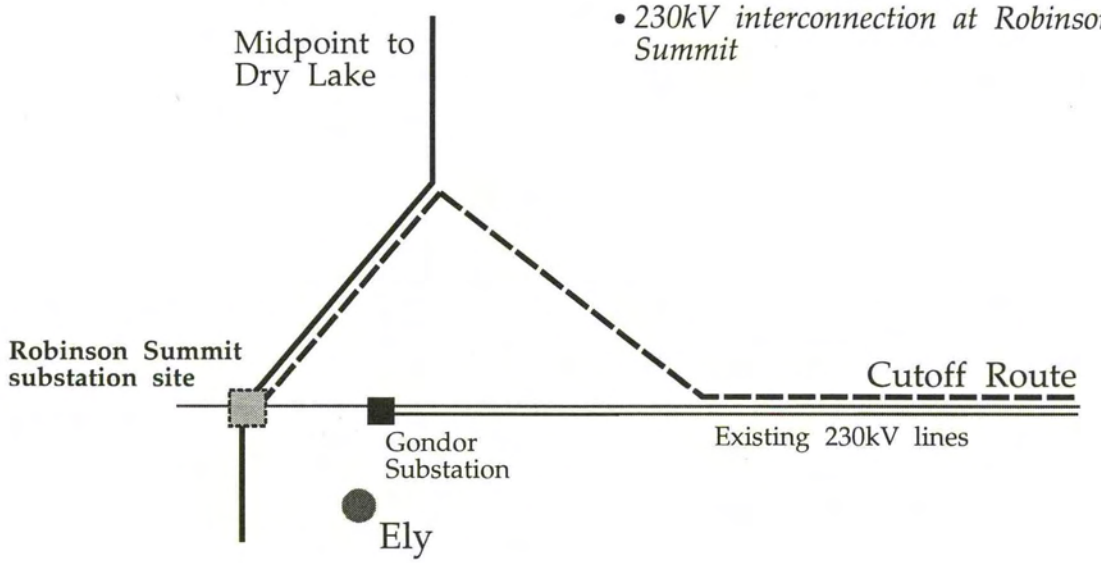
Scenario 2 - Cutoff Route to North Steptoe Substation

In this scenario the Cutoff Route would be constructed for the Ely to Delta segment and the marketplace substation would be constructed at North Steptoe. Then a 230kV line would need to be constructed from the Gondor Substation to North Steptoe to provide the future the SWIP interconnection with the 230kV system (refer to Figure 3-3). This would likely result in a 230kV line from Gondor Substation to the Robinson Summit area then paralleling the SWIP line to North Steptoe. This scenario would result in impacts similar to the Cutoff Route to Robinson Summit scenario (see above). If the 230kV interconnection occurred, again the 230kV Corridor Route would be environmentally preferred over the Cutoff Route.

If the WPPP is constructed, there could be four lines from North Steptoe to the Robinson Summit area (3-500kV lines and 1-230kV line), then 3-500kV lines south from Robinson Summit. This scenario would result in the most cumulative impacts of all of the scenarios. The only advantage of this scenario over the Cutoff Route to North Steptoe/Robinson Summit scenario (above) is that only one substation site would be needed.

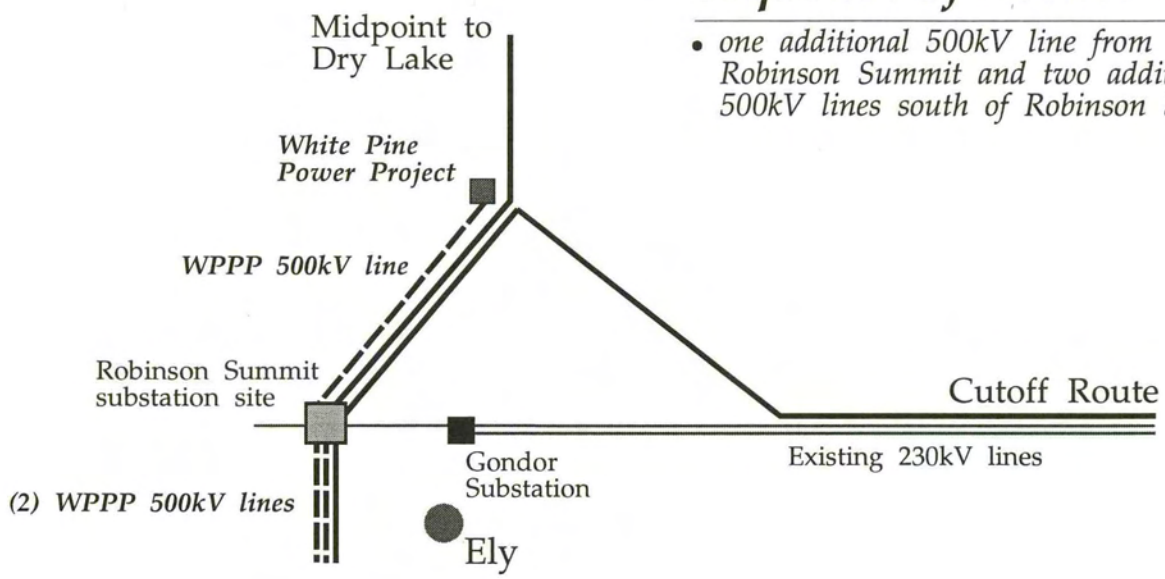
Sequence of Events

- *500kV connection of the Cutoff Route at Robinson Summit*
- *230kV interconnection at Robinson Summit*



Sequence of Events

- *one additional 500kV line from WPPP to Robinson Summit and two additional 500kV lines south of Robinson Summit.*

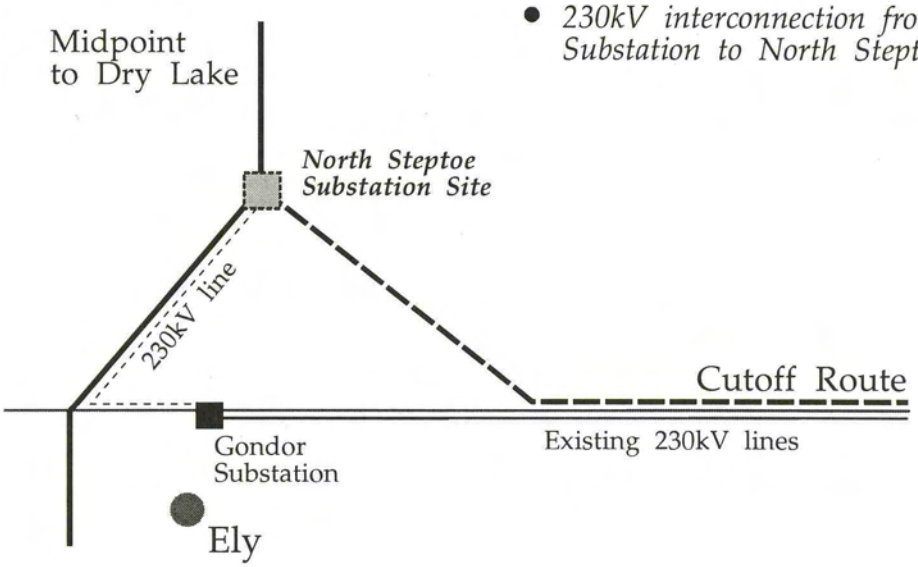


Scenerio 1
Cutoff Route to North Steptoe/Robinson Summit

Figure 3-2

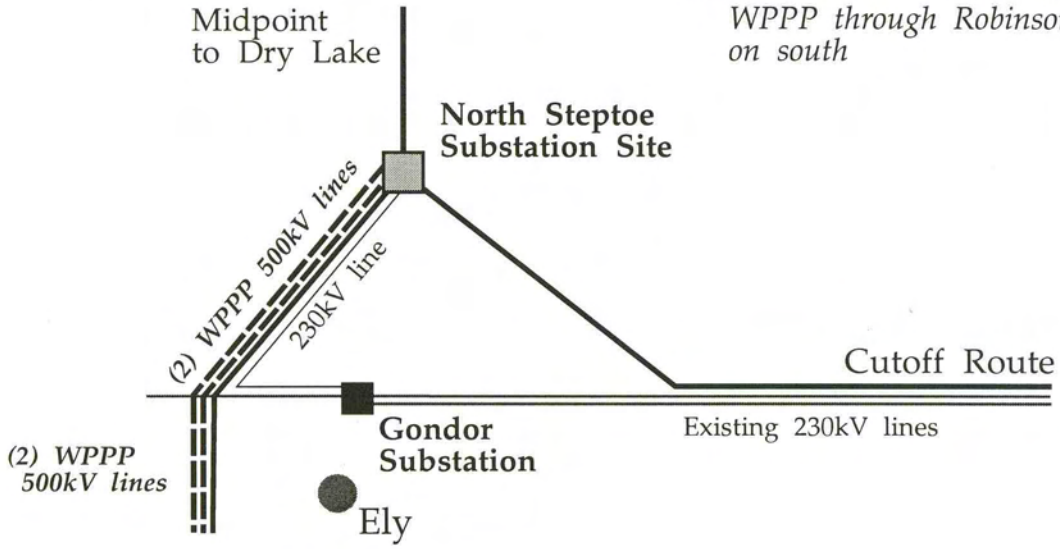
Sequence of Events

- *500kV connection of the Cutoff Route to North Steptoe.*
- *230kV interconnection from Gondor Substation to North Steptoe*



Sequence of Events

- *two additional 500kV lines from WPPP through Robinson Summit and on south*

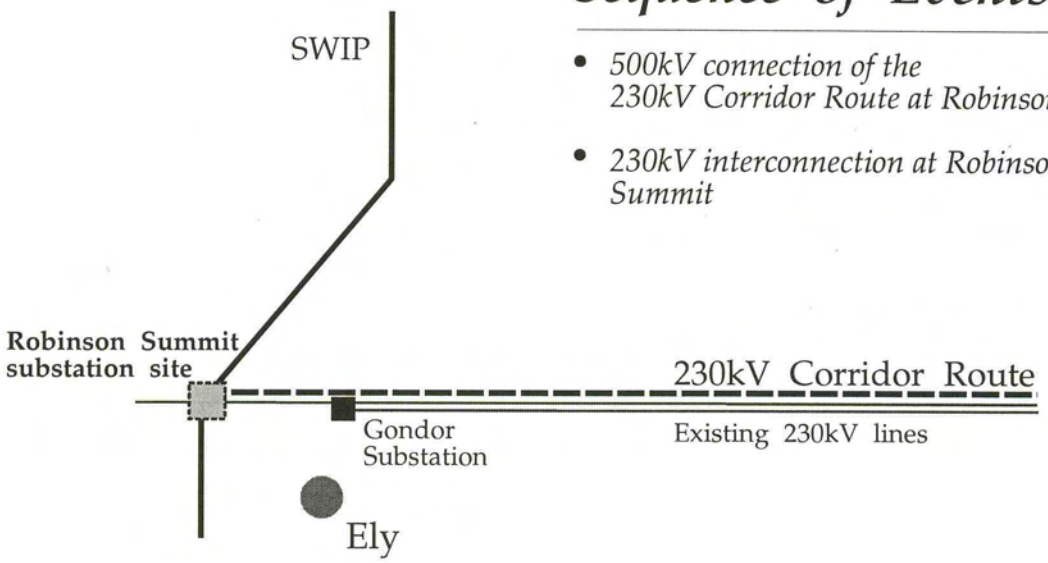


Scenerio 2
Cutoff Route to North Steptoe Substation

Figure 3-3

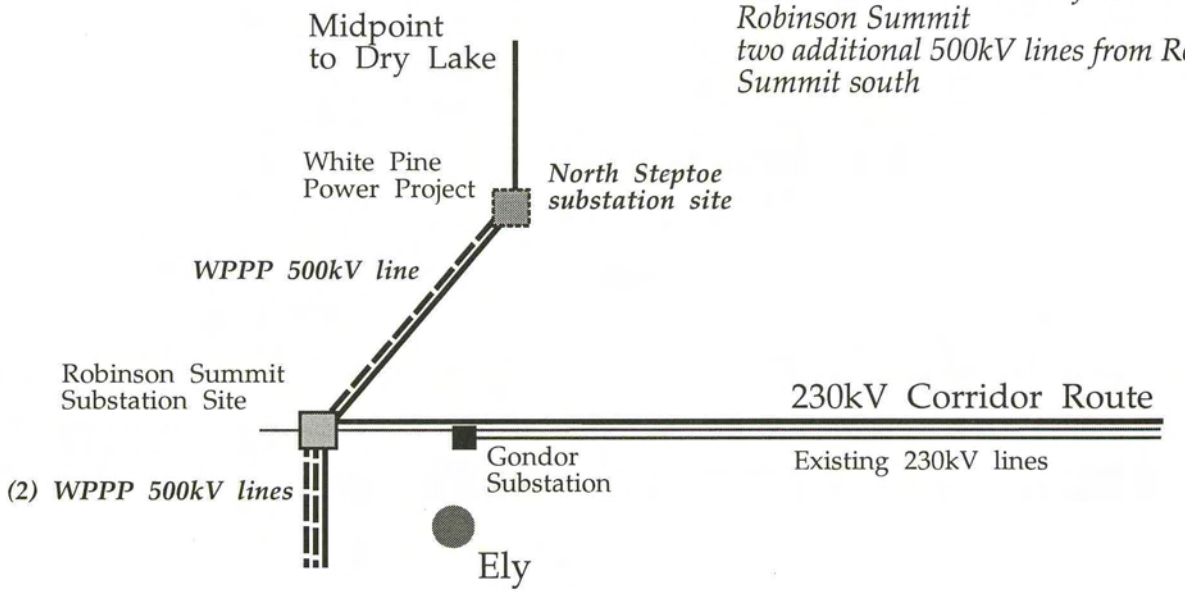
Sequence of Events

- *500kV connection of the 230kV Corridor Route at Robinson Summit*
- *230kV interconnection at Robinson Summit*



Sequence of Events

- *North Steptoe substation is constructed w/ WPPP and Midpoint to Dry Lake is interconnected.*
- *one additional 500kV line from WPPP to Robinson Summit*
  two additional 500kV lines from Robinson Summit south



Scenerio 3
230kV Corridor Route to Robinson Summit

Figure 3-4

Scenario 3 - 230kV Corridor Route to Robinson Summit

With this scenario the Ely to Delta segment would utilize the 230kV Corridor Route and the substation would be constructed at Robinson Summit where the interconnection with the 230kV system could occur (refer to Figure 3-4). If the 230kV interconnection were to occur, this scenario would have the least cumulative impacts to this point in the "buildout".

If the WPPP is constructed, the SWIP could interconnect at the North Steptoe area (at WPPP), one new 500kV line would be constructed from WPPP to Robinson Summit and two new 500kV lines would be constructed south of there. If the WPPP were constructed this scenario would cause the least cumulative environmental impacts.

Environmental Comparison of the Scenarios

The following table illustrates the environmental preferences of the expected future utility development in the Ely area.

Summary of Cumulative Effects
Environmental Preference in the Ely Area

	SWIP (Midpoint to Dry Lake and the Crosstie)	**230kV Interconnection**	**White Pine Power Project**
Scenario 1			
Scenario 2			
Scenario 3			

Environmental Preference

- **Most Preferred**
- **Second-Most Preferred**
- **Least Preferred**

The Marketplace-Allen Transmission Project

The proposed substation in the Dry Lake area would be the southern terminus of the SWIP. In 1990 the BLM asked the Idaho Power Company (IPCo) to help coordinate the transmission needs of utility companies with new transmission facilities planned in southern Nevada, particularly those needing transmission access to the McCullough Substation area located south of Boulder City, Nevada. The regional utilities developed a corridor concept which would maximize the capacity of the corridor while minimizing environmental impacts. Subsequent discussions with the Nevada Power Company (NPC) and other utilities resulted in the Marketplace-Allen Transmission Project (MAT) project, which is planned to be proposed to the Nevada Public Utility Commission in July 1993 by NPC. This approximately 53 mile project would connect the proposed SWIP substation in the Dry Lake area to a new marketplace substation in the McCullough Substation area. Two high capacity 500kV transmission lines would connect the two substations of the "open marketplace". The combined capacity of over 3000 megawatts (MW) would allow utilities to interconnect at either substation and conduct transactions.

Although the MAT would be operated by NPC, several other regional utilities would likely be participants in the project. The purpose and need for the MAT would be to provide a major electrical interconnection point for the Inland Southwest, with connection points on its north end (i.e., the proposed Dry Lake Substation site) and south end (i.e., the proposed marketplace substation near McCullough Substation). This project would also provide capacity for NPC's internal system needs. The combined capacity rating of over 3000 MW would be possible because of the relatively short distance between the two proposed marketplace substations. The high capacity of this system would allow the planned transmission lines to connect on either end, while minimizing the number of lines through this sensitive area. The MAT is proposed to be in service in 1997.

There are two major potential routing alternatives for this project. The first would run straight south through the Apex development parallel to the proposed Utah-Nevada Transmission Project 500kV line, then cutting southeast to the Gypsum Wash area, and then south through the Sunrise Mountain and Henderson areas. The second major routing alternative would cross Interstate 15 at the north end of the Dry Lake range and run straight south paralleling the Intermountain Power Project (IPP)-Adelanto 500kV Direct Current (DC) line and the Navajo-McCullough 500kV line to the Sunrise Mountain and Henderson areas.

The SWIP's southern connection to the proposed Dry Lake Substation would require an interconnection with the proposed marketplace substation. The Notice to Proceed for the construction of the SWIP, from Ely to Dry Lake, would be contingent on the approval of a transmission facility between the Dry Lake Substation and the proposed marketplace substation. The Marketplace-Allen Transmission Project (MAT) has been proposed by Nevada Power Company to meet this and other interconnection needs.

The SWIP may be built in phases if market or financial conditions warrant. The portion of the SWIP from Midpoint Substation to Ely (Midpoint to Dry Lake segment) may be the first phase developed.

Also refer to the Cumulative Effects section in Chapter 4 of the SWIP DEIS/DPA.

Potential Fiber Optic Ground Wire

To protect conductors from direct lightning strikes, two overhead ground wires, 3/8 to 1/2 inch in diameter, would be installed on the top of the towers. Electrical current from lightning strikes would be transferred through the ground wires and structures into the ground. There is an opportunity to install ground wire with fiber optic capability to serve the needs of commercial communication companies rather than traditional ground wire. Further, the fiber optic ground wire could also be used to supplement the communication needs of the SWIP. However, the planned microwave communication system would be the primary communication system.

If installed, access to the fiber optic ground wire by a commercial communications company would only be allowed upon completion of all environmental permitting activities (e.g., NEPA) and obtaining the right-of-way. Regeneration stations, which are typically small concrete buildings approximately 10 feet by 10 feet, would be needed at 20-40 mile intervals along the transmission line right-of-way. They would likely be placed on or immediately adjacent to the SWIP right-of-way.

Similar to the conductors, ground wire would be strung using powered pulling equipment at one end and powered braking or tensioning equipment at the other end of a conductor segment as shown on Figure 2-5 in the SWIP DEIS/DPA. Sites for tensioning equipment and pulling equipment would be approximately 2 miles apart. If a fiber optic ground wire is installed rather than conventional ground wire, the construction methods would be the same. The appearance of a fiber optic ground wire is the same as conventional ground wire. The regeneration stations would likely cause insignificant visual impacts.

ADDITIONAL STUDIES AND INFORMATION

Analysis of the No-Action Alternative

Information and analysis about the No-Action Alternative is presented here as a supplement to the section analyzing the No-Action Alternative in Chapter 2 of the SWIP DEIS/DPA on pages 2-10 and 2-11. Within this section the potential impacts associated with No-Action are assessed.

Biology

Selection of the No-Action alternative would have the effect of creating no project related impacts to biological resources in the States of Idaho, Nevada, or Utah. Impacts that would not occur under this alternative are varied and include short and long term losses of habitat to a wide array of wildlife species resulting from construction roads and disturbance at tower sites and ancillary facilities (e.g., line pulling and tensioning sites and equipment storage yards). In addition to short term impacts to wildlife, some populations of rare plant species would not be affected under this alternative.

Long term impacts, both direct and indirect, that would be avoided under the No-Action alternative include permanent commitment of small amounts of wildlife and plant habitat to transmission line tower footings, potentially increased OHV use along transmission line roads (even after closure of such roads), a potential for limited bird mortality resulting from collisions with conductors and static lines, and creation of hunting or nesting sites for predatory bird species.

In southern Nevada, the federally listed desert tortoise would suffer no direct impacts from short or long term disturbance of habitat, no permanent loss of habitat to transmission line tower footings, and no harassment, injury, or mortality from construction-related activity. Potential indirect benefits of this alternative include no project-associated, unintended, increases in public access to tortoise habitat or from activities associated with operation and maintenance of the transmission line. Impacts from increases in public access could include further habitat degradation from unauthorized off-road vehicle activity, direct mortality from tortoises being crushed by vehicles, increased mortality from vandalism (e.g., shooting of tortoises), and increased illegal collecting of tortoises for pets.

In northern Nevada, and to some extent, southern Idaho, the No-Action alternative would provide both direct and indirect benefits to local populations of sage grouse. Although it is likely that direct impacts to crucial sage grouse wintering and strutting areas can be avoided by judicious tower placement, there may be some impact to these habitat features. The primary indirect benefit to sage grouse from this alternative would be that transmission line towers would not be present to provide hunting perches for golden eagles, or other birds such as ravens, to prey on sage grouse during particularly vulnerable segments of their life cycle.

The No-Action alternative may also result in indirect benefit to big game species. In the absence of the project, individual pronghorn antelope, mule deer, bighorn sheep, and elk may realize net benefits through no increases in the potential for human access to habitat areas used by these species at various times of the year. However, the No-Action alternative may not result in measurable benefit to regional populations of these species.

The No-Action alternative may also result in no net benefit accruing to some species and result in a scenario that is reflected by the currently existing environment. The introduction of transmission line towers into some areas may provide nesting and hunting sites for some species (e.g., some species of hawks) where none currently exist. Conversely, the No-Action alternative may be of benefit to individual birds of prey inasmuch as perched birds and nests on transmission line towers are highly visible, making them more vulnerable to illegal shooting by humans.

Some particularly sensitive habitats and the wildlife and plants that occur there (e.g., the Leland Harris spring complex in Juab County, Utah) may realize beneficial indirect effects from this alternative. In the case of the Leland Harris springs, most notable would be the absence of any project related impacts to the springs and wetlands associated with them. Secondary, indirect beneficial impact may accrue to this area by virtue of the entire planning process for this project, which has brought heightened attention to the degraded nature of the existing environment at this sensitive site.

Cultural Resources

The No-Action Alternative would result in continued management of cultural resources in accordance with current agency programs. No intensive surveys would be undertaken along an approved construction corridor and most of the estimated 200 to 400 cultural resources likely to be present probably would not be discovered and recorded in the near future. None of these resources would be affected by the transmission line construction activities, nor would the setting of these resources be altered by introduction of a new transmission line. No archaeological or historical studies would be undertaken nor would other types of measures be implemented to mitigate the impacts of constructing the proposed transmission line. The public accessibility of the region would not be enhanced by construction of access roads and therefore cultural resources are unlikely to be threatened by increased vandalism or inadvertent damage as a result of more visitation.

The No-Action Alternative would be similar to the Existing Environment (refer to Chapter 3 of the SWIP DEIS/DPA.

Visual Resources

The No-Action Alternative would not alter the Visual Resources beyond that already described in the existing environment (refer to Chapter 3 of the SWIP DEIS/DPA).

Land Uses

The No-Action Alternative would not affect present land uses as described in the existing environment in Chapter 3 of the SWIP DEIS/DPA.

Soils/Geology/Paleontology

The No-Action Alternative would not alter the Soils/Geology/Paleontology beyond that already described in the existing environment (refer to Chapter 3 of the SWIP DEIS/DPA).

Recreation Resources

The No-Action Alternative would not create any additional recreation access beyond that already described in the existing environment (refer to Chapter 3 of the SWIP DEIS/DPA).

Wilderness/WSAs

The No-Action Alternative would not alter the Wilderness/WSAs beyond that already described in the existing environment (refer to Chapter 3 of the SWIP DEIS/DPA).

Electric and Magnetic Field Effects

The No-Action Alternative would not alter the Electric and Magnetic Field Effects beyond that already described in the existing environment. Refer to Table 4-5 and 4-6 in the SWIP DEIS/DPA for a comparison of Electric and Magnetic Field Effects that currently exist with Electric and Magnetic Field Effects that would exist if the SWIP were constructed, also refer to Chapter 3 of the SWIP DEIS/DPA.

Socioeconomics

With the No-Action Alternative the cost of power may be increased within the western U.S. over time because of the inability for the utilities to implement least-cost planning alternatives (i.e., the SWIP). The tax bases of the counties under the No-Action Alternative would be the same as the existing environment, refer to Table 4-4 in the SWIP DEIS/DPA and Chapter 4 page 4-14 of the SWIP FEIS/PPA for a description of estimated county tax revenues that would be foregone by county residents if the SWIP is not constructed (refer to Chapter 3 of the SWIP DEIS/DPA).

Grazing

For grazing lessees the No-Action Alternative would be an adverse impact because of less access for rangeland purposes. It would also be a beneficial impact to the lessee because the No-Action Alternative would also provide less access onto rangeland by the public, and therefore less disruption to grazing operations, less chance of vandalism, and less chance of harassment of domestic livestock.

Recent EMF Research Results

Additional information has been provided on electromagnetic field (EMF) research which has been published since the SWIP Draft Environmental Impact Statement/Draft Plan Amendment (DEIS/DPA). For a complete discussion of EMFs, please refer to the Chapters 3 and 4 of the SWIP DEIS/DPA.

In September 1992, two Swedish residential and occupational EMF studies were released. One case-control study investigated cancer in both children and adults living near high voltage transmission lines in Sweden during a 25-year period. The Swedish researchers found a weak association between historical EMF exposure and leukemia in children, but could find no evidence of an increased risk for adults. The occupational study's results showed a modest association for both leukemia and brain tumors in adults who had occupational exposures to EMFs. The researchers concluded that the results of the studies provide some support for an association between EMF and cancer development.

In October 1992, the Danish Cancer Registry released preliminary results from their own EMF studies. They paralleled their Swedish colleagues with one childhood and one occupational study. Their findings, however, did not support those of the Swedish study. For childhood leukemia, the Danish study results do not support a conclusion of an elevated risk from EMF exposure. Nor was a leukemia exposure-response trend evident. The occupational study, on the other hand, reports an increased risk of leukemia in working adults exposed to continuously elevated EMFs. The reason for this increase is not clear. In addition to magnetic fields, other factors may also be present in the work environment.

The Electric Power Research Institute (EPRI) has analyzed the Swedish studies and finds that they contain important new information and innovative measurement techniques that better identify the exposure variables. The Swedish studies are also consistent with other studies that have found a correlation. However, there are weaknesses. In the residential study, there was a relatively small number of cases that estimated the leukemia risk, making it difficult to draw statistically significant conclusions. Additionally, the long term exposure tracked over the 25 year period necessitated estimations that did not take into account possible exposures from other sources. The Swedish occupational study, however, did adjust for exposures to various other environmental factors. The Edison Electrical Institute (EEI) also notes that although the studies were credible and thoroughly researched, they were incomplete and showed no definite link between EMFs and cancer.

Right-of-Way

Right-of-Way Width Requirement and Grounding

A right-of-way width of 200 feet is required to accommodate the conductor blowout (i.e., swinging of the conductor midway between towers) due to wind, guy wires and anchors, and maintenance clearances at the tower sites. All power lines produce EMFs. These fields produce static charges on conductive objects within a certain distance from the line. The amount of charge depends on the conductive object's size, shape, and orientation to the line. These static charges can be eliminated by either using nonconductive materials or by grounding the conductive objects that would be of sufficient size to produce a charge. Buildings or structures with conductive surfaces located outside of the right-of-way, but within 200 feet of the assumed centerline, would be grounded. Buildings or

structures beyond 200 feet would be reviewed in accordance with the National Electric Safety Code (NESC) to determine grounding requirements.

The NESC requires grounding "as one of the means of safeguarding employees and the public from injury that may be caused by electric potential." The grounding standards of the Idaho Power Company (IPCo) exceed the NESC requirements. IPCo grounds all buildings, fences, and other structures with metal surfaces located within 200 feet of the assumed centerline of transmission lines. Typically, residential buildings located 200 feet outside the assumed centerline would not require grounding. The IPCo also grounds all metal irrigation systems that parallel a transmission lines for distances of 1000 feet or more within 100 feet of the assumed centerline. If grounding is required outside the right-of-way, a temporary use permit or landowner consent would be obtained as necessary. Grounding of fences, buildings and other structures would be fully detailed in the SWIP Construction, Operation, and Maintenance (COM) Plan.

Right-of-Way Separation between the SWIP and the UNTP

Where the SWIP would parallel the proposed Utah-Nevada Transmission Project (UNTP), the rights-of-way of the two transmission systems would need sufficient separation to meet reliability and outage criteria of the Western States Coordinating Council (WSCC) (also refer to the transmission system reliability section in the updated Purpose and Need in this chapter and to page 1-2 of the SWIP DEIS/DPA). Without adequate separation the criteria considers the simultaneous outage of the SWIP and the UNTP to be a credible event or an event that has a significant likelihood of occurring. The simultaneous loss of the SWIP and the UNTP under heavy transfer conditions could precipitate a major electrical system disturbance resulting in a cascading failure of the western power system. Building and operating the system in this manner would be inconsistent with the WSCC reliability criteria.

The projects must (1) reduce capacity (which has the effect of rendering one project economically impractical), (2) provide measures to avert system breakup (considered technically and economically impractical), or (3) construct the projects so a simultaneous outage is not credible (e.g., use adequate circuit separation). While the latter course is preferable to the project participants, the specific amount of separation required to achieve this determination has not been defined in the criteria. However, based on the terrain and environmental considerations in the area of parallel right-of-way, it is believed that 2,000 feet would be adequate.

Each right-of-way evaluation or request within the WSCC system should consider the specific line combinations to determine whether a specific separation is required. The issue is the credibility of a simultaneous loss of the circuits involved. The WSCC criteria state:

> "the credibility of loss of a particular set of lines will depend upon the total distance of common corridor shared by the lines and upon the vulnerability of the circuits over that distance to a common mode failure. Considerations for this vulnerability assessment will include line design, length, location, whether forested, agricultural, mountainous, etc., outage history, operational guides, and separation. For example, some utilities use separation by more than the span length as adequate to designate the circuits as being in separate corridors."

This issue is not new. For example, the Third Pacific 500kV AC Intertie requested and received miles of separation between it and the existing two 500kV interties in forested areas. This separation was

required to allow adequate response time to adjust the system following the loss of the existing lines and a potential loss of the third 500kV line. Similar to the SWIP and the UNTP, the consequences of such an outage would be wide spread outages in the WSCC system. Without this separation, that project probably would not have been feasible.

The reason for separating the SWIP and the UNTP lines is to meet the WSCC reliability criteria for regional transmission facilities. Placing these lines closer together or on the same double circuit tower could result in a considerably lower capacity rating that would render the projects economically infeasible. The capacity rating of the SWIP line would not be permitted if the project developer does not comply with WSCC separation requirements.

Double circuit towers or a separation of less than 2,000 feet would exist in isolated areas along the route due to terrain or land use conflicts (e.g., Pahranagat Wash). These transmission towers would have to be designed with a safety factor that is several more times redundant than would be otherwise necessary. The project developer hopes that the WSCC would be willing to allow the 1200 MW rating with these design concessions for a short distance (i.e., less than 1 percent of the total line length).

The SWIP and the UNTP would converge near Robber's Roost Hills (Link 675 - milepost 12), and would be parallel for 88.5 miles (Links 690, 700, and 720 - milepost 15) into Coyote Spring Valley in southern Nevada, where the UNTP would continue south and the SWIP would cross through the southern end of the Arrow Canyon Range into the Dry Lake Valley. A separation of 2,000 feet would be needed for this entire distance except where it is not physically possible to maintain this separation.

In the Pahranagat Wash area, the SWIP and the UNTP lines may need to be closer than 2,000 feet for two miles or more. Because the Delamar Mountains and Evergreen Wilderness Study Areas (WSAs) are within about 1/2 mile of each other and other linear features are present (e.g., U.S. Highway 93 and the Lincoln County Coop 69kV line), the SWIP and the UNTP lines would each be constructed on double circuit towers, with one circuit left open. The plan is for the two future WPPP lines to be placed on the open circuits of the SWIP and the UNTP lines through this area. The proposed configuration of the planned lines through this area is shown schematically in the cross-sections included in the Map Volume accompanying the SWIP DEIS/DPA. To help compensate for this lack of separation and to meet the WSCC criteria outlined above, the structures within this area would need to be engineered to a higher standard to better withstand potential physical disturbances (e.g., earthquakes, etc.). Refer to Cumulative Effects section in Chapter 4 of the SWIP DEIS/DPA.

If the Delamar and Evergreen WSAs are not designated as Wilderness by Congress by the time all of the lines are constructed, the involved utilities may pursue amending the right-of-way grants to allow all of the lines to be placed on separate circuits.

In the 88.5 miles where the SWIP and the UNTP lines would be separated by 2,000 feet, the SWIP and the UNTP lines would form the outside edges of the utility corridor that would include the two planned 500kV WPPP transmission lines. The cross-sections in the Map Volume accompanying the SWIP DEIS/DPA schematically show the relationship of the four planned 500kV transmission facilities. Refer to the Cumulative Effects section in Chapter 4 of the SWIP DEIS/DPA. The involved regional utilities will coordinate with the Las Vegas District of the BLM on the final configuration of this corridor.

Where the SWIP would not parallel the UNTP line, a minimum separation of 200 feet from other transmission facilities, centerline to centerline, would be required (i.e., for some facilities the rights-of-way could be side by side). With this separation, if either the SWIP or the lower voltage line failed, neither would fall into the other.

Military Air Space

In a comment on the SWIP DEIS/DPA, the National Park Service (NPS) requested additional information about the significant potential impacts of the alternative routes on military airspace. This section describes Federal Aviation Administration (FAA) regulations and agreements, the Air Force's concerns for the SWIP alternative routes, and the potential impacts of each alternative route on flight operations and military airspace.

The SWIP would affect two of the largest flight training areas in the West: the Utah Testing and Training Range (UTTR) of Hill Air Force Base (AFB) and the Desert Military Operating Area of Nellis AFB. Each of these ranges have a series of military operating areas (MOAs) where a large variety of low-level flights are conducted for combat training maneuvers and exercises.

Flights in these areas are conducted under visual flight rules (VFR) to provide low-attitude navigation and radar-simulated combat exercises (FAA Order 7610.4, Special Military Operations). Because of the low-level high-speed nature of the flight operations in MOAs, surface structures (e.g., radio towers, transmission line towers, etc.) present significant potential danger to pilots and aircraft, particularly when altitude ceiling and visibility conditions are impaired. Although flight operations can be altered to avoid the potential hazards of transmission line facilities, the low-altitude training operations are a pre-existing use of the airspace (FAA Part 77, 7400.2C Procedures for Handling Airspace Matters, 1984). FAA procedures state that when proposed structures that exceed the obstruction standards are being sited and the military has determined the alternative would be detrimental to their flight operations, an attempt to persuade the project sponsor to lower or relocate the alternative should be identified by the military (7400.2C Procedures for Handling Airspace Matters, Chapter 7 - Evaluating Aeronautical Effect).

Military Operating Areas and Restricted Areas - The Military has negotiated agreements with the FAA to set aside special airspace areas to contain flight activities that, because of their nature, may impede other aircraft operations that are not part of those activities. These airspace areas, called MOAs and restricted areas, establish positive control area to separate certain non-hazardous military activities from instrument flight rules (IFR) traffic (e.g., conventional commercial aircraft) and to identify for VFR traffic (e.g., small aircraft) where these military activities are conducted (7400.2C Procedures for Handling Airspace Matters, May 1, 1984). Military activities can include air intercepts, supersonic flight, acrobatic maneuvers, air combat exercises, and other flight training. Restricted Areas and MOAs contain these activities and prevent non-participating aircraft from being affected or interfered with during military operations.

Military airspace is divided into two categories: those that involve rulemaking actions and those that involve non-rulemaking actions. Rulemaking actions relate to the assignment, review, modification, or revocation of airspace by a rule, regulation, or order as prescribed in the Federal Aviation Regulations (FAR Part 11). Restricted Areas fall into this category. Because an agreement between affected military units, FAA representatives, and jurisdictional owners or administrators (e.g., the BLM) is required, it is difficult to amend and/or change the operation plans in these areas. Non-rulemaking

areas include MOAs, firing areas, and alert areas where the FAA has the authority to make the final decision but does not render that decision by issuing a rule, regulation, or order (7400.2C Procedures for Handling Airspace Matters, May 1, 1984). The SWIP alternatives would pass through both categories of military airspace.

A letter of agreement between the controlling agency, the FAA, and the using agency, Hill AFB, is used to establish special airspace areas. This agreement regulates and coordinates military activities with other aircraft and private land owners and public land administrators. The controlling agency is the agency, organization, or military command whose activity the special airspace was established for when first designated.

The controlling agency will establish a MOA or restricted area as a non-joint use area, joint use area, or point source area. This designation allows the special airspace to be used or not used when all or part of the airspace is not required for its prescribed purpose or used for other purposes when missions are not taking place. To determine the useable limits of each, MOAs and restricted areas are described in terms of horizontal and (boundaries), vertical (altitudes) dimensions, the time it will be used (specified times and days of the week), and the types of activities or missions that will take place. Because of their small size, geographic location, or high degree of use, some areas are impractical for use all of the time or at all. These areas are usually termed as non-joint use. Areas that are used periodically may be termed joint use and areas that are used frequently, such as specific valleys, may be termed point source use.

Letters of agreement are signed as part of the negotiations between the controlling agency and the using agency. Agreements are necessary when military activity is to be designated below 1,200 feet above-ground-limit (AGL) and when the underlying land belongs to a private owner or is administered by a public agency other than the military. The agreements state reasonable and timely aerial access to such lands and grant the Air Force permission to fly missions over lands they do not administer. In order for the military to designate activities down to the ground surface, the proponent must either own, lease, or by letter of agreement control the underlying surface.

Affected Environment

All of the alternative routes for the Ely to Delta segment would affect restricted airspace or MOAs of the UTTR (Hill AFB) and all of the alternative routes for the Midpoint to Dry Lake segment would affect several MOAs operated by Nellis AFB.

Agreements - The are no signed letters of agreement between the BLM and the Department of Defense for the MOAs and restricted areas affected by the SWIP alternative routes. There are existing agreements between the BLM and FAA and the FAA and the Department of Defense. These agreements established the MOAs and restricted areas for Hill AFB in Utah and Nellis AFB in Nevada.

There are no regulations governing the allowed uses on the BLM-administered lands under a restricted areas or MOA. The BLM has jurisdictional rights and can permit a utility line under airspace administered by the military.

Hill Air Force Base Flight Operations - The UTTR of Hill AFB is located in northwestern Utah and extends across the state line into northeastern Nevada. The portions of MOAs in Nevada are used primarily for flight maneuvers and air combat training, as well as approaching and departing targets

located in the adjacent restricted areas of the UTTR (UTTR, 1988). Flight levels extend from 100 feet-AGL to 9,000 feet (6,500-feet Mean Sea Level (MSL). All supersonic flights are conducted under VFR during the daylight hours (U.S. Air Force, Hill AFB, 1985). Altitude floors for the Lucin A, Lucin B, Gandy, Sevier A, and Sevier B MOAs of the UTTR are set throughout at 100-feet AGL.

Hill AFB was contacted and notified of the SWIP alternative routes during the inventory. The airspace coordinator provided maps for locating Restricted Areas and MOAs and a letter expressing concerns about alternative study corridors. The portion(s) of the UTTR affected are described for each alternative route:

Delta Direct Route - This route would cross 19.5 miles in the Gandy MOA, 44.5 miles in the R-6405 Restricted Area, 12.8 miles in the Sevier A MOA, and 13.8 miles in the Sevier B MOA. Hill AFB stated that a route across the R-6405 Restricted Area would likely not be feasible. Areas of high concern were also identified along the portion of the Gandy MOA that would be affected by this route.

Cutoff Route - This route would cross 33.8 miles in the Gandy MOA, 62.5 miles in the Sevier A MOA, and 20 miles in Sevier B MOAs. Flight operations in these areas may occur down to 100-feet AGL in a joint use arena.

230kV Corridor Route - This route would cross 40.4 miles in the Sevier A MOA and 20 miles in the Sevier B MOA. Flight operations may occur in these areas down to 100-feet AGL in a joint use arena.

Southern Route - This route would cross 1.2 miles in the Sevier A MOA and 82 miles in the Sevier B MOA. Flight operations in these area may occur down to 100-feet AGL in a joint use arena.

The specific mileage of each alternative route in MOAs and Restricted Areas is listed in Table 3-1. Restricted Areas and MOAs are illustrated in the study corridors in blue and MOAs are illustrated in green on the Land Use Resources maps in the SWIP DEIS/DPA Map Volume.

As one of the largest flight training areas in the in the U.S., the UTTR is highly regarded as a valuable testing and training center and is considered very important by the Department of Defense, especially in light of the recent closing of military bases around the country by Congress.

Nellis Air Force Base Flight Operations - Nellis AFB operates several MOAs located in southern Nevada collectively called the Desert Military Operating Area. The FAA has authorized the Nellis Air Traffic Control Facility (NATCF) to govern this airspace. NATCF controls the entry and exit of military aircraft in their airspace while the Range Control Center monitors mission activities within the airspace.

Flight operations in the Desert Military Operating Area include high-speed low-level flight training maneuvers and supersonic flight exercises at or above 5,000-feet AGL. Operations may occur during daylight hours Monday-Saturday. The MOAs operated by Nellis AFB administer the airspace from the ground level to 55,000 feet.

Nellis AFB was contacted and notified of the SWIP alternative routes during the inventory. Nellis AFB is opposed to alternative routes through the White River Valley (Link 671), Dry Lake Valley

(Link 673), and Kane Springs Wash (Link 680) because of low-level flight activity and air to air intercepts exercises that occur in these areas.

In October 1990, Nellis AFB sent maps recommending specific route changes and tower height restrictions. Nellis AFB expressed a preference for a route that would turn east at a point south of the Wayne Kirch Wildlife Management Area across Cave Valley through a pass at the southern end of the Schell Creek Range (Link 672) then turning southeast across Muleshoe Valley (Link 674) toward the Bristol Range and south along the east side of Dry Lake Valley. This routing would begin paralleling the existing Lincoln County 69kV transmission line near Robber's Roost Hills (Link 675). The Caliente Resource Area of the Las Vegas District of the BLM agreed that the routing proposed by Nellis AFB should be studied. Subsequently, the described route segments were added (refer to the Panel 5 - Land Use Resources map in the SWIP DEIS/DPA Map Volume).

The individual MOAs affected by alternative routes include Reveille (Links 672, 673), Caliente West (Links 675, 690), Caliente Alpha (Link 690), and Sally Corridor (Link 690). Nellis AFB then identified "areas of high concern" along the alternative study corridors mapped during the inventory. These areas of high concern occur along portions of Links 671, 672, 673, 674, 675, 680, and 690.

The specific mileage of each alternative route in MOAs and Restricted Areas are listed in Table 3-1. Restricted Areas and MOAs are illustrated in the study corridors in blue and MOAs are illustrated in green on the Land Use Resources maps in the SWIP DEIS/DPA Map Volume.

Environment Consequences

The construction of the SWIP through military airspace in a Restricted Area or MOA would introduce a potentially hazardous obstruction across high-speed low-level flights routes used by aircraft approaching or departing targets. The Air Force has stated that maintaining their current operations with such an obstruction in the area would risk pilots and aircraft unless many low-level flight maneuvers were curtailed or otherwise altered.

The potential impacts of alternative routes on flight operations in Restricted Areas and MOAs is described below. All moderate residual impacts are considered significant.

Midpoint to Dry Lake Segment - All of the alternative routes for the Midpoint to Dry Lake segment would adversely effect MOAs operated by Nellis AFB. Alternative routes would pass through 64.7 miles of areas of high concern in the Desert Military Operating Area. To reduce the potential hazard of the transmission line towers, the AGLs of the affected MOAs would have to be raised to 200 feet. Changing the AGLs would require modifications to flight operations (e.g., exercises, flight routes, etc.) and potentially change the use designation (e.g., non-joint, joint, or point source use) of affected MOAs. Curtailed or altered flight operations could diminish the effectiveness of flight training exercises available in the Desert Military Operating Area.

The use of shorter towers was recommended as mitigation to reduce moderate initial impacts to low residual impacts. The potential application of this mitigation was negotiated with the airspace manager of Nellis AFB. However, there is no agreement with Nellis AFB to accept this mitigation. Nellis AFB did not submit comments on the SWIP DEIS/DPA.

Ely to Delta Routes - The Direct Route would result in 55.1 miles of moderate residual impacts where it would pass through the R-6405 Restricted Area operated by Hill AFB. Following a series of

meetings and correspondence, Hill AFB's airspace coordinator submitted a letter (May 22, 1991) stating the position of Hill AFB and the concerns of the Department of the Air Force regarding the four Ely to Delta routes. Hill AFB is opposed to any power line construction above 30 feet in height in the Restricted Area or would prefer the transmission line be buried. The letter cited that safety was of high concern above and below the test and training aircraft.

The other Ely to Delta routes would affect only MOAs. Hill AFB is opposed to towers above 105 feet in areas of high concern and above 154 feet in all other areas of the affected MOAs. Shorter towers (i.e., 105 feet) were recommended as mitigation within the areas of high concern following negotiations with the Hill AFB airspace coordinator. The locations of shorter towers are illustrated on Figure 3-5. Hill AFB agreed in a letter that shorter towers would be acceptable in the MOAs.

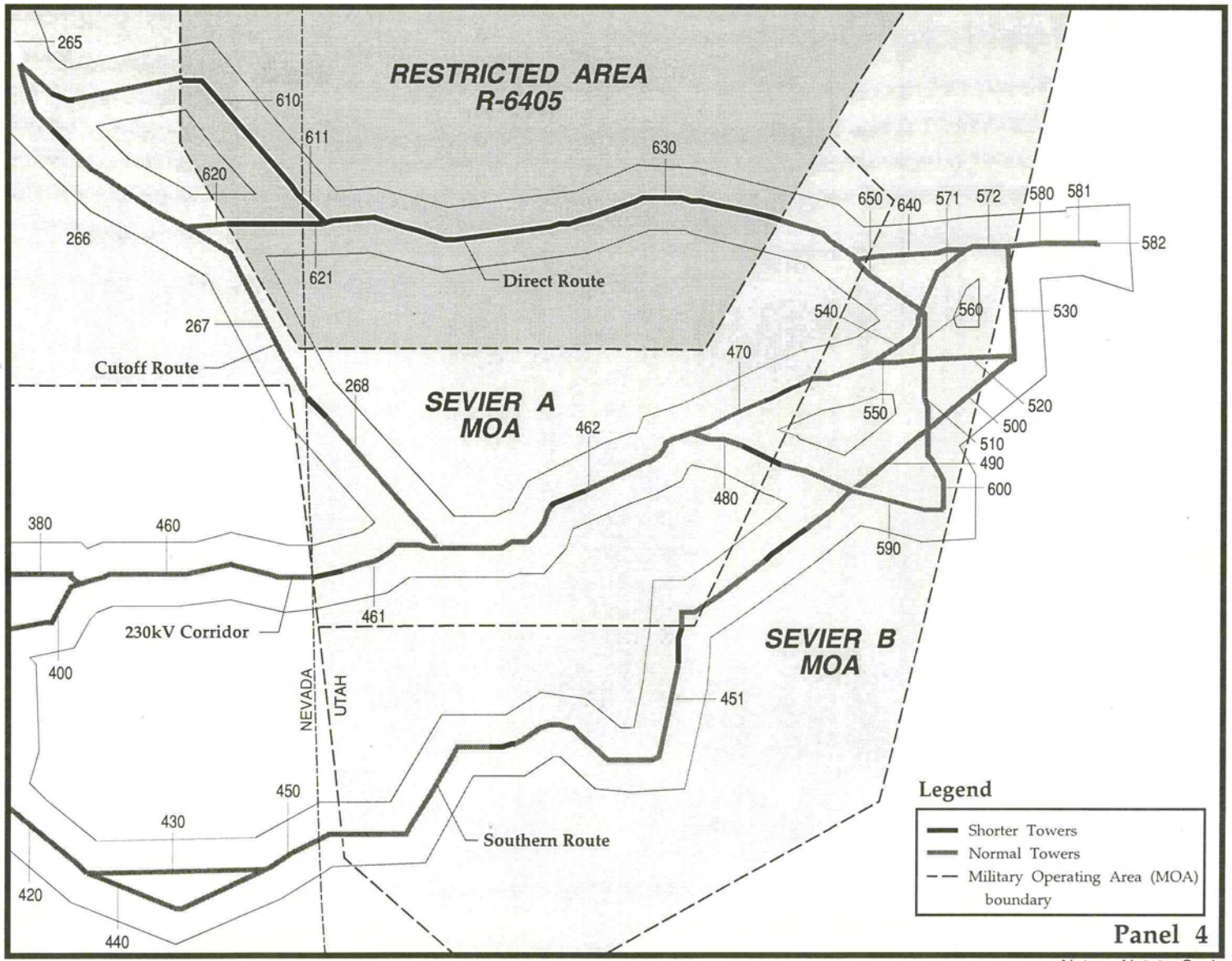
Effects to Wilderness Areas, Wilderness Study Areas, and Instant Study Areas

No wilderness areas, Wilderness Study Areas (WSAs), or instant study areas (ISAs) would be directly affected by any of the alternative routes. None of the alternative routes is expected to adversely affect the natural integrity, apparent naturalness, opportunities for solitude, or primitive recreation opportunities of wilderness or WSAs. The primary issue of concern for these areas is the potential effects (indirect) of a transmission line on the visual resource of adjacent areas.

As described under Visual Resources in the SWIP DEIS/DPA, viewpoints were identified and mapped within 3 miles of the assumed centerline of each alternative study corridor (i.e., link). No specific viewpoints (e.g., trail, vista, etc.) were identified within wilderness, WSAs, or ISAs during the inventory. Because recreation use in wilderness areas, WSAs, and ISAs is generally dispersed, views may occur from an indefinite number of potential viewpoints. And since none of these areas that fall within the study corridors have any designated viewpoints or management plans, it is not possible to estimate specific visual impacts.

Buffer zones around wilderness areas are specifically addressed in Chapter I of the BLM Handbook H-8560-1, Management of Designated Wilderness Areas under Section A.1.b. which states, "Wilderness must be viewed in context with other public lands, recognizing that no buffer zones will be created. Construction of high standard roads, recreation facilities or developments adjacent to a wilderness should consider the effect they will have on the wilderness." It further states that non-wilderness activities or uses that can be seen or heard from areas within the wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area (BLM, 1983). However, the handbook also states that effects of adjacent activities or land uses outside of wilderness areas should be identified. This policy also applies to WSAs and ISAs because the BLM must manage these areas as wilderness in accordance with the Interim Management Policy and Guidelines for Lands Under Wilderness Review (BLM document H-8550-1). If Congress designates them wilderness, the Interim Management Policy would cease to apply. Areas not designated as wilderness would be returned to multiple use in accordance with existing BLM planning documents. Since WSAs and ISAs are being managed as potential wilderness, impacts to these areas from influences outside of their boundaries must also be assessed.

Based on direction from the BLM Handbook and the BLM's Nevada State Director, potential effects of the alternative routes to dispersed viewpoints in wilderness areas, WSAs, and ISAs were addressed. Because it is not possible to assess specific impacts to dispersed viewpoints that could potentially



Note: Not to Scale

Locations of Shorter Towers in Utah Testing and Training Range

Figure 3-5

occur anywhere within these areas, potential effects considered the general viewing conditions (e.g., distance zone, view orientation, existing visual conditions - dominant or subordinate, etc.) and the visual contrasts of each alternative route.

Potential Effects

The project study area in Nevada and Utah is part of the Basin and Range physiographic province. Wilderness areas and WSAs in this physiographic province are generally associated with the mountain ranges, with one notable exception, Lower Salmon Falls Creek WSA in southern Idaho. Because of this tendency, views from wilderness areas and WSAs typically look out over large basins towards distant mountain ranges. Views can easily range beyond 30 miles under clear conditions.

The SWIP would likely tend to dominate views when seen from less than one-half mile away depending on specific viewing conditions (e.g., screening, viewer position and orientation, time of day, etc.). Because steel-lattice towers are proposed, it is expected that the transmission line would quickly become less visually evident with increasing distance from the viewer. In context with the grand scale of Basin and Range landscapes, the SWIP would be subordinate.

Because most of the landscapes surrounding wilderness areas and WSAs would be viewed from a superior position (i.e., looking down or over) in mountainous topography, most dispersed recreation users would likely tend to overlook the SWIP as they viewed the landscapes beyond (i.e., vast basins and rugged mountains) and the transmission line would be "backdropped" by the landscape. This viewing position would tend to make visual intrusions less evident and subordinate in the landscape. In a few cases, the SWIP may be viewed from an inferior position (i.e., looking up) which would tend to accentuate visibility, especially where it would be viewed against the sky or the horizon (skylined).

Under certain lighting conditions, the SWIP may be visible at greater distances because of the light reflected from towers and conductors. The use of dulled towers and non-specular conductors would be expected to largely mitigate this effect.

Mitigation The selectively committed mitigation measures (#9 and #10 in Table 1-5) were recommended to minimize potential adverse visual impacts of the SWIP. Mitigation was recommended based on the distance of the alternative routes from the boundaries of wilderness areas and WSAs:

- 0 to 1 mile — dulled towers and non-specular conductor
- 1 to 3 miles — non-specular conductor

This section describes the characteristic views and visibility of alternative routes for each wilderness area and WSA, and documents the potential effects of each alternative route on visual resources of these areas. The locations of wilderness areas and WSAs are illustrated on the Land Use Resources maps in the SWIP DEIS/DPA Map Volume. Tables 3-2 and 3-3 show, by wilderness area and WSA, the mileage of each alternative route that would pass within 0 - 1/4 mile, 1/4 - 1 mile, and 1 - 3 miles of their boundaries.

Idaho

Lower Salmon Falls Creek WSA - This WSA is the portion of Lower Salmon Falls Creek from Salmon Falls Creek Reservoir to Balanced Rock State Park. Because viewers in this WSA would be in the canyon, none of the alternative routes would be visible. Route F would parallel the existing Upper Salmon to Wells 138kV transmission line along the east boundary of this WSA and would be openly visible to viewers on the west rim of the canyon.

Nevada

Mt. Moriah Wilderness - This wilderness is situated 30 miles east of Ely near the Nevada-Utah state line within the boundaries of the Humboldt National Forest. Although the Cutoff Route (Link 267) would be visible for some distance to views northeast and east from this wilderness, it would be a subordinate feature in the vast open landscape of the Snake Valley. The 230kV Corridor Route (Link 464, 469, 471) would also be visible to some middleground and background views from this wilderness in the Sacramento Pass area (also refer to the Sacramento Pass Mitigation Reroute section in Chapter 3 of this document).

South Pequop WSA - This WSA is located in southern half of the Pequop Mountains in southeastern Elko County. With the exception of the Union Pacific Railroad and a few unpaved roads in Independence Valley and Goshute Valley, views from this WSA are of largely undisturbed natural landscapes.

Routes A, C, F, and G would be visible in the middle of Goshute Valley from 1 to 3 miles where these routes would parallel the Nevada Northern Railroad (Links 212, 230). From viewing positions in the northeast and east portion of this WSA, most of these routes would be backdropped by the Goshute Mountains east across the valley and would be visually subordinate to the landscape. Route D would tend to dominate views north where this route would pass within 1/4 mile of the boundary of this WSA at the railroad tunnel (Link 190) in the Pequop Mountains.

Bluebell WSA - This WSA is located in the northern part of the Goshute Mountain Range approximately 10 miles southwest of Wendover, Nevada. The landscape of this WSA is dominated by steep, mountainous topography with numerous canyons radiating along a north-south trending mountain range.

Routes B and E would pass north and east of this WSA and would be openly visible in Pilot Creek Valley (Link 222). From the northern portion of this WSA, views include Interstate 80 and several unpaved roads in the valley with occasional long-distance views of the salt flats beyond Wendover, Nevada. Views east, from north of Clifside to as far south as Felt Wash, include U.S. Highway 93 Alternate and unpaved access roads.

Routes D and E would dominate views where these routes would pass within 1/4 mile of the WSA for 2.4 miles. Routes A, C, F, and G would traverse in the center of Goshute Valley (5-6 miles away) parallel to the Nevada Northern Railroad and would be subordinate to views west from this WSA.

Goshute Peak - This WSA is located in the southern portion of the Goshute Mountain Range. Similar to Bluebell WSA, the landscape of this WSA is dominated by steep, mountainous topography with numerous canyons radiating from a north-south trending mountain range.

Routes B and E (Links 222, 225, 226) would be openly visible to views east and southeast from this WSA, except for a portion that may be screened by Ferguson Mountain. There are also distant views to the southwest of U.S. Highway 93. These routes would dominate views where they would be visible within one-quarter mile of this WSA (Link 226) for 1.3 miles and visible within 1/4 mile to 1 mile (Link 225, 226) for 3.4 miles.

Goshute Canyon - This WSA is located in the Cherry Creek Mountains from the Elko/White Pine county line to approximately 2 miles north of Cherry Creek. Views north are of the wide flat expanse of Steptoe Valley toward dark rugged forms of the Cherry Creek Range. The only apparent visual intrusions include U.S. Highway 93 on the far side of the valley, several two-track roads, and a series of seismic survey lines that cross the valley.

Routes D and G (Links 241, 242) would be largely subordinate views east from this WSA where they would be backdropped by the Shell Creek Range. Routes D and G may dominate some views across north Steptoe Valley from visitors to Goshute Cave where these routes would pass within 1 mile.

Marble Canyon WSA - This WSA is situated 30 miles northeast of Ely near the Nevada-Utah state line adjacent to the Mt. Moriah Wilderness in the Humboldt National Forest. Part of this WSA was included with the designation of the Mt. Moriah Wilderness. Although the Cutoff Route (Link 267) would be visible for some distance northeast and east from this WSA, it would be a subordinate feature in the vast open landscape of the Snake Valley. The Cutoff Route would be most noticeable along the lower portion of the alluvial benches that stretch from Marble Wash to Smith Creek Canyon within 1 to 2 miles of the east boundary of this WSA. Refer to Figure 4-5 in the Errata in Chapter 4 for the location of this WSA.

Swamp Cedar ISA - This ISA is located in Spring Valley several miles east of U.S. Highway 6/50. The 230kV Corridor Route (Link 380) is approximately one mile to the south of this area parallel to two existing 230kV transmission lines. Situated in the open valley, this route would be openly visible to middleground views. However, because of weaker structure contrasts associated with the existing transmission lines, the 230kV Corridor Route would not cause significant change in this landscape.

Mount Grafton WSA - This WSA is located on Mount Grafton approximately 30 miles southeast of Ely, Nevada, on the White Pine/Lincoln County line. The landscapes seen from the northern portion of this WSA are largely undisturbed, except for the Horse and Cattle Camp Backcountry Byway, an unpaved scenic route. The Southern Route would dominate views where it would pass adjacent to the northern boundary of this WSA. This route would be visible in Steptoe Valley (Link 364) from north of Mollys Nipples until it drops out of sight through numerous rock outcrops and scattered peaks north of Burnt Knoll Spring.

Fortification Range WSA - This WSA is located in Lincoln County between Lake Valley and Spring Valley just east of U.S. Highway 93. Only a very small portion of this WSA extends into the study corridor (Link 440). Only visitors to the northern part of the WSA would be affected by the Southern Route (Links 420, 430). Looking from mountain peaks above Indian Springs, viewers would see faint views of the SWIP where it would cross Spring Valley east towards Big Springs Wash. Views within the WSA to the west, south and far east would not be affected.

Delamar Mountains WSA - This WSA is located in the southern half of the Delamar Mountain Range east of the Pahranagat Wash Wildlife Refuge and Desert National Wildlife Refuge in Lincoln County. All of the alternative routes for the Midpoint to Dry Lake segment would use Link 690

which would traverse the base of these mountains along the west side of the WSA. The SWIP would be visible in the narrow valley formed by Pahranagat Wash.

When viewing north from this WSA, the SWIP would be seen for over 20 miles approaching across Delamar Valley parallel to the UNTP 500kV transmission line and the Lincoln County 69kV transmission line. All the routes would be visible along Link 690 where they would pass within one-quarter mile of the west boundary of this WSA for approximately 23 miles and would tend to dominate views west. However, because the SWIP would be parallel to two existing transmission lines, there would be only a slight incremental increase in the effect.

Evergreen WSA - This WSA is composed of three parcels of land, contiguous to the Desert National Wildlife Range (Link 690), located east of U.S. Highway 93 in the flat of Pahranagat Wash. All of the alternative routes for the Midpoint to Dry Lake segment would pass through the center of Pahranagat Wash adjacent to this WSA and parallel to U.S. Highway 93, the UNTP 500kV transmission line, and the Lincoln County 69kV transmission line (Link 690). Although backdropped by the Delamar Mountains, views from this relatively flat WSA would be dominated by the transmission lines and the highway in Pahranagat Wash. The addition of the SWIP would be a slight incremental increase in the visual effect of the existing lines and highway.

Fish and Wildlife 1, 2, & 3 WSA - Similar to the Evergreen WSA, this WSA is composed of three parcels of land contiguous to the Desert National Wildlife Range (Link 700, 720). All of the alternative routes for the Midpoint to Dry Lake segment would pass through the center of Coyote Spring Valley adjacent to this WSA and parallel to U.S. Highway 93, the UNTP 500kV transmission line, and the Lincoln County 69kV transmission line. Except for some views from points in the Elbow Range, the SWIP would be subordinate from this largely flat WSA. Parallel to two existing transmission lines and the highway in the middle of Coyote Springs Valley over one mile away, adding another transmission line would be a slight incremental increase in the visual effect.

Arrow Canyon WSA - This WSA is located in the Arrow Canyon Range, which rises abruptly along the east edge of Coyote Spring Valley (Link 720). All of the alternative routes for the Midpoint to Dry Lake segment would pass through Coyote Spring Valley below this WSA parallel to U.S. Highway 93, the UNTP 500kV transmission line, and the Lincoln County 69kV transmission line. From the southern portion of this WSA, views west would be dominated by transmission lines and the highway where the line would be within one-quarter mile of the east boundary for 4.3 miles. However, because the SWIP would be parallel to two existing transmission lines and the highway, there would be only a slight incremental increase in the visual effect. The SWIP would be subordinate in views west from the northern portion of this WSA.

Utah

Howell Peak WSA - This WSA is located north of Marjum Canyon in the Middle Range just south of the Swasey Mountains. The SWIP along the Cutoff Route or the 230kV Corridor Route (Links 462, 470) would dominate views south into the highly scenic and narrow Marjum Canyon, where these routes would parallel two existing 230kV transmission lines. From high points these routes would be visible to views southwest as they would cross Tule Valley, disappearing momentarily into Marjum Canyon and reappearing heading northeast across Whirlwind Valley.

King Top WSA - This WSA is located in the Confusion Range (Link 451). From the southern portion of this WSA, the Southern Route would be visible first where it would come around Pyramid

Knolls in the west. This route would dominate views along the southern boundary for approximately 3 miles. Knolls and hills west of the Confusion Range would screen some of the views of this route. Once past Warm Point the route would be screened by the Barn Hills. Views east from the northeast portion of this WSA would be of the Southern Route, where the route would parallel U.S. Highway 6/50 toward Sevier Lake.

Notch Peak WSA - This WSA is located in the House Range between U.S. Highway 6/50 on the south and Marjum Canyon on the north. Looking west viewers would first see the 230kV Corridor Route and the Cutoff Route (Link 462) across Tule Valley coming from Payton Canyon in the Confusion Range parallel to two existing 230kV transmission lines. From Pines Peak 3 miles north of Notch Peak, viewers would see the transmission line corridor continue from Tule Valley to south of Marjum Canyon. From the northern boundary, views would likely be dominated where the SWIP would pass through the highly scenic Marjum Canyon. Only viewers in the extreme northeast portion of the WSA would see these routes exit Marjum Canyon heading northeast across Whirlwind Valley.

From the southern portion of this WSA, viewers would see the Southern Route (Link 451) where it would traverse north across Tule Valley. The Southern Route would begin to dominate views south where it would turn northeast to parallel U.S. Highway 6/50 into the Sevier Desert.

Wah Wah Mountains WSA - This WSA is located in the Wah Wah Mountains north of Utah State Highway 21 (Link 451). Only a small portion of the northwest boundary of this WSA would view the Southern Route. At over 2.5 miles away, the Southern Route would be subordinate in the landscape.

Fish Springs WSA - This WSA is located in Fish Springs Range between Snake Valley and Fish Springs Flat (Link 630). From the southern end of this WSA viewers would see the Direct Route over one mile away. In this largely undisturbed landscape, the Direct Route would be noticeable, but would not be a dominant feature in the vast expanse of Tule Valley in the distance.

Swasey Mountain WSA - This WSA is located in the House Range (Link 630) between Tule Valley and Whirlwind Valley. Only two small portions of the northern boundary fall into the study corridors. Distant views of Direct Route from these areas would likely be screened by isolated hills at the end of the Swasey Mountains. The Direct Route would be subordinate to views northeast across Whirlwind Valley and Swasey Bottom over 3 miles away.

The 230kV Corridor Route and Cutoff Route (Link 470) would parallel two existing 230kV transmission lines across Whirlwind Valley. These routes would be subordinate to views south from this WSA and would be less than 2 miles away.

Recreation Effects

Although no developed recreation sites would be directly affected by the alternative routes, the SWIP would indirectly affect recreation resources. The presence of transmission line facilities may affect the experience available to recreation users. Towers, construction disturbances, and roads may affect recreation activities and experiences where they border, pass through, or cross developed and proposed recreation sites and areas. All park, recreation, and preservation areas within 3 miles of the assumed centerlines of the alternative study corridors were identified, mapped, and described during the inventory.

In general, all of the alternative routes would have a minor affect on dispersed recreation in the region. Off-highway vehicle (OHV) use (i.e., 4-wheel drives, motorcycles, and other all-terrain vehicles) could increase in some remote areas because of roads kept open for transmission line maintenance. This would be a potential benefit to public land users with OHVs. There could also be some benefit to dispersed hunting opportunities within remote areas because of potentially increased access.

The potential effects of the SWIP routes on recreation resources and the specific parks, recreation, and preservation areas that occur along each route are described below.

Midpoint to Dry Lake Segment

Route A - From Midpoint Substation to Jackpot, Nevada, several recreational sites occur along the route. Route A would pass adjacent to the Minidoka Relocation Center Interpretive Site (Link 20), adversely affecting the recreation experience of visitors to this historic site. The route would pass through the Snake River Rim Recreation Area, a BLM special management area between Interstate 84 and the Snake River canyon. That encompasses a large area of rural agricultural lands interspersed with the BLM-administered lands. In this largely developed area the adverse effects of Route A would be minimal except at a few specific recreation sites or features. In particular, the portion of this route that would cross the Murtaugh section of the Snake River, proposed for designation as a Wild and Scenic River, would diminish the experience of recreation users (e.g., river floaters) (Link 41). Similarly, the sight of this route crossing the Oregon Trail (Link 41) would briefly diminish the experience of users on this national recreation trail. Route A would minimally affect recreation at Nat-Soo-Pah, a private development located approximately 1 mile away. This route would only slightly increase the effects to recreation experiences where it would parallel the Upper Salmon to Wells 138kV and the Midpoint to Valmy 345kV transmission lines (Links 50, 70) near existing and proposed BLM campgrounds and recreation facilities located in the Salmon Falls Reservoir Special Recreation Management Area (SRMA).

From Jackpot, Nevada to the Robinson Summit Substation site, Route A would cross the California National Historic Trail three times (Links 1612, 211, 212), and the Pony Express Trail (Link 291). Construction disturbances and the presence of the SWIP at these crossings would diminish the recreation experience of users of these national trails. For dispersed recreation users in the South Pequop WSA (Link 212), the presence of Route A, 3 miles away in the Goshute Valley, would go largely unnoticed under most viewing conditions.

From the Robinson Summit Substation site to the Dry Lake Substation site, Route A would cross a portion of U.S. Highway 93, a designated scenic route (Link 675), and the proposed Kane Springs Backcountry Byway (Links 690, 700). Because viewing scenery is the major activity for users of these travelways, Route A would significantly diminish the experience of recreation travelers where it would be visible. Similarly, a large part of the dispersed recreation users' (e.g., hikers) experience can be attributed to viewing undisturbed natural landscapes. The presence of the SWIP would also adversely affect this recreation experience where Route A would pass near the Wayne Kirch Wildlife Management Area (Link 672), the Pahranagat National Wildlife Refuge, the Evergreen WSA (Link 690), the Delamar WSA (Link 690), the Desert National Wildlife Refuge (Link 690), the Fish and Wildlife 1, 2, & 3 WSAs (Link 700), and the Arrow Canyon WSA (Links 700, 720). The effects of Route A on primitive recreation opportunities would be significant where the SWIP would dominate views from WSAs (refer to Wilderness Effects in this chapter).

Route B - Route B is the same as Route A from Midpoint Substation to Jackpot, Nevada. From Jackpot, Nevada to the North Steptoe Substation site, Route B would cross the California National Historic Trail and California Trail Back Country Byway (Link 140), where viewing scenery is the major activity. Route B would introduce transmission line towers into the largely undisturbed landscape of Toano Draw, and the recreation experience of users would be significantly affected at each of the trail and byway crossings. This route would also pass within one-half mile of the Bluebell WSA (Link 222) and the Goshute Peak WSA (Links 222, 224, 226). The effects of Route B on primitive recreation opportunities would be significant where the SWIP would dominate views from WSAs (refer to Wilderness Effects in this chapter). From North Steptoe Substation site to Robinson Summit Substation site, Route B would cross the Pony Express Trail (Link 280). From Robinson Summit Substation site to the Dry Lake Substation site, Route B is the same as described for Route A.

Route C - Recreation effects for Route C from Midpoint Substation to Jackpot, Nevada, would be the same as those described for Route A. From Jackpot to the vicinity of Oasis, Nevada (Link 200), recreation effects would be the same as described for Route B. From the vicinity of Oasis to the Dry Lake Substation site, the recreation effects would be the same as those described for Route A.

Route D - From Midpoint Substation to HD Summit (Link 162), northeast of Wells, Nevada, recreation effects for Route D would be the same as those described for Route A. Route D would cross the California National Historic Trail (Link 167, 180, 190) three times. Like Route B, the recreation user experience would be significantly affected at each of the crossings of this trail. Route D would also pass adjacent to the South Pequop WSA (Link 190), where the effects on primitive recreation opportunities would be significant (refer to Wilderness Effects in this chapter). From Goshute Valley (Link 230) to Dry Lake Substation site, recreation effects for Route D would be the same as those described for Route A, except Route D would pass closer to Goshute Canyon WSA (Link 241, 242) in Steptoe Valley.

Route E - From Midpoint Substation to the vicinity of Oasis, Nevada (Link 200), the recreation effects of this route would be the same as those described from Route A. From the vicinity of Oasis to the Dry Lake Substation site, recreation effects would be the same as those described for Route B.

Route F - From Midpoint Substation to Jackpot, Nevada, Route F would pass through the Snake River Rim Recreation Area, a BLM special management area between Interstate 84 and the Snake River Canyon which encompasses a large area of rural agricultural lands interspersed with the BLM-administered lands. In this largely developed area, the adverse effects of Route F would be minimal, except where it would pass near or adjacent to a section of the Snake River that is proposed for Wild and Scenic River designation (Link 61), the west boundary of Hagerman Fossil Beds National Monument (Links 62, 64), and Salmon Falls Creek WSA (Link 64). In addition, this route would cross two portions of the Oregon Trail (Link 61, 64), U.S. Highway 30, and the Thousand Springs Scenic Route (Link 61) near Hagerman, Idaho. Near Hagerman, Route F would pass near Malad Gorge State Park (Link 61), parallel part of the Salmon Falls Creek Area of Critical Environmental Concern (ACEC), and pass within one-mile of the Balanced Rock State Park (Link 64). Route F would slightly increase in effects to recreation experiences where it would parallel the Upper Salmon to Wells 138kV and the Midpoint to Valmy 345kV transmission lines (Links 50, 70) near existing and proposed BLM campgrounds and recreation facilities in the Salmon Falls Reservoir SRMA.

From Jackpot, Nevada, to the vicinity of Oasis, Nevada (Link 200), recreation effects would be the same as those described for Route B. From the Oasis area to the Dry Lake Substation site, recreation effects would be the same as those described for Route A.

Route G - Recreation effects for Route G from Midpoint Substation to the vicinity of Contact, Nevada, would be the same as those described for Route A (to Link 130). At Link 130, Route G would turn southeast (Link 151) and cross the California National Historic Trail and the California Trail Back Country Byway. Like Route B, this route would introduce transmission line towers into a largely undisturbed landscape. The recreation experience of trail and byway users would be significantly affected at the crossings. From the Oasis vicinity (Link 200) to Currie, Route G is the same as described for Route A. From Currie to the North Steptoe Substation site, Route G would pass by the Goshute Canyon WSA (Links 241, 242, 244). The effects of Route G on primitive recreation opportunities would likely not be significant except where the SWIP would dominate views by visitors to Goshute Cave (Link 241) in the Goshute Canyon Special Natural Area. From North Steptoe Substation site to Robinson Summit Substation site, recreation effects for Route G would be the same as those described for Route B. From Robinson Summit Substation site to Dry Lake Substation site, recreation effects for Route G would be the same as those described for Route A.

Ely to Delta Segment

Direct Route - This route would cross three segments of the Pony Express Trail (Links 265, 266) near Stonehouse, Nevada, near the southern end of the Antelope Range. The recreation experience of users would be significantly affected in the area around the crossings of this trail by the introduction of transmission line towers into a largely undisturbed landscape.

The Direct Route would pass near the Fish Springs WSA and the Swasey Mountain WSA (Link 630). The effects of the Direct Route on primitive recreation opportunities would be significant where the SWIP would dominate views from wilderness areas or WSAs (refer to Wilderness Effects in this chapter). This route would also pass near the Topaz Lake Wildlife Management Area (Link 572).

Cutoff Route - The Cutoff Route would have the same effects on the Pony Express Trail (Links 265, 266) as described for the Direct Route. This route would pass within 2 miles of the Gandy Mountain ACEC. From Eskdale, Utah (Link 461), to Delta, Utah, the only significant recreation effects of the Cutoff Route would occur where the SWIP would dominate some dispersed views from WSAs including the Mt. Moriah Wilderness (Link 267), Howell Peak WSA (Link 462, 470), Notch Peak WSA (Link 462, 480), and the Swasey Mountain WSA (Link 470) (refer to Wilderness Effects in this chapter). The Cutoff Route would not affect the proposed interpretive site (Link 462) for Great Basin National Park (GBNP) or the Topaz Lake Wildlife Management Area (Link 572).

230kV Corridor Route - The 230kV Corridor Route would cross the entrance road to Cave Lake State Recreation Area (Link 380) parallel with two 230kV and one 69kV transmission lines. However, the addition of the SWIP would slightly increase the adverse effects of the existing lines in this area, but this route would not affect recreation in the park itself. The 230kV Corridor Route would pass near proposed BLM recreation areas at Comins Lake (Link 380) and through to the proposed Weaver Creek Scenic Area (Link 460). No impacts were identified at the Weaver Creek Scenic Area, as the withdrawal has been revoked by a notice published in the Federal Register by the BLM. The 230kV Corridor Route would pass within 2 miles of the northern boundary of GBNP in Sacramento Pass (Link 460). Part of the purpose of GBNP is to interpret the Basin and Range physiography of the region. Although the 230kV Corridor Route would not directly affect recreation in GBNP, this route would cross U.S. Highway 6/50 that many park visitors use to access the area. The 230kV Corridor Route, parallel to the existing 230kV transmission lines, would only slightly increase the affect on visitor's experience of the basin areas interpreted by the park. The route would also pass over one

mile from the Swamp Cedar Special Natural Area (Link 380) and more than 2 miles from Osceola Geologic Area (Link 460). These areas would be slightly affected by another line in this corridor. The 230kV Corridor Route from Eskdale (Link 462) to Delta, Utah would be the same as described for the Cutoff Route.

Southern Route - The Southern Route would cross the Horse and Cattle Camp Scenic Backcountry Byway (Link 364) twice. The recreation experience of users of this byway would be significantly affected at the crossings of this trail by the introduction of transmission line into a largely undisturbed landscape. This route would also pass within 2 miles of Ward Charcoal Ovens State Historic Site (Link 364) and within one mile of two proposed GBNP interpretive sites [on U.S. Highway 93 (Link 420) and Utah State Highway 21 (Link 451). These sites are proposed as part GBNP's interpretation of the Basin and Range physiography of the region. This route would adversely affect the potential future recreation experience of visitors to the area. The Southern Route would have significant recreation effects where the SWIP would dominate views from wilderness areas or WSAs, including the Mt. Moriah Wilderness, the Grafton WSA (Link 364), Wah Wah Mountains WSA (Link 451), King Top WSA (Link 451), and Notch Peak WSA (Link 451).

Herd Management Areas

Public lands in Nevada and Utah are home to herds of wild horses and burros. The BLM and Forest Service (FS) manage these animals under the Wild and Free Roaming Horse and Burro Act (1971), which states that wild and free roaming horses and burros are protected from capture, branding, harassment, or death. Wild horses are defined as unbranded and unclaimed horses with progeny that have used public lands on or after December 15, 1971, or that use Federal lands as all or part of their habitat. The Herd Management Areas (HMAs) are areas of public land where habitat is provided for one or more wild horse herds in order to maintain a good population, social structure, and age-sex ratio of the animals. The horses can move freely within the HMAs and often migrate every year as a function of weather and availability of food and water.

Following the release of the SWIP DEIS/DPA in June of 1992, the BLM raised the issue of potential effects of the SWIP routes on HMAs and what the impact would be on wild horses and burros. Their primary concern centered on the potential harassment of wild horses and burros during the construction phase of the SWIP transmission line and the loss of forage from the construction of access roads and tower sites. Other concerns were establishing fences that would inhibit movement to food and/or water and conflicts with humans.

Affected Environment

The SWIP alternative routes would affect HMAs in Nevada and Utah (refer to Tables 3-4 and 3-5). The BLM's highest concerns in Utah occur where critical habitats are crossed. These areas are monitored yearly and evaluated using trend plots. The trend plots are located in all HMAs to monitor habitat through the use of water and feed during extended periods of time. The trend plots help determine an accurate population of the herds, age-sex ratio, social structure, and general physical condition of horses and burros within the HMAs. On the Ely to Delta Segment, the Direct Route would disturb 7.8 miles of critical habitat and 2.5 miles on the Cutoff Route. No other routes within the Ely to Delta Segment or the Midpoint to Dry Lake Segment affect critical areas.

On the Midpoint to Dry Lake Segment, Route B would cross the most miles of HMAs within the study area (159.8 miles) and Routes A & C the least (123.8 miles). The agency preferred route crosses only 115.1 miles of HMAs. The worst route on the Ely to Delta Segment is the Direct Route which crosses 28.0 miles HMA and 7.6 miles of critical horse habitat. The southern route crosses only 13.1 miles of HMAs and no critical habitat.

Environmental Consequences

Because of their size and numbers throughout the study area HMAs, like range allotments, are unavoidable by the alternative routes. Issues considered during the impact analysis included the transmission lines creating a barrier or hazard to the movement of any wildlife species and the potential harassment by increased human activity/public access.

Ground disturbance caused by construction of the SWIP would result in the insignificant loss of habitat within HMAs. Access road construction and tower footings would result in insignificant long-term loss of forage. Construction of the SWIP transmission routes would likely displace herds from the vicinity of the right-of-way during high activity. However, the line would not inhibit the movement of the herds after its completion. Increased public access into the remote areas during construction may result in increased human harassment and trappings of wild horses. The increased harassment would alter the current plot trend studies and may create new locations to be established or borders moved.

Mitigation

To reduce potential impacts resulting from ground disturbance and increased levels of public access in HMAs crossed by alternative transmission routes, generic and selectively recommended measures would be applied. For example, restricting vehicle movement of construction equipment to routes (#1) and recontouring and revegetating disturbed areas where necessary (#3 & 4) would minimize the loss of forage. Limiting construction activities during sensitive periods (foaling season) (#11) would minimize harassment.

Impacts in the Oasis Area

During the formal public meetings for the SWIP DEIS/DPA in Wells, Nevada on August 4, 1992, residents of Oasis opposed the preferred alternatives that would pass west of Oasis along the base of the Pequop Mountains (Link 211). Their opposition was based on proposed development plans by Northern Holdings, Inc. and CSY Investments. These proposed developments were not identified during the SWIP inventory because neither of these developers have been actively seeking action by Elko County. This section addresses the concerns of these future developments. Written comments as well as a summary of comments expressed at the formal public meeting held in Wells by the residents of Oasis and representatives of these development companies are listed in Chapter 4 of this document.

Northern Holdings, Inc. - Northern Holdings, Inc. has future plans to develop residential and commercial uses in R66E T36N Sections 2 and 3, west of the existing development at Oasis. The development plans would be phased. The first phase would develop commercial uses, including infrastructure, traveler facilities, truck repair, restaurant, and other similar facilities. The second phase

would consist of subdividing a portion of Section 2 near the existing mobile home park into lots for a residential subdivision. There are also future plans to subdivide part of Section 3 for residential development. The primary concerns of the developers are the potential visual effects that the preferred alternatives would have on views from future residential areas, property values, and the unknown effects of EMFs.

CSY Investments - CSY Investments owns over 100,000 acres of land, much of it distributed in checkerboard fashion among the BLM-administered lands, in the Goshute Valley and around Oasis. Conceptual plans propose a large recreation and vacation development that extends from north of Interstate 80 near Oasis south into Goshute Valley. CSY Investments' planned development is particularly concerned with Link 211 which would traverse southwest from Squaw Creek across Interstate 80 and would then turn northwest and would pass within one mile of the Big Springs Ranch Headquarters. CSY Investments is concerned that Routes A, C, F, and G would significantly affect the scenery of Goshute Valley and marketability of the mini-ranch sites and water ranch sites proposed in the Big Springs Ranch Development Plan. The Big Springs Ranch Development Plan conceptualizes 24,960 acres of mini-ranch sites in the western half of Goshute Valley, 8,320 acres of mountain cabin and retreat areas along the foothills of the Pequop Mountains, 13,440 acres for a hunting club and wildlife management area, 8,960 acres of recreational use areas (e.g., off road vehicle use and camping facilities) on the east side of the Goshute Valley south of Interstate 80, 6,400 acres of tourist/commercial sites, and 1,920 acres for industrial sites along the interstate (Big Springs Ranch Proposed Land Use Diagram, 1992). CSY Investments also expressed concern for a private, unregistered grass airstrip near the Big Springs Ranch Headquarters.

Subroute Comparison

Link 211 was compared with Links 221 and 223 (Subroute Set 9) in Appendix D of the SWIP DEIS/DPA. The comparison summarized the impact data for the five resource disciplines of concern (i.e., biology, earth, visual, land use, and cultural). These links have been re-evaluated to consider the proposed developments of CSY Investments, Northern Holdings, Inc., and other public comments from the residents at Oasis.

Link 211 was environmentally preferred in the SWIP DEIS/DPA because it would be a less visually intrusive crossing of Interstate 80, a low visibility corridor designated by the Elko District of the BLM managed with Visual Resource Management (VRM) Class II (refer to Visual Resources in the SWIP DEIS/DPA). With the dark colors of the Pequop Mountains as a backdrop, this link would cause weaker visual contrast to travelers on Interstate 80.

Strong and moderate visual contrasts along Link 211 would result in high and moderate visual impacts to views from the possible future recreational ranch properties being planned along the base of the Pequop Mountains. Links 221 and 223 would traverse the center of the valley along the edge of one of the planned development area. Although visual contrasts would be strong to moderate, these links would be viewed from several miles away and would result in insignificant visual impacts to views from the planned recreational ranch properties. However, Links 221 and 223 would likely be more highly visible at the crossing of Interstate 80 in the middle of the valley and to views from dispersed recreation users in the Pequop Mountains and Toano Range.

In addition, Link 211 would cause less disturbance to shallow ground water areas, but would cross numerous intermittent streams east of the Big Springs Ranch Headquarters. Links 221 and 223 would

also cross numerous intermittent streams and some areas with high flood potential north of Shafter along the existing railroad.

The only sensitive wildlife species that would be effected by this link would be sage grouse leks in Goshute Valley. Link 211 is part of Routes A, C, F, and G, and is the environmentally preferred subroute through Goshute Valley. Sage grouse leks occur near the end of Link 221.

Links 221 and 223 would better utilize the BLM utility planning corridor, which follows the railroad corridor through the center of Goshute Valley, and would pass through the edge of the Lucin C MOA. Link 211 would require a plan amendment to the BLM's planning utility corridor in this area.

Impact Summary Table

Links	Biology			Earth			Land Use			Cultural			Visual				Comments
	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	VRM	
211	0	0	1.6	17.6	0	0	0.8	14.5	0	7.1	0.9	0.3	15.1	17.0	0	5.8	Better crossing of I-80, closer to ranch
211 & 223	0.1	0	1.5	17.5	0.1	0	16.2	7.3	0	10.8	1.0	0.4	16.7	8.2	0	4.4	Utilizes railroad corridor, crosses less future development

Conclusions

In response to the public comments from residents at Oasis and the potential cumulative effects to planned developments by Northern Holdings, Inc. and CSY Development, the Agency Preferred Alternative has been modified slightly to follow Links 221, 223 along the railroad corridor through the center of Goshute Valley. The utility also prefers this subroute. This subroute would completely avoid future potential conflicts with Northern Holdings' properties and would minimize potential future impacts to significant portions of the CSY Investments' development. Because neither of these developments have been formally filed with Elko County the Environmentally Preferred Subroute is still Link 211.

Antelope Spring Trilobite Beds

The National Park Service, in a comment letter on the SWIP DEIS/DPA, identified an area of outstanding paleontological resources in the House Range that would be crossed by the 230kV Corridor Route.

The scientific value of the paleontological resources in the House Range has been described in a number of papers dating to 1875. The House Range, located in west central Utah, is famous for its Cambrian and Ordivician fossils including brachiopods, clams, sponges, trilobites, and other fossils totaling over forty different species (Bostick and Niles, 1975). Occurring primarily in the Notch Peak limestone strata of the House Range and adjacent outcrops, trilobites are the prize of commercial and amateur (i.e., rock hounds) fossil-gathers that use the area.

A study conducted in 1975 inventoried an area known as the Antelope Spring Trilobite Beds and found it to have paleontological resources of important scientific value. The study recommended that the area be evaluated for potential registry as a National Natural Landmark. The 1979 site evaluation included an area of 144 sections or approximately 92,000 acres. This potential site evaluation area would be crossed by the 230kV Corridor Route. The specific boundaries have yet to be determined and impacts to the potential registry as a National Natural Landmark cannot be assessed. However, impacts to paleontological resources were analyzed in the SWIP DEIS/DPA (refer to pages 4-4 through 4-8 of the DEIS/DPA).

The Agency Preferred Alternative (230kV Corridor Route) would cross through Marjum Canyon in the House Range. Much of this area was inventoried for the SWIP using a high sensitivity level for paleontological resources (also refer to the Volume II - Natural Environment Technical Report). Potential impacts of the construction in the area were determined to be low. Mitigation measures including use of existing access roads, overland access routes, and monitoring of construction by a qualified paleontologist are expected to minimize any impacts (refer to Tables 1-5 and 1-6 of this document). Specific stipulations will be developed in the COM Plan to mitigate significant resources that may be found during construction.

Sacramento Pass Mitigation Reroute

In response to public comments about impacts to private lands and potential visual impacts to travelers on U.S. Highway 6/50, several mitigation reroute alternatives were analyzed.

Affected Environment

This section provides a description of the resources potentially affected by rerouting for mitigation through the Sacramento Pass area. The following resources were inventoried:

- earth resources (soils, geology, paleontology, minerals, surface hydrology)
- biological resources (vegetation, wildlife, riparian, wetlands, and threatened, endangered, and other special-status species)
- land use resources (land jurisdiction, existing and planned land uses, parks, recreation, preservation areas, transportation and access, grazing and mining claims and extractive uses)
- visual resources (viewpoints, natural scenery)
- cultural resources (prehistory, enthnohistory, history, archaeology)

The inventory was completed to provide a basis to evaluate the impacts of each mitigation reroute alternative. Inventory methods were the same as described in the SWIP DEIS/DPA and the Technical Reports.

The resource discussions that follow are based on the following subroutes:

- Subroute 1 - Links 463, 469, 471, 473

- Subroute 2 - Links 464, 465, 469, 471, 473
- Subroute 3 - Links 464, 466, 468, 471, 473
- Subroute 4 - Links 464, 466, 467, 472 (part of the original 230kV Corridor Route)

Earth and Water Resources

Geology - There are no known active faults or geologic hazards in the Sacramento Pass area.

Paleontology - High sensitivity paleontological resources may be present in younger Tertiary sedimentary rocks (Tys) near Weaver Creek in the Snake Range as well as in Quaternary alluvium and colluvium (Qs) in large areas of the Snake Valley. Links 463, 464, 465, 466, 467, 468, 469, 471, 472, and 473 cross these areas, however, no known significant fossils have been found in the area.

Mineral Resources - Portions of the Osceola and Black Horse Mining Districts occur in the area. Mineral resources include silver, gold, copper, zinc, tungsten, and lead found in veins along faults and as replacement deposits in limestone. Placer deposits are also common. Mining in the area occurred primarily in the early 1900s but there are still some small placer operations (BLM 1993). Links 463, 464, 465, 566, 467, 469, 469, and 471 cross areas which may have mineral resources.

Soils - The soils include Typic Camborthids - Typic Torriorthents - Xerollic Haplargids with a slight erosion hazard (Links 467 and 471), Xerollic Durorthids - Xerollic Durargids - Xerollic Haplargids with a moderate erosion hazard (Links 476 and 471), Typic Xerorthents - Lithic Xerorthents (may unit 49) with a moderate erosion hazard (Links 463, 464, 465, 466, 467, 468, 469, and 471), and Aridic Haploxerolls - Lithic Argixerolls - Rock Outcrop with a moderate erosion hazard (Links 463 and 464). These soil units are described in Table ER-6 of the SWIP DEIS/DPA.

Water Resources - Several intermittent drainages occur in the Sacramento Pass area. Perennial streams in the area include Weaver Creek and Silver Creek. Silver Creek is crossed by Link 467 at two location, and by Link 471 at two locations. Weaver Creek is crossed at one location each along Links 464, 467, 467, and 468. Springs located within 0.5 mile of the proposed centerline occur along Link 467 (2 spring locations) and Link 469 (1 spring location). Numerous springs occur in the region.

Refer to Figure 3-6 for an illustration of sensitive Earth Resources.

An inventory of the Sacramento Pass alternatives was completed based on the methods and results as described in Chapter 3, Affected Environment, of the SWIP DEIS/DPA as well as in the Technical Report for the Natural Environment-Volume II. Information on part of the area is discussed under the "230kV Corridor Route" section of the SWIP DEIS/DPA and under the section "Nevada" for the various disciplines geology, paleontology, mineral resources, soils, and water resources in the Technical Report, Volume II, Chapter 2, pages 3-1 to 3-27.

Subroute 1

This subroute crosses 5.4 miles of areas with potentially high sensitivity paleontological resources (Links 463, 469, 471), although no fossils have been found in the area. There is no prime farmland along this subroute.

Subroute 2

This subroute crosses 7.1 miles of areas with potentially high sensitivity paleontological resources (Links 464, 465, 469, 471) although no fossils have been found in the area. There is no prime farmland along this subroute.

Subroute 3

This subroute crosses 6.9 miles of areas with potentially high sensitivity paleontological resources (Links 464, 468, 471) although no fossils have been found in the area. There is 1.2 miles of prime farmland along the assumed centerline of Link 467.

Subroute 4

This subroute crosses 1.3 miles of areas with potentially high sensitivity paleontological resources (Links 464, 467) although no fossils have been found in the area. There is 1.2 miles of prime farmland along the assumed centerline of Link 467.

Biological Resources

Wildlife species which occur in the area include pronghorn antelope, mule deer, bobcat, mountain lion, coyote, whitetail, antelope squirrel, and desert cottontail. Common bird species include chukar partridge, horned lark, golden eagle, prairie falcon, and red-tailed hawk (Gordon, personal communication, 1993). Refer to Figure 3-7 for an illustration of sensitive Biological Resources.

The mitigation reroute alternatives through the Sacramento Pass area traverse sagebrush shrub, mountain shrub, grassland, and riparian communities (refer to Figure 3-8). Sagebrush scrub, characterized by greasewood and big sagebrush associations, occurs along all the subroutes. Mountain shrub, primarily pinon-juniper woodlands, occurs along the western links at higher elevations (Links 460, 463, 464, 465, and 466). Riparian woodlands, characterized by narrowleaf cottonwood and willow, are supported by Silver Creek (Links 467, 471). Grasslands, characterized by winter fat, galleta grass, and Indian ricegrass occur along the Utah portions and are scattered in Nevada. Playas, characterized by very sparse vegetation cover, occur near the Nevada-Utah border.

Subroute 1

Wildlife - Seven special status bird species have been identified as potentially occurring in the area by agency personnel in Utah (Gordon, personal communication, 1993). Bald eagle and peregrine falcon are listed as endangered at the federal and state levels. Bald eagles are residents of the Snake Valley and the Ferguson Desert (south of the area) during winter months, although no active nests are known to exist along the proposed links. Peregrine falcons are occasional migrants during the fall and spring. Ferruginous hawks and loggerhead shrikes (Federal candidate Category 2 species) and golden eagle, mountain bluebird, and Swainson's hawk (sensitive species) may nest in suitable habitat within the SWIP location.

The area provides year-long habitat for antelope. Link 471 crosses through identified crucial antelope kidding grounds (Podborny, personal communication, 1993). No crucial raptor habitat exists within the proposed area and no known active raptor nests occur within one mile of the assumed centerline.

Plants - Three special status plant species have been identified within the area. One of the three special status plant species is Swertia gypsicola. Its known habitat exists along the eastern links in Utah (Links 471 and 473), although exact locations were not identified. This is a Federal candidate, Category 2 plant species that occurs in desert areas characterized by greasewood-saltbush associations (Mendenhall, personal communication, 1993). Two special status plant species were identified within Nevada (NNHP 1993). Sclerocactus pubispinus occurs within the one-mile corridor for Link 463. It is protected in the State of Nevada by the Cactus and Yucca Law. Two populations of the third species, Cymopterus basalticus, occur. One is located within one-mile of Link 471 and one is along the assumed centerline of Link 471. This is Federally listed as 3C (more common than frequently believed) and is a watch species in Nevada (Northern Nevada Native Plant Society - NNNPS).

Subroute 2

Wildlife - Special status wildlife species are the same as those described for Subroute 1.

Plants - Known habitat for Swertia gypsicola exists along the eastern links in Utah (Links 471 and 473), although exact locations were not identified. This is a Federal candidate, Category 2 plant species that occurs in desert areas characterized by greasewood-saltbush associations (Mendenhall, personal communication, 1993). The third species, Cymopterus basalticus, occurs within one-mile of Link 465. This is Federally listed as 3C (more common than frequently believed) and is a watch species in Nevada (NNNPS).

Subroute 3

Wildlife - Special status wildlife species are the same as those described for Subroute 1.

Plants - Habitat for one special status plant species, Swertia gypsicola, occurs in Utah along Links 471 and 473 as described for Subroute 1.

Subroute 4

Wildlife - Special status bird species are the same as those described for Subroute 1.
Although the area provides year-long habitat for antelope, no critical habitat has been identified along these links. Antelope kidding grounds occur north of Link 467, within the one-mile corridor (Podborny, personal communication, 1993). Antelope kidding grounds are important. However, to remain consistent with the previous analysis, the grounds have not been identified as crucial. No crucial raptor habitat exists within the proposed area and no known active raptor nests occur within one mile of the assumed centerlines.

Plants - One special status plant species has been identified within the area. Known habitat for Swertia gypsicola exists along the eastern links in Utah (Links 467 and 472), although exact locations were not identified. This is a Federal candidate, Category 2 plant species that occurs in desert areas characterized by greasewood-saltbush associations (Mendenhall, personal communication, 1993).

Land Use

Land Jurisdiction - Approximately 90 percent of the lands in the Sacramento Pass area are administered by the BLM. Of the remaining lands, approximately 7 percent are private land, and about 3 percent are state-administered lands (refer to Figure 3-9).

Existing & Planned Land Uses - Several small ranches and farms occur in the Sacramento Pass area. The majority of the land in the area is range allotments administered by the BLM. An area of cultivated/agricultural lands occurs between Links 467 and 471 near the Nevada-Utah state line. No airports/airstrips occur within this vicinity. Two 230kV wood H-frame transmission lines, one 69kV transmission line, and one single-pole distribution line traverse through this area (Links 460, 464, 466, 467, 472, 461).

Parks, Recreation, and Preservation Areas - Parks, recreation, and preservation areas include a rest area maintained by the Nevada State Highway Department along U.S. Highway 6/50 (Link 463), Mt. Moriah Wilderness, and the Humboldt National Forest north of Links 469, and 471. Two undeveloped recreation areas include Weaver Creek Scenic Area south of Link 464 and Sacramento Pass Recreation Area northwest of Link 463.

Transportation and Access - U.S. Highway 6/50 is crossed by Links 463, 465, 468, and 467. Numerous unpaved roads and jeep trails occur in the Sacramento Pass area. These roads are unmaintained and provide access to the Forest Service-administered lands and the Mt. Moriah Wilderness.

Mining Claims and Extractive Uses - Numerous mining claims exist in the Sacramento Pass area. However, only a small percentage of these mining claim are maintained in active status.

Refer to Figure 3-10 for an illustration of the Land Use resource features.

Subroute 1

Subroute 1 would pass between the Weaver Creek Scenic Area and the Sacramento Pass Recreation Area (Link 463). Continuing northeast the subroute would cross U.S. Highway 6/50 through rolling basins and low grasslands. This subroute would pass to the north of cultivated lands along Silver Creek, then turn southeast (Link 471, 473) to rejoin the 230kV Corridor Route

Subroute 2

Subroute 2 would turn sharply to cross U.S. Highway 6/50 at a right angle (Link 465). Two miles beyond the highway, this subroute would turn east and follow Links 469, 471, and 473 as described in Subroute 1.

Subroute 3

Subroute 3 would cross U.S. Highway 6/50 just north of the original 230kV Corridor Route (Subroute 4). The subroute would cross the highway, roughly parallel to the existing 230kV transmission lines. From here, it would follow the same corridor as Subroute 1 (refer to Subroute 1).

Subroute 4

Subroute 4 would parallel the two existing 230kV transmission lines. The subroute would cross through the BLM Weaver Creek Scenic Area (Link 464) and pass to the north of GBNP (Link 464, 466, 468). The subroute would cross U.S. Highway 6/50 once.

Visual Resources

Characteristics common to all reroute alternatives include: No Class A scenery and no VRM Class II areas within the study corridors in the Sacramento Pass area.

All parks, recreation, and preservation areas have been identified as high sensitivity viewpoints. The BLM has stated that Weaver Creek Scenic Area is not a high sensitivity viewpoint and of low priority (Bunker, personal communication, 1993). However, the scenic area has been included as a high sensitivity viewpoint to be consistent with the previous visual inventory and analysis.

Refer to Figure 3-11 for an illustration of Visual Resource potential impact zones.

Subroute 1

Scenic Quality/Variety Class - Class B scenery primarily occurs in the mountain and foothills landscape character types (refer to page 6-15 of the Volume III - Human Environment technical report) along part of Link 463. Class C scenery predominately occurs in the rolling foothills and valley desert scrub landscape character type, in both Nevada and Utah (Links 463, 469, 471, 473).

Sensitive Viewpoints and Visibility - This subroute would be viewed in the foreground and middleground by users of the Sacramento Pass Recreation Area (Link 463). It would also be visible from the foreground and middleground views of users of the Weaver Creek Scenic Area (Link 463) and middleground to background views by backcountry users of the Mt. Moriah Wilderness (Link 471).

VRM - This subroute would cross VRM Class III areas for 8.5 miles (Link 463, 469, 471) in the Sacramento Pass area.

Subroute 2

Scenic Quality/Variety Class - Class B scenery occurs along a portion of Link 464 in the valley foothills landscape character type. The predominant scenic quality is Class C in this area and occurs in alluvial valleys (Link 464, 465), rolling foothills (Link 465, 469, 471), and valley desert scrub (Link 473) landscape character types.

Sensitive Viewpoints and Visibility - This subroute would be visible in the foreground (Link 464) and middleground (Link 465) to users from Weaver Creek Scenic Area. This subroute would not be visible to users in the planned campground located in the central area of Sacramento Pass Recreation Area. Although the central portion of the Sacramento Pass Recreation Area is higher in elevation than the surrounding area, the rock escarpment would shield users' views of this route. Middleground and background views from dispersed backcountry users in Mt. Moriah Wilderness are also visible from this route (Link 471).

VRM - VRM Class III areas are found along all of Links 465 and 469 and parts of Links 464 and 471 for a total of 8.5 miles.

Subroute 3

Scenic Quality/Variety Class - Class B scenery occurs in the valley foothills landscape character type (Link 464). This subroute would cross primarily Class C scenery in alluvial valleys (Link 464, 466), rolling foothills (Link 468, 471), and desert scrub (Link 473) landscape character types.

Sensitive Viewpoints and Visibility - This subroute would be visible in the foreground from the Weaver Creek Scenic Area (Link 464), a low sensitive viewpoint. It would also be visible in middleground and background views of backcountry users of Mt. Moriah Wilderness (Links 464, 469, 471).

VRM - This subroute would cross VRM Class III areas along all of Links 466 and 468 and portions of Links 464 and 471 for a total of 7.5 miles.

Subroute 4

Scenic Quality/Variety Class - Class B scenery occurs in the valley foothills landscape character type (Link 464). The predominate scenic quality is Class C in the area and occurs in the alluvial valley (Link 464, 466), rolling foothills (Link 467), and desert scrub (Link 467, 472) landscape character types.

Sensitive Viewpoints and Visibility - This subroute would be visible by users in the foreground from Weaver Creek Scenic Area (Link 464). This route would not be visible to users from the Sacramento Pass Recreation Area.

VRM - This subroute would cross VRM Class III along all of Link 466 and portions of Links 464 and 467 for a total of 7.0 miles.

Cultural Resources

The study strategy and methods previously developed for the cultural resources studies were also used to evaluate the Sacramento Pass subroutes. These methods and the cultural history of the region are summarized in the SWIP DEIS/DPA and further discussed in the supporting cultural resources technical report. They are not repeated here.

Agency files were reviewed to identify archaeological and historical sites previously recorded within 2-mile-wide corridors along the newly defined alternative links. Several surveys had been undertaken in

the general vicinity of the alternative subroutes for various types of projects including juniper chaining, highway upgrades, land exchanges, transmission line construction, telephone cable installation, and BLM recreation inventories and planning efforts (Busby 1974, Cain 1968, Henderson 1979, Moore 1988, Newkirk 1982, Revitte 1983, Stornetta 1988). These surveys encompass only a small percentage of the new alternative corridors. Nevertheless, they provide some indication of the types and frequencies of cultural resources present in the study area.

A total of 20 previously recorded archaeological and historical sites were identified within the 2-mile-wide corridors along the newly defined alternative links (Table 3-6). Fourteen other cultural resources inventoried for the original study are located within the corridors for the subroutes being compared. While collecting these data, documentation was reviewed on an additional 14 cultural resources recorded in the vicinity but beyond the limits of the 2-mile-wide corridors. In general, these resources were similar to those within the corridor.

One of the more significant cultural resources in the general area of the Sacramento Pass reroute alternatives is the Lehman Caves National Monument, which includes the Lehman orchard and aqueduct and the Rhodes cabin, both of which are listed on the National Register of Historic Places. The monument is located more than 5 miles to the south of any of the alternatives being considered and should not be affected. The Osceola Ditch, constructed in the 1880s for hydraulic placer mining, has been determined to be eligible for listing on the National Register of Historic Places. It would be crossed by Link 460 just to the west of the subroutes currently being evaluated. Therefore, the ditch would be crossed by all of the reroute alternatives being considered and has no bearing on the current analysis of the subroutes. Another potentially sensitive area is the Black Horse Mining District, which *boomed* in the early 1900s. The Black Horse town site and cemetery are located to the northwest of all the reroute alternative. In the Utah portion of the analysis area, archaeological site 42MD767 is a previously recorded prehistoric base camp rated as having moderate-high sensitivity, but it is located on Link 461 reroute alternatives likely to pass near this site.

The inventory of cultural resources recorded along the subroute corridors are dominated by isolated prehistoric lithic sites. More than 55 percent (19 sites) are such isolates, which are assigned a low sensitivity. These isolates typically consist of one or a few pieces of obsidian or chert waste flakes reflecting chipped stone use, but some are more formal tools such as projectile points or scrapers.

More extensive scatters of lithic tools and debris make up about 12 percent of the recorded inventory (four sites), and another four sites are artifact scatters that include lithic artifacts as well as ceramic sherds, including both Fremont gray wares and Shoshone brown wares. These lithic and artifact scatters are assigned a moderate sensitivity.

These isolates, lithic scatters, and artifact scatters make up approximately 80 percent of the recorded cultural resources. Most of these probably reflect prehistoric use of the region, although some may stem from the later ethnohistoric era when Europeans recorded Native Americans living in the area. (Jedidiah Smith is the first documented Euro-American to have crossed through Sacramento Pass in 1827.) The Snake Valley was designated as an ethnohistoric habitation zone. No actual reported camp sites of Shoshone or Goshute, who are reported to have been culturally and linguistically indistinguishable from the Shoshone (Steward 1938:123), have been recorded within the reroute alternative corridors, but the assigned moderate sensitivity reflects the potential for ethnohistoric sites to be present.

Six sites (less than 20 percent of the inventory) are historic sites. These include three trash scatters and a historic corral and chute, all of which are assigned a moderate sensitivity. One of the other two

sites is the historic Eldridge Ranch, which has a standing adobe house that may date from the 1880s and several outbuildings. The other site has concrete foundations and scattered trash and has been identified as the location of a mill associated with early twentieth century mining in the Black Horse District. Both of these particular sites are reported to have compromised integrity, but in accordance with the original methodology they were rated as having moderate-high sensitivity.

Subroute 1

A total of 21 cultural resources have been recorded within a 2-mile-wide corridor along the assumed centerline of Subroute 1. Eleven of these are low sensitivity prehistoric isolated finds, eight are moderate sensitivity sites, including two prehistoric lithic scatters, two prehistoric artifact scatters, the Snake Valley ethnohistoric habitation zone, two historic trash sites, and a historic corral. In addition, a historic ranch and a historic mining mill site, both rated as having moderate-high sensitivity, are located within the Subroute 1 corridor (Table 3-7).

Subroute 2

Twenty-three cultural resources have been previously recorded along the Subroute 2 corridor. Thirteen of these are low sensitivity prehistoric isolated finds. Three are moderate sensitivity prehistoric lithic scatters and four are prehistoric artifact scatters. The moderate sensitivity Snake Valley ethnohistoric habitation zone also is crossed by this subroute. A historic corral, rated as having moderate sensitivity, and a historic ranch, rated as having moderate-high sensitivity, are also within the Subroute 2 corridor.

Subroute 3

Twenty-two of the 23 cultural resources recorded along Subroute 2 are also within the Subroute 3 corridor. The historic ranch site is the one resource not within the Subroute 3 corridor.

Subroute 4

The 2-mile-wide corridor along the Subroute 4 assumed centerline includes 14 previously recorded resources. These include eight prehistoric isolated finds, which are rated as having low sensitivity. One prehistoric lithic scatter and three prehistoric artifact scatters are rated as having moderate sensitivity, as is the Snake Valley ethnohistoric habitation zone and a historic trash site.

It must be remembered that most of these recorded sites are unlikely to be directly affected by the SWIP, and that because of integrity problems many of the specific sites have been evaluated as having less sensitivity than we assigned based on site types. In addition, the numbers of resources largely reflect the degree of prior survey, rather than actual resource densities. To compensate for the lack of inventory data a model was developed to predict sensitivity zones. A total of 5.6 miles of moderate-high sensitivity zones are predicted along Subroute 4, Subroutes 3 and 4 each are predicted to have almost 5 miles of moderate-high zones each, and Subroute 1 is predicted to have 5.9 miles of moderate sensitivity zones, with each of the other subroutes having approximately 4 to 5 miles (refer to Figure 3-12).

In sum, previous research suggests that the Sacramento Pass and Snake Valley area have been occupied for perhaps 10,000 to 12,000 years, first by Paleo-Indians, then Archaic cultures, followed by farming Fremont groups, and then Numic speaking peoples who followed a more nomadic subsistence strategy similar to the Archaic cultures. Euro-American occupation has included episodes of initial exploration, mining, Mormon settlement, and ranching. The mountain pass and relatively abundant water sources have focused human activity in the region, and inventory surveys suggest that cultural resources are likely to be present within all of the alternatives.

Environmental Consequences

Earth and Water Resource

All of the subroutes would cross areas with potentially high sensitivity paleontological resources, although no fossils have been found in the area. With mitigation, no adverse impacts would be expected for paleontological resources.

Generally, the soils in the subroute areas would have low to moderate wind and/or water erosion hazards (refer to Figure 3-6).

Subroute 1

This subroute would cross 5.4 miles of potentially high sensitivity paleontological resources (Links 463, 469, 471). There would be a total of 20.5 miles of low residual impacts for soil erosion along this subroute. This subroute would cross six intermittent streams (Links 463, 469, 471) one perennial stream (Link 471) and 1.8 miles of shallow ground water (Links 471, 473). There is one spring (Link 469) located within 0.5 mile of the assumed centerline of this subroute.

Subroute 2

This subroute would cross 7.1 miles with potentially high sensitivity paleontological resources (Links 464, 465, 469, 471). There would be a total of 21.7 miles of low residual impacts for soil erosion along this subroute. This subroute would cross seven intermittent streams (Links 464, 465, 469, 471), three perennial streams (Link 464, 465, 471), and 1.8 miles of shallow ground water (Links 471, 473). There is one spring (Link 469) located within 0.5 mile of the assumed centerline along this subroute.

Subroute 3

This subroute would cross 6.9 miles of area with potentially high sensitivity paleontological resources (Links 464, 468, 471). There would be a total of 20.7 miles of low residual impacts for soil erosion along this subroute. The subroute would cross 5 intermittent streams crossings (Links 464, 468, 471), three perennial streams (Links 464, 468, and 471), and 1.8 miles of shallow ground water (Links 471, 473). Numerous springs occur in the area but none are located within 0.5 mile of the assumed centerline.

Subroute 4

This subroute would cross 1.3 miles of area with potentially high sensitivity paleontological resources (Links 464, 467). There would be a total of 19.4 miles of low residual impacts for soil erosion along this subroute. This subroute would cross three intermittent streams, (Links 464, 467), three perennial streams (Links 464, 467), and 2.3 miles of shallow ground water (Links 467, 472). There are two springs (Link 467) located within 0.5 mile of the assumed centerline. This subroute would cross 1.2 miles of prime farmland.

Biological Resources

Subroute 1

Wildlife - Impacts to wildlife along this subroute would be low (refer to Figure 3-7). No critical habitat has been identified for big game or raptors and no active raptor nests exist in the area. Antelope utilize the area throughout the year. Five miles of pronghorn habitat and 2.2 miles of antelope kidding grounds have been identified along the links associated with Subroute 1. Although antelope and other big game may avoid the area during the construction period, long-term impacts would be insignificant as antelope use areas where transmission lines currently exist (Gilbertson, personal communication, 1993).

Plants - Four vegetation communities occur along the various links. At higher elevations (Link 463), 0.4 miles of mountain shrub would be traversed. The other links cross 7.7 miles of sage scrub, 0.4 miles of grassland, and 0.4 miles of playa.

Cymopterus basalticus habitat exists along 0.9 miles of Link 463, with at least one known population occurring. *Swertia gypsicola* has the potential to exist along the eastern portion of Link 471 and along Link 473. Mitigation measures would result in low residual impacts to this species if the species is located during preconstruction surveys. A population of *Sclerocactus pubispinus* occurs within the one-mile corridor of Link 463. It is protected by the state Cactus and Yucca Law.

Subroute 2

Wildlife - Impacts to wildlife along this subroute would be low. No critical habitat has been identified for big game or raptors and no active raptor nests exist in the area. Of the area used by pronghorn throughout the year, 5.8 miles have been identified as pronghorn habitat and 2.2 miles are antelope kidding grounds.

Plants - Four vegetation communities would be traversed by the various links. Mountain shrub occurs along link 464 (0.4 miles) at the higher elevations. Sage scrub (8.3 miles), grassland (0.9 miles) and playa (0.4 miles) occur along all the links.

Swertia gypsicola has the potential to exist along the eastern portion of Link 471 and along Link 473. Mitigation measures would result in low residual impacts to this species if the species is located during preconstruction surveys.

Subroute 3

Wildlife - Impacts to wildlife along this subroute would be low. No critical habitat has been identified for big game or raptors and no active raptor nests exist in the area.

Plants - Four vegetation types would be traversed by Subroute 3. Mountain shrub occurs at the higher elevations along link 464 (0.4 miles). The other types are sage scrub (6.8 miles), grassland (0.8 miles), and playa (0.7 miles).

Swertia gypsicola has the potential to exist along the eastern portion of Link 471 and along Link 473. Mitigation measures, which would be applied if it is located during preconstruction surveys, would result in low residual impacts to this species.

Subroute 4

Wildlife - Impacts to wildlife along this subroute would be low. No critical habitat has been identified for big game or raptors and no active raptor nests exist in the area.

Plants - Six land cover types have been identified along these links, including non-irrigated agricultural lands, which is not discussed as a vegetation type. Mountain shrub occurs at the higher elevations along link 464 (0.4 miles). Sage scrub (4.8 miles), grassland (0.8 miles and playa (0.6 miles) occur. Wetland/riparian vegetation types (0.4 miles) occur along Silver Creek, which is traversed by link 467.

Swertia gypsicola has the potential to exist along the eastern portion of Link 467 and along Link 472. Mitigation measures would result in low residual impacts to this species if the species is located during preconstruction surveys.

Land Use

No moderate or high residual impacts would occur along the four subroutes (refer to Figure 3-10).

Subroute 1

This route would cause 1.4 miles of low impacts to land uses where it would cross the Sevier A MOA east of the Utah border (Link 473). As described in the SWIP DEIS/DPA, an agreement specifying the locations where shorter towers would be required along Link 467 and 472 (formerly Link 461) to mitigate potential conflicts with the AGL of the MOA has been negotiated with Hill AFB. Links 471 and 473 would also require shorter towers along a portion of this subroute and may require additional negotiation with Hill AFB.

This subroute would not cross any areas of private land.

Subroute 2

This subroute would have the same impact to land uses as described for Subroute 1.

Subroute 3

This subroute would have the same impact to land uses as described for Subroute 1.

Subroute 4

This subroute would cause 1.6 miles of low impacts to land uses. Links 467 and 472 would cross 1.2 miles of the Sevier A MOA. As described in the SWIP DEIS/DPA, an agreement with Hill AFB specifying the locations where shorter towers may be required along Links 467 and 472 (formerly Link 461) to mitigate potential conflicts with the AGL of the MOA.

This subroute would parallel two existing 230kV transmission lines through 1.2 miles of prime farmland/agricultural areas (Link 472) in Nevada and Utah. Specific tower placement and centerline position would reduce the potential impacts to prime farmland/agricultural land.

Visual Resources

Visual contrasts associated with all of the subroutes would comply with the VRM Class III and IV designations (refer to Figure 3-11).

The potential visual impacts of the crossings of U.S. Highway 6/50 by each of the subroutes is depicted in the photo simulations in Figures 3-14, 3-16, 3-18, and 3-19. Figures 3-13, 3-15, and 3-17 depict the existing conditions along U.S. Highway 6/50.

Subroute 1

High visual impacts would occur to views from the Sacramento Pass Recreation Area (Link 463) for 0.2 miles where this subroute would be visible in the foreground. An additional 1.7 miles of high visual impacts would occur where this subroute (Link 471) would cross a road that provides access to the Mt. Moriah Wilderness, and where it would be visible in the foreground from several rural residences near the Utah-Nevada state line (Link 473). This subroute would also cause 1.4 miles of moderate visual impacts to middleground views.

Travelers on U.S. Highway 6/50 driving west would view steel lattice transmission line towers (Link 463) skylined in the foreground on a ridge to the south of the highway for 0.5 miles (refer to Figure 3-14). Transmission line towers would also be visible to middleground views for 2.0 miles along the highway.

Subroute 2

This subroute (Link 471) would cause 1.7 miles of high visual impacts where it would cross a road that provides access to the Mt. Moriah Wilderness and where it would be visible in the foreground from several rural residences near the Utah-Nevada state line (Link 473).

Travelers on U.S. Highway 6/50 driving east would view a transmission line tower (Link 465) skylined in the foreground on the slope to the north of the highway for 0.5 miles (refer to Figure 3-16). Further, a massive steel lattice transmission line tower at the 90 degree turn (Link 465) would be highly visible in the valley south of the highway. Travelers driving west on the highway would view this subroute in the middleground for approximately 1 mile.

Subroute 3

This subroute (Link 471) would cause 1.7 miles of high visual impacts where it would cross a road that provides access to the Mt. Moriah Wilderness and where it would be visible in the foreground from several rural residences near the Utah-Nevada state line (Link 473).

Travelers on U.S. Highway 6/50 driving east would view steel H-frame transmission line towers (Link 468) for approximately 1 mile where this subroute would parallel the two existing 230kV transmission lines. Travelers driving west would view the transmission line in the foreground to middleground for approximately 1 mile. North of the highway the dark color of the steel H-frame transmission line towers would be viewed against background hills and mountains minimizing visual contrasts (refer to Figure 3-18 and 3-19).

Subroute 4

This subroute (Link 467) would cause 3.1 miles of high visual impacts where it would cross a road that provides access to the Mt. Moriah Wilderness and where it would be visible in the foreground from several rural residences near the Utah-Nevada state line (Link 467).

This subroute (Links 466, 467) would parallel the two existing 230kV transmission lines and would cause weak to moderate visual contrasts in the landscape. Impacts to travelers on U.S. Highway 6/50 would be slightly less than those described for Subroute 3.

Cultural Resources

Although some 14 to 23 cultural resources had been recorded within 2-mile-wide corridors along the four subroutes, the reference centerline of Link 464, which is a component of Subroutes 1, 2, and 4, is the only link to directly cross any of the recorded sites other than the broadly defined ethnohistoric Goshute habitation area that encompasses much of the Snake Valley (refer to Figure 3-12). The assumed centerline of Link 464 crosses a cluster of five prehistoric resources that include two isolated finds of lithic artifacts, two artifact scatters, and a small lithic scatter. This results in a low to moderate impact rating along 2 miles of this link (refer to Table 3-8).

Projected direct construction impacts within the predicted sensitivity zones accumulate to approximately 7 to 9 miles of moderate impacts and 3 to 5 miles of low impacts among the various subroutes (refer to Table 3-8). Impacts ranked as moderate could include disturbance of 7.5 to 12 acres per linear mile in moderate to moderate-high sensitivity zones. Low impacts were defined as disturbance of 6 to 12 acres per linear mile in low to moderate sensitivity zones.

Increases in public accessibility could lead to increased vandalism of cultural resources or attrition of cultural resources during post-construction years as a result of increased recreational use or vehicular

traffic. In general, the areas traversed by the Sacramento Pass subroutes are already accessible and the increase in public accessibility is projected to increase less than 20 percent along most of the subroutes as a result of constructing access roads for the SWIP. Approximately 2 to 3 miles of each of the four subroutes are predicted to experience a 50 to 100 percent increase in accessibility. Because so few known cultural resources are located in the path of the reference centerlines of the subroutes, the projected secondary impacts due to increased accessibility are rated as low to none (refer to Table 3-9).

The final factor considered was the potential for visual intrusions to degrade the integrity of historic properties. Typically such concerns focus on historic buildings or structures whose setting is an important part of their historical values. None of the known cultural resources within the corridors of the Sacramento Pass subroutes were identified as types of properties warranting specific viewshed analysis. The properties that were considered are the Eldridge Ranch House (CR5322) and the Black Horse town site and cemetery (CR80). The Eldridge Ranch House has been recommended as not being significant, and is located along Link 469, which is in terrain where the line would be seldom seen and visual impacts are rated as low. The Black Horse town site and cemetery have been identified as having potential for development as a recreation area, but the reference centerline of Link 463 is more than 2 miles from the town site. The analysis of the viewshed indicates the line is likely to be visible from this distance, but impacts are expected to be low.

Composite impacts scores were computed using the methods described in the SWIP DEIS/DPA (page 4-70) and cultural resources technical report (9-93). Subroute 1 has the lowest composite impact score (42.4), with Subroutes 2 and 3 having the highest (54.8 and 53.8 respectively). The Subroute Comparison yielded a moderate score of 48.7. Therefore, from a cultural resource perspective, Subroute 1 would be preferable over Subroute 4, which, in turn, is preferred over Subroutes 2 and 3. The range of variation among the routes is not great, no high impact zones are projected along any of the subroutes, and all of the potential impacts are likely to be mitigable through minor route modifications or data recovery studies. In sum, cultural resource factors are not a major factor in the selection of alternatives.

Environmentally Preferred Subroute

Subroute 3 is the environmentally preferred subroute. This subroute would not be visible from the Sacramento Pass Recreation Area and would avoid private lands (refer to Figure 3-20 for subroute locations). Although Subroutes 1 and 2 would not be visible from the Sacramento Pass Recreation Area, transmission line towers would be skylined along these subroutes and would cause significant visual impacts on views from U.S. Highway 6/50 (refer to Figures 3-14 and 3-16). Subroute 2 would cross the highway west of the existing 230kV transmission lines creating visual contrasts and impacts along a larger segment of the highway. Subroute 4 would cause similar visual impacts to the highway where it would parallel the existing 230kV transmission lines. However, Subroute 4 would not avoid private lands.

Although high visual impacts to views from the Weaver Creek Scenic Area were identified in the SWIP DEIS/DPA, the BLM no longer manages this area under a special designation and has returned it to multiple-use management. Subsequently, in this analysis, the Weaver Creek Scenic Area was assigned a low sensitivity and no impacts were identified. There would be no high impacts to the Earth, Biological, Cultural, or Land Use resources by the four subroutes analyzed (refer to Figure 3-21 for miles of impact to each resource).

BIOLOGICAL RESOURCES

Introduction

Due to a number of errors in the DEIS/DPA, the entire Biological Resources section is reprinted in this document.

Federal environmental legislation and regulations applicable to biological resources in the project area include the Endangered Species Act of 1973 as amended, the Sikes Act, Title II as amended, Federal Land Policy and Management Act, the Migratory Bird Treaty Act of 1986, the Bald Eagle Act of 1940 (amended in 1962 to include the golden eagle), Section 404 of the Clean Water Act (CWA) (and amendments), Executive Orders 11990 (protection of wetlands) and 11988 (floodplain management), Wild Free-Roaming Horse and Burro Act of 1971, and National Environmental Policy Act (NEPA). NEPA requires federal agencies to prepare environmental impact statements (EIS) on all major federal actions in accordance with Council of Environmental Quality implementing regulations (1978). Additional authority requiring the addressing of biological resources is listed in the technical report.

Affected Environment

Biological resource data for the states of Idaho, Nevada, and Utah were obtained from a secondary (existing) data source for the SWIP regional study conducted by Dames & Moore in 1988 (also refer to Chapter 2). The regional inventory focused on the distribution of highly sensitive species of wildlife and plants and similarly sensitive habitat types. Locations of federally listed species and sensitive habitats were used to select a number of preliminary corridors to be studied further.

Methods

A biological inventory was then conducted for the SWIP alternative routes using data from scientific literature, existing Dames & Moore files, satellite imagery at 1:100,000 scale, SPOT black and white satellite imagery at 1:24,000 scale, and agency contacts. Data was collected within the study corridors one mile on either side of the assumed centerlines for each routing alternative. Agency personnel were asked to provide information on potential or known occurrences of sensitive species of wildlife and plants and on habitats of special concern within the study corridors. The following agencies were contacted for information: the BLM, Forest Service (FS), Fish and Wildlife Service (FWS), Utah Division of Wildlife Resources (UDWR), Nevada Department of Wildlife (NDOW), Idaho Department of Fish and Game, and Idaho, Nevada, and Utah Natural Heritage Programs.

Data were collected and digitized into a Geographic Information System (GIS) at a 1:100,000 scale for:

- vegetation types
- common and characteristic plant species found in each vegetation type
- vertebrate species likely to be found in habitats in the project area
- species listed as federally threatened, endangered or as candidates under review for listing

- species classified as rare, sensitive or otherwise protected by state agencies
- areas of special biological value or interest, including riparian and wetland habitats

The technical reports contain detailed information on the vegetation and wildlife resources inventoried. The results of the biological resources inventory are summarized below.

Results

Vegetative Communities

Twelve vegetative communities have been identified within the SWIP biological study area. Satellite imagery facilitated the identification and distribution of vegetation (refer to Map Volume). The imagery was "classified" using a computer to distinguish various spectral qualities, or light reflectivity from the ground surface digitally recorded by a satellite. Since the spectral qualities of some communities were similar on the satellite images, the various communities were mapped into several vegetation types, and are described below.

Shadscale, greasewood, samphire-iodine bush, and Great Basin sagebrush are all included under sage scrub. Mojave desertscrub and grassland communities are both uniquely identified. Wetland and riparian areas are listed under riparian. Piñon-juniper and alpine tundra are represented by woodland/mountain shrub/grasses. Limber/bristlecone pine and quaking aspen are represented by the mountain conifer/broadleaf category.

Agriculture - This is most prevalent in the Snake River plain in southern Idaho where native vegetation has been cleared for agricultural purposes (i.e., Links 10, 20, 40, 41, 61, 62, and 63). Refer to the Land Use section in the DEIS/DPA and the Landcover maps in the Map Volume accompanying the DEIS/DPA for locations.

Grassland - Grassland communities occur throughout the alternative corridors, largely ecotonal with other plant communities, such as sage scrub (Links 71, 91, 92, 100, 110, 130, 160, 141, 142, 144, 152, 161, 200, 211, 221, 243, 259, 260, 270, 362-63, 420, 430, 450, etc.) and piñon-juniper (Links 263, 264, 280, 350), but are often present as discrete grassland units. Many native species have been replaced historically during land management practices by exotics, such as cheatgrass brome (*Bromus tectorum*), crested wheatgrass (*Agropyron cristatum*), filaree (*Erodium cicutarium*), tumble mustard (*Sisymbrium altissimum*), and Russian thistle (*Salsola iberica*). Native species include gramas (*Bouteloua* spp.), bluegrasses (*Poa* spp.), needlegrasses (*Stipa* spp.), galleta (*Hilaria jamesii*), sand dropseed (*Sporobolus cryptandrus*), Indian ricegrass (*Oryzopsis hymenoides*), and squirreltail (*Sitanion hystrix*).

Sage Scrub - The four distinct communities categorized under sage scrub are described below. The most common is Great Basin sagebrush, the other three have more specialized habitat requirements. Very few links cross sage scrub exclusively (e.g., Links 70, 300, 310, and 320), most being ecotonal with grasslands (links listed above).

- **Great Basin Sagebrush Community** - On low foothills at somewhat higher elevations, big sagebrush reach down to make contact with playa chenopods, and upward along ridges and in valley bottoms to mingle with piñon-juniper woodlands. In addition, portions of this community extend well above piñon-juniper to cover rocky ridges and

valleys at elevations as high as 10,000 feet. At higher elevations, soils are rocky and less dense, the water table is lower, and soils are free of salts. Vegetative cover is between 20 and 50 percent. Within this community, mountain mahogany (*Cercocarpus ledifolius*) occurs locally on south-facing slopes in dense stands. At higher elevations, quaking aspen (*Populus tremuloides*), Douglas fir (*Pseudotsuga menziesii*), and white fir (*Abies concolor*) may occur given moister climates. Limber pine (*Pinus flexilis*) and spruce (*Picea* spp.) occur in some parts of Nevada.

- **Shadscale Community** - Shadscale (*Atriplex confertifolia*) occurs in low elevation, often saline basins typified by low precipitation, heavy soils, and a water table too deep to support stands of greasewood. This shrub-dominated community normally has cover values of less than 12 to 15 percent, and plants that are often less than one meter in height.

- **Greasewood Community** - Greasewood (*Sarcobatus vermiculatus*) occurs in saline soils along the edges of playas where the water table is high. Salts from the soils are drawn in solution into the plant, the leaves drop off and rot causing a highly alkaline habitat in which only specialized, salt tolerant plants can survive. Vegetative cover in greasewood communities is usually less than 10 percent.

- **Samphire-Iodine Bush Community** - This community occurs where the combination of high water table and high soil salt content is so great that water often stands in pools of low playas and dense crusts of salt crystals form on soil surfaces and on the bases of plants.

Mojave Desertscrub Community - This community is found on the basin floors and bajadas below 4,000 feet. South of the Pahranagat Mountains and at the north end of Kane Springs Valley in Nevada, a transition to Mojave desertscrub vegetation occurs (e.g., Links 680, 690, and 700). Creosotebush (*Larrea tridentata*) is the most abundant plant, with white bursage (*Franseria dumosa*) as a codominant. Blackbrush (*Coleogyne ramosissima*) is common at higher elevations. Joshua trees (*Yucca brevifolia*), all-scale (*Atriplex hymenoclea*), desert holly (*A. hymenelytra*) and brittlebush (*Encelia farinosa*) occur locally.

Woodland/Mountain Shrubs/Grasses - Piñon-juniper and the alpine-tundra community are two distinct vegetation types represented by this category.

- **Piñon-Juniper** - In areas of generally higher elevations (5,000 to 8,000 feet) and steeper slopes, piñon-juniper woodlands dominate the upper foothill landscape. These woodlands or "pygmy forests" are limited along alternative links at higher elevations, primarily intermingling with grasslands and sage scrub (e.g., Links 263, 264, 280, 350, 364, and 460). In many areas, this vegetation type runs continuously from mountain range to mountain range. Annual precipitation in these sites varies greatly. Soils are often rocky, shallow, and poorly defined. Plant cover is often less than 15 percent with most of that existing as upper canopy cover. Grasses, forbs, and woody plants are limited. The most common woody plant is singleleaf piñon (*Pinus monophylla*). Where juniper (*Juniperus osteosperma*) dominates, neither singleleaf piñon nor piñon pine (*P. edulis*) occur within the study corridors in southern Idaho.

- **Alpine-Tundra Community** - Above timberline, at elevations exceeding 11,000 feet, low-growing, perennial herbs are virtually the only plant types present. Woody plants are rare or non-existent.

Mountain Conifer/Broadleaf - Two distinct high elevation communities, limber pine - bristlecone pine and quaking aspen, are represented by this category.

- **Limber Pine-Bristlecone Pine** - This high elevation community occurs between 8,000 and 10,000 feet of elevation. Common tree species are white fir (*Abies concolor* var. *lowiana*), bristlecone pine (*Pinus longaeva* var. *aristata*), and limber pine (*P. flexilis*). This vegetative community has not been specifically identified along any of the links.

- **Quaking Aspen** - Occurring at elevations ranging from 6,000 and 8,000 feet, quaking aspen are often found growing in pure stands. Understory conifers generally will eventually grow and shade out the aspen.

Riparian - Riparian areas are encountered infrequently within the alternatives, generally occurring in narrow communities along streams and marshes. Streams in the region traversed by the SWIP alternatives originate from perennial headwater spring sources or from snowmelt which creates numerous ephemeral and a few perennial streams. Typical intermountain vegetation along these waterways is comprised of cottonwoods (*Populus* spp.), willows (*Salix* spp.), dogwood (*Cornus* spp.), wild rose (*Rosa* spp.), birch (*Betula* spp.), chokecherry (*Prunus* spp.), and alder (*Alnus* spp.) (Links 241, 244, 245, 261, 267, 291, 292, and 620). A unique variety of swamp cedar (*Juniperus scopulorum*) exists in three known locations including the White River Valley (Link 670) and Spring Valley (Link 380). Climate and elevation will determine which species are present.

Wetlands - Wetlands are also present in the form of marshes and wet meadows within portions of the study area, primarily at lower elevations.

Other Natural Land Cover - Other categories of land cover that have been identified by satellite imagery are natural bare soils and playas. Natural bare soils occur along valleys, in dry areas, dunes, and those areas where vegetation is very sparse. Playas are dry lake beds, often with high mineral content. During wet years, playas, or alkali flats, may provide important habitat for waterfowl and shorebirds. They also represent potential nesting sites for the snowy plover (*Charadrius alexandrinus nivosus*), a federal Category 2 candidate species for listing among the threatened or endangered wildlife of the United States. A majority of the playas are located in Utah with a few scattered in Nevada (e.g., Links 190, 223, 230, 490, 500, 510, 520, 572, 290). None of the links are exclusively within a playa.

Wildlife

Approximately 560 species of vertebrates are likely to occur, over the course of a year, in habitats traversed by alternative corridors. These species are listed in Tables BIO-10 through BIO-15 of the technical reports (refer to Appendix H of the DEIS/DPA for the locations where technical reports can be reviewed).

Seventy species of fish are known to occur within aquatic habitats in the project area (refer to Tables BIO-10, BIO-11, BIO-12 of the technical reports). Native and introduced game fish are present in warm and cold water lakes, ponds and reservoirs, and in perennial streams and rivers. Others inhabit

hot and cold springs, and marshes. Approximately 31 percent of the fish fauna occupying waters in the project area are introduced.

Fifteen species of amphibians are expected to occur in aquatic, riparian, and wetland habitats in the project area. Sixty-two species of reptiles potentially occur in terrestrial habitats within the study corridors (refer to Table BIO-13 of the technical reports).

The Biological Resources Technical Report (Table BIO-14 of the technical reports) lists 316 species of birds that potentially occur within habitats in the project area. Of these 109 are most likely to occur in lower elevation swamp/slough areas and 109 (some overlap) are riparian species. Grasslands are habitat for approximately 62 different species and the sagebrush community hosts 81 species. Approximately 71 of the 316 bird species are permanent residents of the area and 143 are summer breeding residents. The remainder are likely to occur only during spring and/or fall migration periods, with a few winter residents.

A total of 111 species of mammals are expected to occur within habitats traversed by the alternative routing corridors of the SWIP (refer to Table BIO-15 of the technical reports). Small mammals including rodents, lagomorphs (rabbits and hares), bats, and shrews are the most numerous, although not readily observed. Over one half of the mammals that may occur in the project area are rodents (51 species). Large mammals include 19 species of carnivores and five species of native ungulates.

Approximately 34 species of vertebrates are not native to the region, introduced through accidental or intentional human activities.

Agencies responsible for wildlife management identified several species of wildlife as being of particular concern. These included the species listed below. More information is provided in the Special Status section and alternative routes descriptions.

Wild Horses and Burros - Free-roaming horses (*Equus caballus*) and burros (*E. asinus*) occur on public lands in the project area. These animals are descendants of horses and burros that escaped from man or were turned out onto the open range. Wild Horses are extremely mobile, readily moving great distances across public lands. They are fairly widespread throughout the northeastern part of Nevada and adjacent Utah. The BLM has established a number of management areas specifically for wild horses (also refer to Herd Management Areas in Chapter 3 of this document).

Gila Monster (*Heloderma suspectum*) - The range of the Gila monster in the United States includes the tip of southern Nevada, the southwestern corner of Utah, all of southern and southwestern Arizona, extreme southwestern New Mexico, and extreme southeastern California (Stebbins 1985). In the Mojave Desert, the Gila monster occurs primarily in Mojave desertscrub, but can also be found in lower most limits of juniper woodlands. They are more common in rocky habitats compared with the drier and sandier floors. Gila monsters are not uncommon, but are seldom seen since they spend most of their time underground (Lowe et. al 1986). They dig their own burrows or occupy those made by other species, such as desert tortoises (Stebbins 1985, Lowe et. al 1986). Gila monsters feed on small mammals, reptiles, lizards, carrion, and eggs, primarily of ground nesting birds (Stebbins 1985). This species is likely to occur in the vicinity of Links 690, 700, and 720. The Gila monster is a federal Category 3C species, and has protected status in Nevada.

Desert Bighorn Sheep - (*Ovis canadensis nelsoni*) - Desert bighorn sheep remain in several mountain ranges in Clark, Lincoln, and Nye counties, Nevada. These mountains include the Las Vegas, Sheep, Hiko, and Arrow Canyon ranges, and the Delamar and Meadow Valley mountains. They also occur in

the South Egan Range in White Pine County. There has been concern expressed for disruption of bighorn sheep movement and use of water sources.

Desert Tortoise - (*Gopherus agassizii*) - In recent years, dramatic declines in tortoise population numbers have been observed throughout much of its range, including southern Nevada. A number of factors have contributed to the observed decline including disease, loss of habitat to development, degradation of habitat from livestock grazing, predation on juveniles by ravens attracted to areas where human refuse accumulates, illegal collection, and off-road vehicle (ORV) use. The Mojave population of the desert tortoise was formally listed as a federally threatened species by the FWS in April 1990. Concern has been expressed for the maintenance of viable populations in Clark County, Nevada, and especially the Las Vegas Valley where rapid commercial and residential development is occurring. As a result of these urban developments affecting desert tortoise, a Habitat Conservation Plan is being developed to minimize, monitor, and mitigate impacts to tortoises in the larger Clark County region. The plans currently identify the Coyote Spring Valley as a priority area for preservation of the species (Regional Environmental Consultants 1991). Desert Tortoise do not occur in Idaho or in the Utah portion of the SWIP.

Sage Grouse - (*Centrocercus urophasianus*) - Declines in sage grouse numbers are largely associated with destruction of sagebrush habitat. Conversion of sagebrush to agricultural lands and attempts to convert sagebrush areas to grassland for livestock grazing are a few of the human developments contributing to the decrease in grouse numbers. There has been concern expressed by state and federal agency biologists for other activities that would further impact the sage grouse populations.

Aquatic/Riparian Habitats

Idaho - Important aquatic/riparian habitats traversed by the SWIP alternatives or located in close proximity to project alternatives including the Snake River, Salmon Falls Creek and Reservoir, Little Wood River, Deep Creek, Cottonwood Creek, Goose Lake, Wilson Lake Reservoir, and Deep Creek Reservoir.

Nevada - Aquatic/riparian habitats traversed by the SWIP alternatives or in close proximity to project alternatives include the Humboldt River and tributaries, Salmon Falls Creek, Trout Creek, Shoshone Creek, Thousand Springs Creek, Bishop Creek and Reservoir, Duck Creek, Steptoe Creek and associated springs, Bassett Lake, Spring Valley Creek, the White River, Ellison Creek, Forest Home Creek, Whipple and Tule Field Reservoirs and Goshute Creek.

Several wetland areas traversed by the SWIP alternatives serve as nesting and wintering grounds for waterfowl and bald eagles. These occur in areas of Spring Valley, Steptoe Valley, White River Valley and Bassett Lake. Wetlands associated with Bassett lake are nesting habitat for white-faced ibis, long-billed curlew, and sandhill crane.

Natural springs and streams which are habitat for a number of sensitive fish species include Goshute Creek, Duck Creek, and associated springs of Steptoe Valley, Spring Valley Creek , and associated springs of Spring Valley, the White River, and springs of White River Valley and Town Creek.

Utah - Significant aquatic/riparian habitats that occur within the SWIP alternatives in Utah include the Sevier River and tributaries, Sevier Lake, Topaz Slough, Crafts Lake, Baker Creek, Jensen Spring, Rocky Knoll Spring, Coyote Spring, Gandy Salt Marsh lake, Leland-Harris Spring Complex, and Miller Spring.

Leland-Harris Spring Complex and Miller Spring occur within several miles of Link 63 in Snake Valley. These areas are habitat for four sensitive species: the desert dace, least chub, spotted frog, and Great Basin silver spot butterfly. The latter three are candidates (Category 2) for federal listing as threatened or endangered.

Special Status Species - Plants

Seventy-three plant species, which occur or potentially occur along proposed corridors, have been identified as sensitive on the state and/or federal level (refer to Tables BIO-16, 17, and 18 in the technical report). There are no known plant species occurring within the SWIP corridors that are presently listed as endangered on the federal level. One recently listed as threatened is unlikely to occur in the study area. Candidate species in the area include two that are Federal Category 1 (C1), 32 are Federal Category 2 (C2), and 35 are recommended for deletion Federal Category (C3). C1 means that substantial information exists to support proposing the species for listing as threatened or endangered, and a listing proposal is being or will be prepared. C2 indicates that listing of a species may be appropriate when additional information is gathered. The C3 category means that species that were once considered for listing are no longer being considered.

The listing used was the Federal Register 50 CFR Part 17, Wednesday, February 21, 1990. Most are found on at least one state list of species of concern. Although many of the species are not legally protected by the Endangered Species Act, they are protected by federal agency policies and regulations.

Known locations of 31 of the 73 plant species occur along, or within one mile, of alternative routes. The low number of known plant locations in the area is more likely a function of the lack of field research and does not preclude the existence of additional species.

Idaho - Seventeen sensitive plant species have been identified as occurring or potentially occurring within the SWIP corridors in Idaho. According to the most recent data available, none of these species is currently listed as threatened or endangered on the federal level. Of the sixteen species, three are federal Category 2 and one is C3. The State of Idaho identifies various levels of sensitivity as discussed below. Table BIO-16 in the Technical Report lists these 17 plants.

Four plants are classified as C2 on the federal level. One species of milk-vetch, Mulford's milk-vetch (*Astragalus mulfordiae*), is known from several counties, including Owyhee County (Moseley and Groves 1990). It grows on well-drained, deep, sandy soils on south-facing slopes (Rosentreter 1990). Mourning milk-vetch (*A. atratus* var. *inseptus*) is endemic to the mid-Snake River Plains of southern Idaho on flats, plains, and gentle slopes. Davis' peppergrass (*Lepidium davisii*) occurs along internally drained, hard-bottomed playas. These playas are often used for stock watering ponds and race tracks. Montane peppergrass (*L. montanum* var. *papilliferum*), known from Owyhee County can tolerate harsh conditions where other plants are unable to take root (Rosentreter 1990).

The categories used to identify state sensitive species are defined by The Idaho Native Plant Society. One species, wovenspore lichen (*Texosporium sancti-jacobi*), is considered state priority 1. It is part of an effort to identify rare non-vascular plants in Idaho (Moseley and Groves 1990). Only recently found in Idaho, it grows on decomposed grasses and on the underside of very old rabbit pellets where humidity is high (Rosentreter 1990).

Two-headed onion (*Allium anceps*), four-wing milk-vetch (*Astragalus tetrapterus*) and dimersia (*Dimersia howellii*) are listed as State Priority 2. Two-headed onion requires moist habitat and areas that are inundated in the spring. Four-wing milk-vetch is found in association with piñon-juniper at elevations of 3,500 to 6,500 feet. It is known from one site in Twin Falls County, Idaho and is being threatened by off-road vehicles and trampling. Dimersia is known from a limited number of sites in Owyhee County.

Owyhee morning milk-vetch (*Astragalus atratus* var. *owyheensis*) is a state sensitive species. Generally found on steep hillsides and flats over basalt, it is often entangled under sagebrush. Threats include range improvement and agricultural development. Other state sensitive species are Torrey's blazing star (*Mentzelia torreyi* var. *acerosa*), and thistle milk-vetch (*Astragalus kentrophyta* var. *jessiae*), known from a limited number of sites in southern Idaho. Large-flowered gymnosteris (*Gymnosteris nudicaulis*) and small-flowered gymnosteris (*G. parvula*) occur within the Shoshone District, BLM and may occur along proposed corridors (Popovich 1992). Large-flowered gymnosteris is on the BLM and state sensitive species lists. It grows on open, sandy places in the plains and foothills. Small-flowered gymnosteris, a review species on the state list, grows on open, dry to moderately moist slopes, flats, and drier meadows from the foothills to above timberline.

Webber's needlegrass (*Stipa webberi*) is more common than previously known and was recently de-listed (Popovich 1992).

Two species being monitored at the state level are Murphy milk-vetch (*Astragalus mulfordiae*) and white eatonella (*Eatonella nivea*).

Two species are Category 3. Picabo milk-vetch (*Astragalus oniciformis*), a BLM sensitive species was thought to be extinct (University of Idaho 1980), however, populations have been found on the Shoshone District of the BLM (Popovich 1992). Murphy milk-vetch (*A. camptopus*), found in arid, sandy soils of southeastern Idaho in association with shadscale (Clark 1989). A primrose (*Primula cusickiana*), is currently undergoing taxonomic review and has no status at this time.

Nevada - Forty-four plant species in Nevada have been identified by various agencies as requiring special consideration (Table BIO-17 in the Technical Report). Status information on the state level is from "Endangered, Threatened and Sensitive Plants of Nevada" updated February 13, 1989. There are no federally-listed endangered plant species known to occur or potentially occur within the SWIP corridors in Nevada. One plant listed as threatened has most likely been extirpated from the Great Basin.

Ute, or plateau, lady's tresses (*Spiranthes diluvialis*) historically occurred in Nevada. This species is supported by moist soils in mesic or wet meadows along springs, bogs, or open-seepage areas in cottonwood, tamarix, willow, and piñon-juniper associations at 4,400 to 6,810 feet in elevation. It was last collected in 1936 in Meadow Valley Wash east of the proposed corridors near Panaca, Nevada.

Monte Neva paintbrush (*Castilleja salsuginosa*) is a Category 1 species and critically endangered on the state list. It is found at Monte Neva Hot Springs in Steptoe Valley. Sand-loving buckwheat (*Eriogonum argophyllum*) is listed as Category 1 on the federal level, and critically endangered on the state level. It is located in the Ruby Valley area (Lindsey 1989).

Clokey milk-vetch (*Astragalus aequalis*) is a C2 species, recommended as threatened by the Northern Nevada Native Plant Society (NNNPS). It is found on gravelly hillsides and ridges at elevations ranging from 5,900 to 8,400 feet. Three-cornered pod Geyer milk-vetch (*Astragalus triquetrus*) is a

C2 species, listed as threatened by NNNPS (1989) and critically endangered by the State of Nevada. It grows in sandy soils on dunes or in washes. Known locations are along the southern extension in the Dry Lake Valley.

There are 15 species on the federal Category 2 list, which are also on the NNNPS watch list. Exact locations for most of these are unknown, although habitats supporting known populations are similar to those traversed by the SWIP corridors. Therefore, the potential for occurrence of several different species of concern exists. Sunnyside green gentian (*Frasera gypsicola*), a C2 species, is a mound-forming plant found within remnant playas. Known locations include White Pine and Nye counties. Welsh's catseye (*Cryptantha welshii*) is the C2 species with the highest potential for occurrence (Walker 1989). It has been located in Jake's Valley and is likely to be found within one mile of the proposed corridor due to similar habitat types.

Those Category 2 species with moderate potential for occurring along proposed corridors include maguire lewisia (*Lewisia maguirei*) and Blaine's pincushion (*Sclerocactus blainei*). Maguire lewisia is found on loose soils associated with piñon-juniper at elevations of 7,500 to 7,800 feet. Blaine's pincushion is currently not well documented. It is found in association with greasewood-shadscale. The Cactus and Yucca Law would apply to any found in the affected area. Jan's catchfly (*Silene nachleringae*), another newly described species, is found at elevations above 9,500 feet with subalpine vegetation.

Long calyx milk-vetch (*Astragalus oophorus* var. *lonchocalyx*) has low to moderate potential for occurrence (Walker 1989). It is located on dry, gravelly hillsides in association with piñon-juniper and sagebrush.

There are five species with low potential for occurrence. Eastwood milkweed (*Asclepias eastwoodiana*) is found on low alkaline clay hills away from other plants. Peck station milk-vetch (*Astragalus eurylobus*) grows in semi-badland sites with Utah juniper and black sagebrush. Currant milk-vetch (*A. uncialis*) is found on dry knolls and slopes at elevations of 5,300 to 6,500 feet. Sheep fleabane (*Erigeron ovinus*) grows on rocky outcrops at elevations exceeding 6,500 feet. Tuffed globemallow (*Sphaeralcea caespitosa*) is found on gravelly limestones with mixed shrub and piñon-juniper grass communities.

Seven additional C2-listed species include several which are newly described, making it difficult to discern the actual sensitivity of the species. The following descriptions are based on available information. Elko rock-cress (*Arabis falcifructa*) is found in barren or sparsely vegetated areas in Elko County and is of concern in the Wilkins area (BLM 1990). Grouse Creek rock-cress (*A. falcatoria*), also in Elko County, is found in high elevation coniferous forests. Goose Creek milk-vetch (*Astragalus anserinus*) is located in Elko County on undeveloped soils along Goose Creek and at Thousand Springs (BLM 1990). Broad fleabane (*Erigeron latus*) is found on gravelly or rocky hillsides. Not enough is known about this species to make definite statements about its sensitivity (USDI, BLM 1989). Arching pussytoes (*Antennaria arcuata*) grows in meadows that are not permanently wet and in riparian areas. Lewis buckwheat (*Eriogonum lewisii*), is known on gravelly steep slopes. Barren valley collomia (*Collomia renacta*) is found in "badland areas" and is of concern in the Pequop Summit area (BLM 1990).

Six C2 species exist which may occur on the southern extension to Las Vegas. Merriam or white bear poppy (*Arctomecon merriami*), found on shallow gravelly soils, is threatened by land development. Golden bear poppy (*A. californica*), considered critically endangered by the State, is found in gravelly desert flats in association with creosotebush. Alkali mariposa (*Calochortus striatus*) is found in alkali

meadows in association with saltgrass. Beaverdam breadroot (*Pediomelum castoreum*), recently listed (January 1992) is known to occur in sandy gravels of the Mojave Desert, especially along Kane Springs Wash (Link 680). Two subspecies of penstemon (*Penstemon bicolor* var. *bicolor, P. bicolor* var. *roseus*) occur next to the Dry Lake Substation site in the Dry Lake Valley. Both are known from shallow, gravelly soils and appear to survive in disturbed areas (Mozingo 1980). The first variety is a watch species. The latter is recommended for deletion on the state level.

Blaine's pincushion, Clokey pincushion (*Coryphantha vivipera* var. *rosea*), and Great Basin fishhook (*Sclerocactus pubispinus*) are three species of cactus specifically listed. All species of cactus and yucca are protected by The Cactus and Yucca Law, Nevada State Law (Revised Statutes 527). There are known populations of Great Basin fishhook along several of the links in the eastern part of the state. The proposed corridors may cross some healthy populations of cactus or yucca.

Eleven of the species identified are listed as 3C on the federal level. Habitat descriptions are given in Appendix C.

Two tree species merit mentioning. Bristlecone pine (*Pinus aristata*) occurs in eastern Nevada, found on dry, rock slopes and ridges of high mountains at elevations exceeding 7,500 feet. They are classed among the oldest known living plants and can provide important historical information. Additionally, a rare variety of juniper, known as swamp cedar (*Juniperus scopulorum*), occurs in White River Valley east of one link.

Utah - Fourteen species of sensitive plants that are known to occur, or have the potential to occur, within the corridors of the SWIP (Table BIO-18 in the Technical Report). According to the most recent data available, none of these species is listed as endangered on the federal or state level.

Ute, or plateau, lady's tresses (*Spiranthes diluvialis*) historically occurred in the Great Basin. This species is supported by moist soils in mesic or wet meadows along springs, bogs, or open-seepage areas in cottonwood, tamarix, willow, and piñon-juniper associations at 4,400 to 6,800 feet in elevation. None of the historical locations were within the proposed corridors and many of these populations have evidently been extirpated with the exception of some near Utah Lake.

Nine species are C2 on the Federal level. Compact catseye (*Cryptantha compacta*), recently downgraded from a C1 species, is found within Millard County in association with desertscrub and grassland. Sunnyside green gentian (*Swertia*=[*Frasera*] *gypsicola*) is considered extremely rare globally and statewide (Young 1989). Known locations include Millard County. Sand-loving buckwheat (*Eriogonum ammophilum*), associated with desertscrub, most likely occurs within the SWIP corridors. Frisco clover (*Trifolium andersonii* var. *friscanum*) is an S1 (S3) species, with this particular subspecies considered rare. It is found at elevations of 7,000 to 7,500 feet in association with piñon-juniper in Millard County.

Known locations of currant milk-vetch (*Astragalus uncialis*) exist near Delta, Utah. This species is found on dry knolls and slopes in limestone-derived soils. Depressed bitterweed (*Hymenoxys depressa*) is undergoing taxonomic recombination resulting in a more extended range than previously defined (Boyce 1989). It is found in association with black sagebrush. Tunnel Springs beard tongue (*Penstemon concinnus*) is known to occur in Millard County, although it may be south of proposed corridors. Jones globemallow (*Sphaeralcea caespitosa*) has been identified as occurring within a proposed corridor (USDI, BLM 1989). It is found on calcareous soils in association with mixed shrub and piñon-juniper communities at elevations of 5,000 to 6,500 feet.

The remaining five plants listed are categorized as 3C which indicates that they are no longer candidates for listing because they are more abundant than previously believed or have no federal status. They should still be taken into consideration, as the State of Utah lists several of them as species of concern. Calloway milk-vetch (*Astragalus callithrix*) and terrace buckwheat (*Eriogonum natum*) are listed as S2. Their ranges include Millard County. Limestone buckwheat (*E. eremicum*) and Great Basin pincushion (*Sclerocactus pubispinus*) have not been ranked on the state level yet. Both are found in Millard County. Transmission lines are listed as a threat to limestone buckwheat, and harvesting for horticultural purposes threatens the Great Basin pincushion. Low beard tongue (*Penstemon nanus*) is found in Juab, Millard, and Tooele counties.

Special Status Species - Wildlife

The FWS and the states of Idaho, Nevada, and Utah have all devised codes for defining the extent of rarity and level of threat to biotic taxa that are included on species lists maintained by each governmental entity. Definitions of these codes may be found in the technical reports. Concern for the species discussed below has been expressed by agencies contacted during the biological resource inventory.

Idaho - Federally-listed wildlife species known to occupy habitats within the study corridors include the bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus anatum*). Refer to Table BIO-19 in the technical reports for a list of special status wildlife species in the project area in Idaho.

Candidates for federal listing (Category 2) include one species of fish, the Shoshone sculpin (*Cottus greenei*) and five species of birds: ferruginous hawk (*Buteo regalis*), Swainson's hawk (*Buteo swainsoni*), loggerhead shrike (*Lanius ludovicianus*), western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), and white-faced ibis (*Plegadis chihi*). The spotted bat (*Euderma maculatum*) is the only candidate species of mammal known to occur in the project area in Idaho. The long-billed curlew (*Numenius americanus*), a fairly common species in the project area, has recently (FWS, 1991) been downgraded to Category 3C, taxa that have been shown to be more abundant than previously thought. The FWS has also recently (1992) found that a petition to list the ferruginous hawk among the threatened or endangered wildlife of the United States was not warranted.

Species identified as sensitive or of concern to state agencies are sage grouse (*Centrocercus urophasianus*), burrowing owl (*Athene cunicularia*), and pronghorn (*Antilocapra americana*).

No specific locations of habitat for Swainson's hawk, yellow-billed cuckoo, white-faced ibis or spotted bat were identified within the study corridors. Although other species mentioned above occur within the SWIP study corridors, no specific locations of nests and/or crucial habitats were identified, with the exception of Shoshone sculpin and sage grouse strutting grounds.

Nevada - Federally-listed species identified within the study corridors include the desert tortoise (*Gopherus agassizii*), White River spinedace (*Lepidomeda albivallis*), bald eagle, and peregrine falcon. See Table BIO-20 in the technical reports for a detailed list of special status wildlife species in the project area in Nevada. The desert tortoise, bald eagle and peregrine falcon were included in the Biological Assessment (refer to Biological Opinion in Appendix C) prepared for the SWIP.

Candidates for federal listing (Category 2) in the project area in Nevada include four butterflies, the Baking Powder Flat blue butterfly (*Euphilotes battoides* spp.) and Mattoni's blue butterfly (E.

pallescens mattoni), White River wood nymph butterfly (*Cercyionsis pegala* spp), and Steptoe Valley crescent spot butterfly (*Phyciodes pascoensis*). Candidate fish species include: White River desert sucker (*Catostomus clarki intermedius*), White River speckled dace (*Rhinichthys osculus* spp.), Pahranagat speckled dace (*R. o. velifer*), Lahontan speckled dace (*R. o. robustus*), Preston White River springfish (*Crenichthys baileyi albivallis*), relict dace (*Relictus solitarius*), and Bonneville cutthroat trout (*Salmo clarki utah*).

One species of amphibian, the Arizona (southwestern) toad (*Bufo microscaphus*), and one species of reptile, the chuckwalla (*Sauromalus obesus*), are classified as a federal Category 2 species.

Category 2 bird species include ferruginous hawk, Swainson's hawk, western snowy plover (*Charadrius alexandrius nivosus*), western yellow-billed cuckoo, and white-faced ibis. The FWS has received a petition requesting the listing of the ferruginous hawk as a threatened species. This species is included in the Biological Assessment prepared for the SWIP.

Category 2 mammal species identified in the project area are the spotted bat (*Euderma maculatum*) , Desert Valley kangaroo mouse (*Microdipodops megacephalus albiventer*), Sierra Nevada red fox (*Vulpes vulpes necatur*), North American wolverine (*Gulo gulo luscus*), and North American lynx (*Felis lynx canadensis*).

Species classified as sensitive or of concern to state agencies include burrowing owl, sandhill crane (*Grus canadensis*), sage grouse, golden eagle (*Aquila chrysaetos*), Gambel's quail (*Lophortyx gambelii*), bighorn sheep (*Ovis canadensis*), pronghorn, elk, and mule deer (*Odocoileus hemionus*).

The breeding range of the loggerhead shrike occurs throughout the study area. The chuckwalla (*Sauromalus obesus*) is a resident of Mojave desertscrub communities. Chuckwallas prefer rocky hillside areas, particularly lava flows. Link 720 traverses chuckwalla habitat in the Arrow Canyon Range. Both species are Category 2 candidates for federal listing.

The burrowing owl is a species of concern to the NDOW. Burrowing owls occur in Mojave desertscrub habitat and, therefore, could occur on Links 690, 700, and 720. Burrowing owls often use desert tortoise burrows and could be found throughout all tortoise habitat.

No locations of habitat were identified within the SWIP study corridors for the following: Arizona toad, western snowy plover, yellow-billed cuckoo, white-faced ibis, Desert Valley kangaroo mouse, spotted bat, red fox, wolverine, lynx, White River springfish, White River spinedace, or Mattoni's and Baking Powder Flat blue butterflies. The White River wood nymph butterfly is known to occur in wetlands near the center of the White River Valley near the White Pine-Nye County lines, in the vicinity of Link 669. The Steptoe Valley crescent spot butterfly is known from wetlands near the Monte Neva Hot Springs in the Steptoe Valley (on Link 291).

Utah - Two federally-listed species occur in the project area in Utah, the bald eagle and peregrine falcon. Refer to Table BIO-21 in the technical reports for list of special status wildlife species in the project area in Utah.

A number of species are candidates for federal listing (Category 2). These include invertebrates such as the Great Basin silver spot butterfly (*Speyeria nokomis nokomis*) and a Category 2 species of amphibian, the western spotted frog (*Rana pretiosa*). Category 2 fish species include the Bonneville cutthroat trout, and least chub (*Iotichthys plegethonti*s).

Category 2 bird species occurring in Utah are the ferruginous hawk, Swainson's hawk, western snowy plover, western yellow-billed cuckoo, and white-faced ibis. Only one Category 2 mammal species, the spotted bat, is known to occur in the project area in Utah.

Species identified as sensitive or of state concern include the golden eagle, pronghorn, and mule deer.

No specific locations of habitat were identified within the SWIP corridors in Utah for bald eagle, peregrine falcon, Swainson's hawk, western yellow-billed cuckoo, white-faced ibis and spotted bat.

Midpoint to Dry Lake Segment

Route A

Wildlife - From the Midpoint Substation to the Idaho-Nevada state line (Links 10, 20, 40, 41, 50, and 70) near Eden, Hansen, and Rogerson would traverse habitat for burrowing owls, long-billed curlew nesting populations, ferruginous hawks and pronghorn in Idaho. Sage grouse leks and wintering grounds would also be north of Jackpot, Nevada (Link 70).

Numerous links on the route segment from Jackpot to Robinson Summit would traverse crucial big game habitats including pronghorn winter range from Jackpot to southwest of Wilkins (Links 72, 101, 102, 110, 130, 160, 161, 162), mule deer winter range from Jackpot to Knoll Creek Area (Links 72, 101, 102, 110, 130) and Toano Draw and Goshute Valley (Links 200, 211, and 212), pronghorn yearlong and summer habitat in the Steptoe Valley (link 250), and pronghorn kidding grounds adjacent to Raiff (Link 291). Sage grouse leks and wintering grounds also occur along many links (72, 100, 110, 160, 161, 162, 1612, 200, 211, 212, 291, and 293). Habitat for long-billed curlew and sandhill crane is encountered in the Steptoe Valley (Links 261, 270, 291, and 293). Ferruginous hawk nests are present in the Egan Range (Link 293) on this route. Route A would follow an existing transmission line where the cumulative effects of raptor predation on sage grouse (Links 72, 101, 102, 110, 130, 160, 161, and 162) would not be expected to increase substantially. Route A and the other alternative routes (Midpoint to Dry Lake) converge just north of Robinson Summit (Link 310).

From the Robinson Summit Substation site south to the Dry Lake Substation site, all the routes would follow the same links. A large number of ferruginous hawk nest sites occur on or near the route northwest of Riepetown (Link 340) and near Coyote Wash (Link 673). Other important raptor habitats include golden eagle nests and bald eagle winter habitat in the vicinity of Gap Mountain (Link 672), burrowing owl nesting (Link 363), and crucial raptor (cliff nesting species) nesting areas in the Horse Range (Links 669, 670) and the vicinity of Gap Mountain (Link 672). Extensive areas of mule deer winter use and migration areas are encountered on this part of the route (Links 670, 672, and 673). Sage grouse leks are traversed by alternatives near the north end of White River Valley (Link 340 and 669).

Route A would traverse Mojave desertscrub vegetation in southern Nevada and would encounter habitat for bighorn sheep, desert tortoise, gambel's quail near Delamar Valley (Link 690), Pahranagat Wash (Link 690), Arrow Canyon Range (Link 670), and sandhill crane habitat (Links 690, 670).

Plants - Route A would cover approximately 314 miles (61 percent) of sage scrub and 108 miles (21 percent) of grassland. Sage scrub, as mapped, represents four identified communities: Great Basin sagebrush on the lower foothills, shadscale at low elevation saline basins, greasewood in saline soils, and samphire/iodine bush. Samphire/iodine bush is a unique plant community found where salt

crystals form on the soil as a result of pooling water. Great Basin sagebrush is the most common and is not highly sensitive. Grassland communities, characterized by cheatgrass brome and crested wheatgrass, are found largely ecotonal with other plant communities. Approximately 8 percent of the land that would be crossed is agricultural, including prime farmlands. The route would cross 26 perennial streams through a small riparian area (less than 1 percent). Less than 1 percent of the route would traverse higher elevation piñon-juniper communities.

From Ely to the Dry Lake Substation site, the route would traverse the northern portion of Delamar Valley (Link 690) through sage scrub, most likely blackbrush and other cooler, Great Basin desertscrub species. Where the route would pass the southern edge of Pahranagat Mountains, there is a distinct transition to Mojave desertscrub, characterized by creosote/bursage with some Joshua trees locally present. The route would cross approximately 56 miles (10 percent) of Mojave Desertscrub.

Four plant species of concern occur along 1.3 miles of the assumed centerline of Route A and four occur within one mile on either side of the assumed centerline. In Idaho, four-wing milk-vetch (*Astragalus tetrapterus*) is found on the assumed centerline east of Browns Bench (Link 70), and populations of two-headed onion (*Allium anceps*) occur on the assumed centerline southwest of Eden (Link 41) and within one mile of assumed centerline (Link 70). Both are Priority 2 in the State. In Nevada, Elko rock-cress (*Arabis falcifructa*), a Category 2 species, occurs within one mile of the route east of the Thousand Springs Valley (Link 162). In the Steptoe Valley less than one mile east of the route, Monte Neva Hot Springs (Link 291) provides habitat for Monte Neva paintbrush (*Castilleja salsuginosa*), a Category 1 species, critically endangered in the Nevada.

Two plant species occur on the route from the Ely area to Dry Lake Substation site. One-leaflet Torrey milk-vetch (*Astragalus calycosus* var. *monophyllidius*), a watch species, is found on the assumed centerline of the route through Jakes Valley (Link 670). Meadow Valley range sandwort (*Arenaria stenomeres*), a watch species, occurs on Link 720. Yellow twotone beard tongue and rosy twotone beard tongue (*Penstemon bicolor*, *P. b. roseus*) and Three-cornered pod Geyer milk-vetch (*Astragalus triquetrus*) are Category 2 candidate species which occur in the vicinity of Links 690, 700, and 720. Only the milk-vetch (*Astragalus*) occurs within the one-mile corridor, although there is a high potential for the two varieties of penstemon to occur given habitat requirements and known ranges.

Route B

Wildlife - From Midpoint Substation to Jackpot, Nevada, Route B is the same as Route A. South of Jackpot, this route would turn southeast through Trout Creek (Links 91, 92, 140, 141, 142, and 144) instead of paralleling the existing transmission lines south where it would encounter sage grouse leks. Route B would encounter more sage grouse leks in Toano Draw (Link 200) and Goshute Valley (Links 221, 226), and again in the Steptoe Valley (Link 259) and Butte Valley (Link 280). Big game habitat on this route includes mule deer crucial winter range along the Toano Range and Goshute Mountains (Link 200, 222), and crucial summer habitat near Trout Creek (Link 91). Important raptor habitats include peregrine falcon winter habitat (Links 222, 224, and 226), bald eagle winter habitat (Links 259, 260), and ferruginous hawk habitat (Links 259, 260) and nest sites within the Butte Valley (Link 280). Habitat for long-billed curlew and sandhill crane would be encountered in Steptoe Valley (Links 259, 260, 270, and 261). An important water use area comprised of Antone Creek and surrounding springs is traversed by this route in Antone Pass (Link 280). The waters are important for wildlife, especially mule deer and sage grouse. From the Robinson Summit Substation site to the Dry Lake Substation site, Route B is the same as Route A.

Plants - Route B would traverse approximately 331 miles (64 percent) of sage scrub and 97 miles (18 percent) of grassland. Other plant communities crossed include agricultural land (8 percent), and less than 1 percent of both piñon-juniper and riparian areas. Twenty-seven perennial streams are crossed. The community types and vegetation described for Route A from the Robinson Summit Substation site to the Dry Lake Substation site also apply to Route B.

The four plant species of concern that occur along 1.3 miles of the route include four-wing milk-vetch (*Astragalus tetrapterus*) east of Browns Bench (Links 64 and 70), two-headed onion (*Allium anceps*) southwest of Eden (Link 41), one-leaflet Torrey milk-vetch (*Astragalus calycosus* var. *monophyllidius*) within the White River Valley (Link 670), and Meadow Valley range sandwort (*Arenaria stenomeres*) within the Coyote Spring Valley (Link 720). These species are identical to those discussed in Route A. One species that occurs in Nevada within the one mile zone adjacent to the Toano Range and Goshute Mountains (Link 222) is Great Basin fishhook (*Sclerocactus pubispinus*). Though it is a Category 3 species, it is protected by the Cactus and Yucca Law in Nevada. Plants along the southern corridors (690, 700, 720) are identical to Route A.

Route C

Wildlife - From Midpoint Substation to north of (Link 200), Route C is the same as Route B. From the crossing of Interstate 80 (Link 211) to Dolly Varden (Link 230), Route C is the same as Route A. Link segment 250 is unique to Route C. Route C would traverse crucial pronghorn winter range in the Currie Hills (Link 250) and would also cross sage grouse leks and bald eagle habitat. From the North Steptoe Substation site to the Dry Lake Substation site, Route C is the same as described for Route A.

Plants - Route C traverses approximately 320 miles (63 percent) of sage scrub and 96 miles (19 percent) of grassland. Approximately 8 percent of the area that would be crossed by this route is agricultural. The remainder is less than 1 percent piñon-juniper and less than 1 percent riparian. Twenty-three perennial streams would be crossed. Refer to Route A for a discussion of the communities and specific description of the Mojave desertscrub found south of the Pahranagat Mountains.

Plant species of concern occur along 1.3 miles of the assumed centerline, as discussed in Route A. Species occurring within the one mile area are *Castilleja salsuginosa* (Link 291) near Monte Neva Hot Springs in Steptoe Valley and *Allium anceps* (Link 41) near Dry Gulch in Idaho. The plants along the southern portion (Links 690, 700, and 720) are identical to those along Route A.

Route D

Wildlife - From Midpoint Substation to just north of HD Summit, Route D is the same as Route A. From HD Summit to approximately Town Creek, Route D would follow an existing transmission line roughly parallel to U.S. Highway 93 (Link 167) and would traverse crucial pronghorn winter range southwest of Wilkins near Bishops Creek (Link 1611), sage grouse leks west of the Windermere Hills (Link 167) and near Interstate 80 east of Wells (Links 180), long-billed curlew habitat southeast of Wells (Links 180, 190), crucial deer winter range in Independence Valley (Link 180, 190), and in the Goshute Valley north of Dolly Varden (Link 230).

From Dolly Varden to the North Steptoe Substation site (Link 241, 243, and 245), Route D would traverse antelope crucial summer range and antelope yearlong habitat. From the North Steptoe Substation site to the Dry Lake Substation site, Route D is the same as Route A.

Plants - Route D would traverse approximately 319 miles (62 percent) of sage scrub and 97 miles (19 percent) of grassland. Approximately 8 percent of the land that would be crossed is agricultural. Other communities consist of less than 1 percent piñon-juniper and less than 1 percent riparian areas. Refer to Route A for a discussion of the communities and specific description of the Mojave desertscrub found south of the Pahranagat Mountains. Plant species of concern occur along 1.3 miles of the assumed centerline, as discussed in Route A. Those within the one mile zone are also the same as those described for Route A (Links 41, 162, 291, and 700).

Route E

Wildlife - From Midpoint Substation to north of Interstate 80 (Link 200), Route E is the same as Route A. From north of Interstate 80 to the North Steptoe Substation site (Links 221, 222, 224, 226, 259, 260, 261, and 270), Route E is same as Route B. From the North Steptoe Substation site to the Dry Lake Substation site, Route E is the same as Route C.

Plants - Route E would traverse approximately 320 miles (61 percent) of sage scrub and 116 miles (22 percent) of grassland. Agricultural lands constitute approximately 9 percent of the land that would be crossed. Piñon-juniper and riparian communities constitute less than 1 percent of the land that would be crossed. The route would cross 22 perennial streams. Refer to Route A for a description of the communities and a description of the Mojave desertscrub found south of the Pahranagat Mountains.

Plant species of concern that occur along 1.3 miles of the route are identical to those discussed for Route A. Monte Neva paintbrush (*Castilleja salsuginosa*) found near Monte Neva Hot Springs in Steptoe Valley (Link 291), and two-headed onion (*Allium anceps*) near Dry Gulch (Link 41) in Idaho occur within the one mile the route. Great Basin fishhook (*Sclerocactus pubispinus*) appears adjacent to the Toano Range and Goshute Mountains (Link 222).

Route F

Wildlife - Route F would traverse west from Midpoint Substation (Links 61, 62). Near Hagerman, the route would traverse habitat for burrowing owl, ferruginous hawk, long-billed curlew nesting populations, and Shoshone sculpin. North and west of Hagerman, the route would traverse sage grouse leks, habitat for pronghorn and river otter at the Snake River (Link 62). Adjacent to the Hagerman Fossil Beds National Monument (Link 64), the route would also traverse several cooperative wildlife tracts that are managed for game birds, such as pheasant. On Link 64, the BLM, Burley District, wildlife biologists discovered two nesting pairs of ferruginous hawks during the late spring of 1992. Where the route would parallel Salmon Falls Creek Canyon, some long-billed curlew and burrowing owl habitat occurs.

From Jackpot, Nevada to north of Interstate 80 in Goshute Valley, Route F is the same as Route B. Then, the remainder of this route to Dry Lake Substation site is the same as described for Route C.

Plants - Route F would traverse approximately 317 miles (60 percent) of sage scrub and 110 miles (20 percent) of grassland. Approximately 11 percent of the land that would be crossed by this route is agricultural. Other plant communities that would be crossed consist of less than 1 percent piñon-juniper and less than one percent riparian. Eight perennial streams would be crossed. Refer to Route A for a description of the plant communities a description of the Mojave desertscrub found south of the Pahranagat Mountains.

Plant species of concern occur along 4.2 miles of the route. In Idaho, mourning milk-vetch (*Astragalus atratus* var. *inseptus*) occurs near Peters Gulch (Link 64), *Lepidium davisii* occurs from near Salmon Creek Falls Creek Reservoir (Link 64), two-headed onion (*Allium anceps*) east of Browns Bench (Link 70), and four-wing milk-vetch (*Astragalus tetrapterus*) adjacent to Salmon Falls Creek (Link 64, 70). In Nevada, one-leaflet Torrey milkvetch (*A. calycosus* var. *monophyllidius*) occurs in Jakes Valley (Link 670) and *Arenaria stenomeres* occurs in Coyote Spring Valley (Link 720). Other species known to exist within the one mile corridor are Torrey's blazing star (*Mentzelia torreyi* var. *acerosa*) northwest of Hagerman (Link 62) and Owyhee mourning milkvetch (*Astragalus atratus* var. *owyheensis*) adjacent to Salmon Falls Creek (Link 64). Three-cornered pod Geyer milk-vetch (*Astragalus triquetrus*), yellow twotone beard tongue and rosy twotone beard tongue (*Penstemon bicolor* var. *bicolor*, and *P. b. roseus*) are as described for Route A along Links 690, 700, and 720.

Route G

Wildlife - From Midpoint Substation to Jackpot, Nevada, Route G is the same as Route A. Route G would cross Salmon Falls Creek through the foothills west of Jackpot (Links 711, 714) and would traverse sage grouse leks and wintering grounds, crucial pronghorn and mule deer winter habitat, and bald eagle nesting and winter habitat.

From Jackpot to the Robinson Summit Substation site, Route G is the same as Route A, except Route G uses Links 713 and 715 near Contact Nevada and Links 150 and 151 near Wilkins. Wildlife habitats the would be traversed are essentially the same as those which occur on Links 72, 101, and 102 as described for Route A. In Thousand Springs Valley (Links 150, 151), the route would traverse two sage grouse leks, skirt the edge of another sage grouse lek buffer, and cross an area of pronghorn winter range. From Dolly Varden to the North Steptoe Substation site (Link 241, 243, and 245), Route G would traverse antelope crucial summer range and antelope yearlong habitat.

From the North Steptoe Substation site to the Robinson Summit Substation site, Route G is the same as Route B. From Robinson Summit Substation to Dry Lake wildlife habitats traversed Route G are the same as those described for these links on Route A.

Plants - Route G would traverse approximately 312 miles (62 percent) of sage scrub and 97 miles (19 percent) of grassland. Other plant communities the would be crossed include approximately 16.8 miles (3 percent) of agricultural land, less than 1 percent piñon-juniper at higher elevations, and less than 1 percent riparian. The route would cross about 78 miles (16 percent) Mojave desertscrub along the southern portion. Plant communities and vegetation types are the same as those described for Route A.

The four plant species of concern that occur along 1.3 miles of the route include four-wing milk-vetch (*Astragalus tetrapterus*) east of Browns Bench (Link 70), two-headed onion (*Allium anceps*) southwest of Eden (Link 41), one-leaflet Torrey milk-vetch (*Astragalus calycosus* var. *monophyllidius*) within the White River Valley (Link 670), and Meadow Valley range sandwort (*Arenaria stenomeres*) within the

Coyote Spring Valley (Link 720). These species are identical to those discussed in Route A. Elko rock-cress, a Category 2 species, occurs within one mile of the corridor in the Thousand Springs Valley (Link 151).

Ely to Delta Segment

Direct Route

Wildlife - The Direct Route would originate from the North Steptoe Substation site, cross the Schell Creek Range and continue past the Red Hills to a point south of the Little Hills (Links 262, 263, 265 and 266). This route would cross near areas of ferruginous hawk, long-billed curlew, bald eagle habitat, sage grouse wintering grounds, and lek and crucial pronghorn winter range. On Link 630, the Direct Route crosses the Confusion Wild Horse Management Area (HMA) between mile posts 3 and 27. From mile posts 8 to 14 the Confusion HMA have been designated crucial wild horse habitat. From mile posts 31 to 39 the line would cross the Swasey HMA, with the segment from mile post 33 to 34 crossing crucial habitat within that HMA.

Where this route would traverse the Snake Valley (Link 630), sensitive aquatic/wetland habitats are encountered. One of these, the Leland-Harris Spring Complex, is inhabited by least chub, desert dace, and spotted frog. Wetland areas associated with this spring complex are also habitat for the Great Basin silver spot butterfly. Crucial deer winter habitat would be traversed by this route in the House Range (Link 630). Crucial mule deer winter habitat and a migration corridor would also be encountered in the Drum Mountains (Links 630, 650). The route would traverse pronghorn habitat north of Sugarville (Link 582) at the Intermountain Substation site.

Plants - The Direct Route would traverse a mosaic of sage scrub for approximately 83 miles (64 percent) and grassland communities for 27 miles (20 percent). The route would cross approximately 21 miles (16 percent) of playa in Utah. No sensitive plant species are known to occur within one mile of the route.

Cutoff Route

The Cutoff Route is the same as the Direct Route from the North Steptoe Substation site to just south of the Little Hills. The route would then continue southwest across the Snake Valley (Link 266).

Wildlife - A number of raptor nesting areas would be traversed by this route including golden eagle nest sites within the Snake Valley (Link 268) and Tule Valley (Link 462). Ferruginous hawk nests also occur in the Tule Valley (Link 462). Crucial Mule deer winter range and migration corridors occur in the Confusion Range and Middle Range (Link 462) and a mule deer migration corridor is traversed in the Congor Range (Link 268). Other important wildlife habitats include critical pronghorn habitat and crucial water use areas in the Snake Valley (Link 268). The route would traverse pronghorn habitat west of Smelter Hills (Links 571) and north of Sugarville (Link 582) at the Intermountain Substation site. The Cutoff Route is also likely to affect populations of wild horses. Between miles 11 and 19 on Link 268, the route crosses the Conger Mountain HMA.

Plants - The Cutoff Route would traverse a mosaic of sage scrub for approximately 101 miles (66 percent) and grassland communities for 34 miles (22 percent). The route would cross approximately 18 miles (12 percent) of playa in Utah. One population of Great Basin fishhook (*Sclerocactus*

pubispinus) occurs along the assumed centerline of Link 462. The species is also known to occur on Link 268.

230kV Corridor Route

Wildlife - The 230kV Corridor Route would originate form the Robinson Summit Substation site and parallel two 230kV transmission lines east toward Ely, Nevada (Link 350). The route would traverse sage grouse leks and wintering grounds northwest of Ely (Links 350, 351, and 352) and in the Schell Creek Range (Link 380). Ferruginous hawk nests and long-billed curlew habitat occur on in the Steptoe Valley (Link 351, 352, and 370). From east of the Nevada-Utah state line (Link 460), this route is the same as described for the Cutoff Route. Links 461 and 462 traverse wild horse habitat in the Conger Mountain HMA. Specifically, miles 6 to 13 on Link 461 and miles 1 to 13 on Link 462 involve the Conger Mountain HMA.

Plants - The 230kV Corridor Route would traverse a mosaic of sage scrub for 104 miles (65 percent) and grassland communities for 37 miles (23 percent). In Utah, the route would cross approximately 14 miles (9 percent) of playa. One population of Great Basin fishhook (*Sclerocactus pubispinus*) occurs along the assumed centerline of Link 462.

Southern Route

Wildlife - The southern route exits the Robinson Summit Substation site from the south and follows the west side of the Egan Range. Ferruginous hawk nest sites are encountered along Link 340 northwest of Riepetown and at the north end of the Fortification Range on Link 420. Sage grouse leks occur at the north end of White River Valley (Link 364) and in Spring Valley (Link 420). Long-billed curlew habitat is encountered where Link 420 traverses Steptoe Valley. Antelope kidding grounds occur north of the Fortification Range (Link 420). Key deer winter ranges occur by Big Springs Wash north of GBNP (Link 430) and in the Antelope Valley near Utah State Highway 21 (Link 451). Link 451, between mileposts 11 and 17 cross the Burbank HMA and miles 24 to 34 involve the King Top HMA. Other important habitats include a crucial water use area (Link 364) and critical pronghorn habitat near the Nevada-Utah state line (Link 450). From here Link 571 through 582 are the same for both the 230kV Corridor Route and the Southern Route.

Plants - The Southern Route would traverse predominately sage scrub for approximately 154 miles (73 percent) with grassland intermingled for 27 miles (13 percent). Twenty-two miles (11 percent) of the route would cross areas of playa.

Five species that are known to occur along the route are:

- Great Basin fishhook (*Sclerocactus pubispinus*) along the southern end of the Snake Range (Link 430, 451)
- compact catseye (*Cryptantha compacta*), sand-loving buckwheat (*Eriogonum ammophilum*), and low beard tongue (*Penstemon nanus*) at the southern tip of the Tule Valley (Link 451)
- currant milkvetch (*Astragalus uncialis*) located in the Swasey Wash (Link 490)

Populations of species that occur within the one mile corridor include Great Basin fishhook, currant milk-vetch, Jones globemallow (*Sphaeralcea caespitosa*), limestone buckwheat (*Eriogonum eremicum*), Calloway milk-vetch (*A. callithrix*), and terrace buckwheat (*E. natum*).

Environmental Consequences

Introduction

The vegetation types, sensitive wildlife, and plant species inventoried are described in detail in the technical report (refer to Appendix H of the DEIS/DPA for the locations where technical reports can be reviewed). Impact matrices were developed to identify the initial impacts anticipated as a result of the SWIP, to recommend mitigation measures to minimize those impacts, and to determine residual impacts.

Issues for wildlife species and important wildlife habitats are related primarily to increased public access into remote areas and/or ground disturbance. Ground disturbance caused by construction of the transmission line could result in habitat destruction and degradation, and future erosion problems where stabilizing plants are lost. Increased public access into remote areas, during and following construction, may result in increased human harassment of all classes of wildlife, increased levels of poaching, and increased take of certain species by legal hunters, trappers, or fishermen. Increased public access can also result in habitat damage from ORV vehicle use, accidentally set fires, and direct mortality of individual animals resulting from increased or higher speed vehicular traffic.

The GIS impact assessment models and matrices are described in the technical reports. In the technical report are narrative descriptions and data tables for each of the alternative route segments studied. The technical reports are available for review at the agency offices listed in Appendix H of the DEIS/DPA.

Methods

Impact types considered in the impact analysis models were:

1) Threatened, Endangered, Rare or Unique Species:

   - affect any federally classified threatened or endangered species or critical habitat thereof
   - affect any state listed protected, threatened, unique or otherwise sensitive species or habitat thereof

2) General Wildlife:
   - create a barrier or hazard to the migration or movement of any wildlife species (see discussion below on potential hazard to migrating raptors and other larger bird species).
   - alter the diversity of any biotic community or populations of any animal species communities, or areas

3) Increase human activity/public access.

To determine the intensity (level) of impacts that would result from the construction and operation of the SWIP, two models were developed to identify direct and indirect impacts. The access requirements were determined in a model that was compared with sensitive wildlife resources and habitats.

Where access and other ground disturbance would be greater and sensitive biological resources were found (e.g., wildlife habitats, sensitive plants, etc.), initial impacts would be of a higher intensity. These adverse impacts would be long-term unless revegetation would be done.

Where access roads would have to be constructed into currently remote areas, indirect long-term impacts would likely result. These impacts would be from increased pressure on biological resources from potentially greater presence of humans (e.g., legal hunting, poaching, fishing, ORV access, etc.). Refer to cumulative effects for a discussion of some of these indirect impacts that would occur over time.

Adverse, indirect, and long-term impacts would also result simply from the presence of the transmission lines. For example, because golden eagles will use transmission towers for hunting perches, predation on sage grouse within their sensitive habitats (i.e., leks and wintering grounds) may increase. A similar predation issue is found for juvenile desert tortoise where ravens have transmission towers as hunting perches. These impacts were documented where these impact types could be identified and where sensitive habitats corresponded to the potential presence of one of the alternative routes.

Mitigation Planning

In order to reduce potential impacts resulting from ground disturbance and increased levels of public access along the various alternative routes of the SWIP, generic and selectively recommended mitigation measures were applied to initial impact levels.

Generic mitigation as part of the project description, is applied uniformly along the route and tends to reduce impact potential to many resources (refer to Table 1-6). For example, restricting vehicle construction equipment movement to predesignated routes (#1) and recontouring and revegetating disturbed areas where necessary (#3 and #4), and construction of roads at right angles to streams (#13).

Selectively recommended mitigation measures are more specific and are applied to mitigate specific initial impacts (refer to Table 1-5). These measures include overland access to minimize ground disturbance (#2), placement of towers to avoid sensitive features (#6), modified tower design to minimize avian conflicts (#7), use of helicopter construction under certain conditions (#12), and limiting construction activities during sensitive periods (#11).

Results

Midpoint to Dry Lake Segment

Route A

Wildlife - From the Midpoint Substation to Jackpot, Nevada (Links 10, 20, 40, 41, 50, 70), initial impact levels (before applying of mitigation) resulting from construction of the project would be generally low and moderate. Mitigation (discussed at the beginning of this section) would reduce these impacts to low. The only high residual impacts on this route in Idaho would be where sage grouse leks are located near the Nevada state line (Link 70).

Federal and state biologists are concerned that the SWIP would add yet another cumulative impact on sage grouse populations in southern Idaho and eastern Nevada (refer to cumulative effects section at the end of Chapter 4 of the DEIS/DPA and the expanded discussion in Chapter 3 of the document). Concern has focused on the increase in public access within sage grouse habitats, placement of towers and access roads in strutting or crucial wintering grounds, and the fact that predators of sage grouse (i.e., golden eagles) use the transmission towers as hunting perches. Adult and immature birds and nests are all thought to be vulnerable. Because there is no way to mitigate predation of sage grouse in these areas, these impacts would remain high even after mitigation and would be long term and significant. Eliminating access would be difficult, there would be some potential for disturbance and poaching in addition to the loss of habitat and disturbance due to construction activities.

There is potential for impact to wild horses along Route A. Horses occur along the route and some disturbance to these animals is expected, especially during construction. Horses are extremely mobile and readily move large distances on open public lands. Consequently, long-term adverse impacts to horse populations are not anticipated.

There would be high initial impacts to long-billed curlew nesting habitat where the project would significantly increase potential public access (Links 10, 20, 40, 70) due to the difficulty of eliminating access in areas of flat or gentle terrain and the vulnerability of nesting curlews. These impacts would be adverse and long-term. However, mitigation measures (discussed at the beginning of this section) would reduce most of these impacts to insignificant levels.

From Jackpot to northwest of the Windermere Hills (Links 72, 101, 102, 110, 130, 160, 161, 162) in northern Nevada, Route A would cause mainly moderate to high initial impacts. These initial impact would be due primarily to crucial mule deer and pronghorn habitats, bald eagle wintering and potential nesting habitat (Link 72), and sage grouse leks and wintering habitat (Links 160, 161, 162). The impacts to sage grouse are largely unmitigable because of potential predation by golden eagles on adult and immature birds (see discussion above). There would be 0.2 mile of high residual impacts to sage grouse (Link 160). These impacts would be significant, adverse, and long-term. However, applying mitigation measures along this portion of Route A would reduce all other high impacts to insignificant levels.

Moderate residual impacts would occur in some areas along this segment of Route A where public access would be significantly increased in big game habitats and in ferruginous hawk habitats. These impacts would be adverse and long-term, but are not considered significant. Because it is difficult to completely restrict new access where roads and trails have been constructed, there can be increased pressure on these species by hunting/poaching and harassment.

From the Windermere Hills to north of Interstate 80 near Oasis, Nevada (Links 1612, 152, 200), Route A would traverse the northern toe of the Windermere Hills and then southeast to East Squaw Creek. High initial impacts along this portion of the route would be primarily caused by increased public access in pronghorn winter range for 0.5 miles (Link 1612). These high impacts would be reduced to moderate, insignificant levels following mitigation (discussed at the beginning of this section). An additional 1.8 miles of high initial impacts would result to sage grouse winter range and leks north of East Squaw Creek (Link 200). Similar to the impacts to sage grouse described above, these impacts would remain high following mitigation.

In the section of the Route A between north of Interstate 80 and Dolly Varden in the Goshute Valley (Links 211, 212), high initial impacts would be expected to result from increased public access. Potentially high initial impacts from ground disturbance to sage grouse leks would occur on Link 211 at the north end of Goshute Valley (between mileposts 14.7 and 16.3). Following mitigation, these impacts to sage grouse leks would be expected to remain adverse and significant for about 1.6 miles.

From the Dolly Varden in the southern end of Goshute Valley to the North Steptoe Substation site (Links 211, 230, 250, 259, 260), high initial impacts from ground disturbance would occur for 0.2 miles because of sage grouse leks and known occurrences of wintering bald eagles near the north end of Steptoe Valley (Link 259). Despite applying mitigation measures, 0.2 miles of high residual impacts (adverse and significant) would remain.

From the North Steptoe Substation site to the Robinson Summit Substation site (Links 270, 291, 293, 310), increased public access would cause high initial impacts to sage grouse leks, long-billed curlew, and sandhill crane from increased public access near Monte Neva Hot Springs at the base of the Egan Range (milepost 11.8 to 11.9). No high residual impacts would be expected following mitigation. Ground disturbance along this segment of the route would result in high initial impacts along the base of the Egan Range (Link 291) in the Steptoe Valley (mileposts 4.4 to 6.1 and 7.9 to 11.8) and (Link 293) in the Egan Range (mileposts 1.9 to 4.4 and 4.8 to 6.5). Following mitigation (discussed at the beginning of this section), high residual impacts would occur for 3.0 miles in the Steptoe Valley (Link 291) and for 4.5 miles in Dry Canyon (Link 293). High residual impacts (significant impacts) on both links would result from the presence of sage grouse leks (refer to previous discussion of sage grouse effects).

Route A from the Robinson Summit Substation site to the Dry Lake Substation site (Links 340, 362, 363, 669, 670, 672, 673, 675, 690, 700), would cross through Great Basin desertscrub habitats along the north portion of this segment and Mojave desertscrub habitats in the southern portion. Generally, initial impacts for most of the route would be moderate to high. High initial impacts would be most notable where habitat of the desert tortoise is encountered in Coyote Spring Valley (Links 690, 700). Adding a transmission facility would reduce the amount of suitable tortoise habitat because of roads needed to construct and maintain the line, and would increase the potential for human activity.

Links 690, 700, and 720 of the SWIP route traverse 53.2 miles of desert tortoise habitat. Link 690 enters desert tortoise habitat in the extreme southern portion of the Pahranagat Valley. The first 4.3 miles of habitat are in an area designated as Category III. This area is at the northern limit of species distribution and tortoise densities are very low (0 to 10 tortoises per square mile). The last 15.3 miles of Link 690 are in Category I habitat. Tortoise densities in this area (northern most extension of Coyote Spring Valley) range from low to very high (140+ per square mile).

Links 700 and 720 continue south along U.S. Highway 93 through Coyote Spring Valley, and traverse 30.2 miles of Category I habitat. Fourteen miles is located on private land owned by Aerojet

Corporation and is, therefore, not officially categorized by the BLM. However, for the purposes of this Biological Assessment, it was considered to be Category I habitat as requested by the BLM. Surveys in this area indicate relatively high densities of tortoises (45 to 140+ tortoises per square mile) in portions of the Coyote Spring Valley. The habitat is generally considered to be in good condition. As the SWIP enters the Dry Lake Valley (Link 720), it traverses 3.2 miles of Category III habitat. The dry lake bed itself is not tortoise habitat. Tortoise densities in this portion of the Dry Lake Valley are in the very low to low range (0 to 45 tortoises per square mile).

In general, all new alignments in desert tortoise habitat are in close proximity to the existing roadway and tortoise density may be lower than in adjacent habitat. Typically tortoise numbers are greatly reduced near paved roadways. Therefore, densities within the proposed corridor maybe lower than estimates for outlying areas.

The Coyote Spring Valley has been proposed as a Tortoise Management Area in the Short-term Habitat Conservation Plan for Clark County (Regional Environmental Consultants, 1990). Further, the FWS's Desert Tortoise Recovery Plan is likely to designate the Valley as a protected management area.

Impacts to desert tortoise from increased human activity include being crushed by vehicles, shooting, illegal collecting, and destruction of burrows. Adverse, indirect, and long-term impacts could result simply from the presence of the transmission lines because ravens may use the transmission towers for hunting perches, and predation on juvenile desert tortoise may increase. Predation by ravens is usually a problem near urban areas, water bodies, and solid waste disposal sites, where ravens are typically found. Although raven predation is not considered a significant problem at this time, federal biologists are concerned that the problem may become more significant if Las Vegas and surrounding areas continue to develop and expand.

Mitigation measures applied during construction would effectively mitigate direct impacts to desert tortoise (e.g., tortoise or tortoise burrows being crushed by vehicles, etc.). However, it is unclear how raven predation, if it becomes a significant problem in the future, can be effectively mitigated.

A Biological Assessment has been prepared for desert tortoise, and formal consultation was completed with the FWS under Section 7 of the Endangered Species Act (1974). The BLM requires that an opinion be rendered by the FWS on the desert tortoise prior to a Record of Decision on the SWIP. The Biological Opinion, released on May 12, 1993, was favorable to allow construction of the SWIP and the detailed mitigation contained in the opinion will become part of the stipulations required to construct and operate the SWIP. One of the major mitigation measures would be to favor constructing the project through the sensitive area during the winter months when the tortoise are inactive (refer to #11 in Table 1-5). The Stateline Resource Area has released its Draft Resource Management Plan (RMP) for public review. The area of Coyote Springs Valley was proposed in several alternatives as an Area of Critical Environmental Concern for desert tortoise. The BLM's RMP process is being prepared in coordination with the Short-term Habitat Conservation Plan for desert tortoise that was prepared by Clark County (1991). Refer to the Technical Report for a description of the habitat classification for desert tortoise (e.g. category I, II, and III). Also refer to Appendix C - Biological Opinion.

The burrowing owl is a species of concern to the NDOW. Burrowing owls occur in Mojave desertscrub habitat and, therefore, could occur on Links 690, 700, and 720. Burrowing owls often use desert tortoise burrows and could be found throughout all tortoise habitat along the project. Limiting construction to winter months to reduce conflicts with owls has been recommended by the BLM.

Other highly sensitive features include ferruginous hawk nest sites (Link 673, 340), crucial raptor nesting areas (Links 669, 672), sage grouse leks (Link 669), crucial mule deer winter range and migration corridors (Links 672, 669, 670, 363, 673), and desert bighorn sheep movement/migration corridors (Links 690, 700). There are two bighorn sheep water developments in the southern end of the Arrow Canyon Range and up to two more may be constructed before construction of the project. The BLM has recommended that construction occur in the winter months and no new access roads be constructed within 2 miles of water sources.

High initial impacts from potentially increased public access along this section of the Route A would result from the higher potential for human interaction with mule deer, desert bighorn sheep, and ferruginous hawks. Specifically, there would be potential high initial impacts to mule deer migration corridors and ferruginous hawk habitat along Sierra Valley into Jake's Wash (Link 363 between mileposts 10.6 and 11.1). There would also be potential high impacts to a mule deer migration between mileposts 11.3 and 11.7 on Link 363 at the southern end of Sierra Valley. Along the foothills at the western edge of White River Valley (Link 669) the route would cause high initial impacts for 6.5 miles in a mule deer migration corridor. There would be 0.3 miles of high initial impacts to key deer winter range at the southern limit of the Egan Range in the White River Valley (Link 672). These impacts would be mitigated to insignificant levels (mitigation discussed at the beginning of this section).

Where Route A would cross the northeast end of Dry Lake Valley (Link 673), there would be 1.7 miles of high initial impacts to ferruginous hawk nest sites and 0.7 miles of similar impacts to key deer winter range. There would be 2.3 miles of potentially high initial impacts relating to increased public access and desert tortoise habitat and bighorn sheep movement corridors along the southern end of Delamar Valley and into Pahranagat Wash (Link 690). These impacts would be mitigated to insignificant levels (mitigation discussed at the beginning of this section).

Along Route A in Sierra Valley and into Jakes Wash (Link 363) there would be 1.0 mile of high initial impacts (from ground disturbing activities) to ferruginous hawk habitat and nesting areas of other raptor species. There would be 12.7 miles of high initial impact from ground disturbance to mule deer migration corridors and staging areas and raptor nesting areas along the foothills at the western edge of White River Valley (Link 669). Where this route would cross the northeast end of Dry Lake Valley (Link 673), there would be 1.7 miles of high initial impact to nesting ferruginous hawks.

Mitigation measures (discussed at the beginning of this section) are expected to be effective in reducing high initial impacts on the Robinson Summit to Dry Lake section of the Route A to insignificant levels.

Moderate residual impacts would occur in some areas along this segment of Route A where public access would be significantly increased in big game habitats and in ferruginous hawk habitats. These impacts would be adverse and long-term, but are not considered significant. Because it is difficult to completely restrict new access where roads and trails have been constructed, there can be increased pressure on these species by hunting/poaching and harassment.

Moderate residual impacts to desert tortoise would likely result in some areas where public access is increased significantly.

Vegetation/Sensitive Plant Species - No federally listed endangered or threatened plant species is known to occur. However, this does not mean that none exist, as surveys have not been conducted over much of the area.

Ground disturbance along Route A would result in moderate to high initial impacts where two sensitive plant species, four-wing milk-vetch (*Astragalus tetrapterus*) and two-headed onion (*Astragalus anceps*), occur for 1.3 miles along the assumed centerline east of Salmon Falls Creek Reservoir (Link 70). Additional moderate to high initial impacts would be expected where One-leaflet torrey milk-vetch (*A. calycosus* var. *monophyllidius*) occurs in White River Valley (Link 670) and where Meadow Valley range sandwort (*Arenaria stenomeres*) occurs in Coyote Spring Valley and Arrow Canyon (Link 720). Potential increases in public access would not be considered a serious threat. Following mitigation, residual impacts would be expected to be low. Revegetation of disturbed areas in dry climates is difficult. Rehabilitation and revegetation would be addressed specifically in the Construction, Operation, and Maintenance COM Plan.

One C2 species and one C1 species occur within the one mile of the assumed centerline. monte neva paintbrush (*Castilleja salsuginosa*) (C1), also listed as critically endangered on the state list, occurs near Monte Neva Hot Springs in Steptoe Valley (Link 291). Increased public access to the Springs could result in trampling and destruction of habitat. Elko rock-cress (*Arabis falcifructa*), a C2 species, occurs along the western edge of Thousand Springs Valley (Link 162). Yellow twotoned beard tongue and rosy twotoned beard tongue (*Penstemon bicolor, P. b. roseus*) and three cornered pod Geyer milk-vetch (*Astragalus triquetrus*) (the only one with known locations within the one-mile corridor) are Category 2 candidate species which could occur on Links 790, 800, 830 and 840. These plant species would most likely not be impacted by construction, if overland access to tower sites along the assumed centerline were predesignated. Pre-construction surveys may not be adequate, as these species will only germinate during years when climatic conditions are favorable. Mitigation measures, such as removing and saving topsoil which may contain the seed base, would be addressed in the COM Plan.

Route B

Wildlife - From Midpoint Substation to Jackpot, Nevada, the initial and residual impacts expected for Route B would be the same as those described for Route A.

From Jackpot to north of Interstate 80 near Oasis, Nevada (Links 91, 92, 140, 141, 142, 144), there would be high initial impacts for 3.3 miles to sage grouse leks and crucial mule deer summer habitat along Trout Creek (Link 92) and 0.3 mile to sage grouse winter grounds in the Trout Creek area (Link 91) that would result from increased public access and ground disturbance. There would be high initial impacts to a sage grouse lek and 1.5 miles high initial impacts to sage grouse winter range in Toano Draw (Link 142). Near the headwaters of Trout Creek (Link 92), there would be 2.2 miles of initial high impacts associated with sage grouse leks. Another 4.4 miles of high initial impacts associated with sage grouse leks and sage grouse winter range would occur in Toano Draw (Link 142). Following mitigation (defined at the beginning of this section), there would remain 0.3 miles of high residual impacts to sage grouse winter range in Trout Creek (Link 91), 1.5 miles to sage grouse leks at the headwaters of Trout Creek (Link 92), and 4.4 miles to sage grouse leks and sage grouse winter grounds in Toano Draw (Link 142).

Federal and state biologists are concerned that the SWIP would add yet another cumulative impact on sage grouse populations in southern Idaho and eastern Nevada (refer to cumulative effects section at the end of Chapter 4). Concern has focused on the increase in public access within sage grouse

habitats, placement of towers and access roads in strutting or crucial wintering grounds, and the fact that predators of sage grouse (i.e., golden eagles) use the transmission towers as hunting perches. Adult and immature birds and nests are all thought to be vulnerable. Because there is no way to mitigate predation of sage grouse in these areas, these impacts would remain high even after mitigation and would be long term and significant. Eliminating access would be difficult. There would be some potential for disturbance and poaching in addition to the loss of habitat and disturbance due to construction activities.

Ground disturbance would result in 0.3 mile of high initial impacts to key deer winter range, and pronghorn winter range in the Trout Creek area (Link 91). Near the headwaters of Trout Creek (Link 92), there would be 2.2 miles of initial high impacts associated with critical deer summer range. Mitigation measures (discussed at the beginning of this section) would be expected to effectively reduce high impacts to insignificant levels along this segment of Route B, except for long-term impacts of raptor predation on sage grouse.

Generally, impacts along the segment of Route B, from the north of Interstate 80 to the North Steptoe Substation site (Links 221, 222, 224, 226, 259, 260), would be low, with some moderate impacts. Moderate initial impacts along this segment of the route would be associated with occurrences of peregrine falcon and sage grouse. High initial impact to sage grouse leks would occur along this segment of Route B in the Goshute Valley (Links 221) and to sage grouse leks and bald eagle habitat in Antelope Valley (Link 226). Mitigation measures (discussed at the beginning of this section) would be expected to effectively reduce high impacts to insignificant levels along this segment of Route B, except for long-term impacts of raptor predation on sage grouse.

From the North Steptoe Substation site to the Robinson Summit Substation site, initial impacts for Route B would be generally low to moderate where Route B would cross through Antone Pass at the north end of the Egan Range into Butte Valley (Link 280). High initial impacts along this section of the route would occur where increased public access would be significant in important water use areas (milepost 5.7 to 6.1) and in an area that is used by bald eagle, ferruginous hawk, and sage grouse (milepost 11.8 to 11.9). Potential impacts from ground disturbance along this section of Route B would range from low to high, with a fairly extensive potential for high initial impacts in areas where sage grouse leks and long-billed curlew and sandhill crane occur. Key water use areas are also identified as locations where high impacts could occur, as are areas of sage grouse wintering grounds. High initial impacts would occur for 14.2 miles where this route crosses through at the north end of the Egan Range into Butte Valley (Link 280). Mitigation (discussed at the beginning of this section) would be expected to reduce the impacts from increased public access along this segment of Route B to insignificant levels. A total of 11.1 miles of high residual impact would be expected to persist from the construction and operation of the transmission line in the vicinity of Antone Pass (Link 280). Most of these high residual impacts would be associated with sage grouse leks (refer to discussion above regarding raptor predation).

Construction of the SWIP on Route B would likely affect wild horse populations along the route. The Butte HMA is partly located within the route. Given the mobility of this species, however, impacts are expected to short-term and little significance.

From the Robinson Summit Substation site to the Dry Lake Substation site, the potential impacts of Route B would be the same as those described for Route A.

Vegetation/Sensitive Plant Species - Generally, the plant species described along the assumed centerline of Route A would be the same as those for Route B. One species of cactus, Great Basin

fishhook (*Sclerocactus pubispinus*), occurs within one mile of the assumed centerline of the section of this route along the eastern foothills of the Toano Range and Goshute Mountains (Link 222). It is often collected for horticultural purposes and may be impacted by increased public access. Suitable habitat for this species extends to areas on the assumed centerline where ground disturbance could directly impact habitat and populations. This plant species is protected by the Cactus and Yucca Law in Nevada, which requires that permits be obtained from the Division of Forestry for removal of any plants.

Route C

Wildlife - From Midpoint Substation to Jackpot, Nevada (Links 10, 20, 40, 41, 50, 70), potential impacts to wildlife for Route C would be the same as described for Route A. From Jackpot to the southern end of Toano Draw north of Interstate 80 (Links 91, 92, 140, 141, 142, 144, 200), potential impacts to wildlife for Route C would be the same as described for Route B.

Then, from north of Interstate 80 in Toano Draw to the Dry Lake Substation site, potential impacts to wildlife for Route C would be the same as described for Route A.

Vegetation/Sensitive Plant Species - Potential impacts to sensitive plants for Route C would be the same as discussed for Route A, except for impacts described for Elko rock-cress (*Arabis falcifructa*) (Link 162).

Route D

Wildlife - From Midpoint Substation to Jackpot, Nevada (Links 10, 20, 40, 41, 50, 70), potential impacts to wildlife for Route D would be the same as described for Route A. Potential impacts to wildlife for Route D, from Jackpot to northwest of the Windermere Hills (Links 72, 101, 102, 110, 130, 160, 161, 162), would also be the same as described for Route A.

From the Windermere Hills to Dolly Varden in Goshute Valley (Links 1611, 166, 167, 1613, 180, 190, 230), initial impacts to wildlife resources for Route D from potentially increased public access and ground disturbance would be generally low or indiscernible. Some potential high initial impacts would occur in pronghorn winter range west of HD Summit in the Bishops Creek area (Link 1611). Because of the relatively good access along this segment of this route, other impacts from increased public access would be low or indiscernible. In addition, some other high initial impacts would occur further south in Bishops Creek (Link 167). There would also be some moderate to high initial impacts to sage grouse leks and pronghorn winter range in this area (Link 166). Potential high initial impacts to sage grouse leks and long-billed curlew habitat would also occur along the western toe of the Wood Hills (Link 180). Where this segment of Route D would cross Independence Valley to the Pequop Mountains (Link 190), there would be some moderate initial impacts to long-billed curlew, sandhill crane, and key deer winter habitat.

Mitigation (discussed at the beginning of this section) would be expected to reduce potential high initial impacts from increased public access to moderate or low residual impacts. Potential high impacts to sage grouse leks would be expected to remain high following mitigation in Clover Valley (between mileposts 17.6 and 18.7) along the western toe of the Wood Hills (Link 180). Other residual impacts for this segment of the route would be expected to be moderate to low.

Federal and state biologists are concerned that the SWIP would add yet another cumulative impact on sage grouse populations in southern Idaho and eastern Nevada (refer to cumulative effects section at the end of Chapter 4). Concern has focused on the increase in public access within sage grouse habitats, placement of towers and access roads in strutting or crucial wintering grounds, and the fact that predators of sage grouse (i.e., golden eagles) use the transmission towers as hunting perches. Adult and immature birds and nests are all thought to be vulnerable. Because there is no way to mitigate predation of sage grouse in these areas, these impacts would remain high even after mitigation and would be long term and significant. Eliminating access would be difficult. There would be some potential for disturbance and poaching in addition to the loss of habitat and disturbance due to construction activities.

From the Dolly Varden area to the North Steptoe Substation site, Route D would result in some moderate and high initial impacts at the north end of the Steptoe Valley near Currie, Nevada (Link 241). These impacts would be associated with significant access increases in important pronghorn antelope habitat, long-billed curlew and sandhill crane habitat, Bonneville cutthroat trout habitat, and sage grouse leks. Other potential impacts in the Steptoe Valley would be expected to be moderate to low, with some high impacts. There would be high initial impacts to sage grouse leks, critical pronghorn habitat, and habitat of sandhill crane and long-billed curlew for 11.5 miles in the northern portion of Steptoe Valley (Link 241) and for 0.1 miles where the route would cross Steptoe Valley (Link 243).

Following mitigation (discussed at the beginning of this section), potential high initial impact levels from increased public access and ground disturbing activities along this segment of Route D would be reduced to moderate or low residual (insignificant) impacts. Approximately 1 mile of high residual impacts would be expected to sage grouse leks that occur (mileposts 28.3 to 29.4) in the northern portion of Steptoe Valley (Link 241) (refer to discussion above for long-term predation impacts to sage grouse).

From the North Steptoe Substation site to the Dry Lake Substation site, potential impacts to wildlife for Route D would be the same as described for Route A.

Vegetation/Sensitive Plant Species - The potential for impacts to occurrences of unique plant communities and/or sensitive plants on Route D would be the same as that described for Route A.

Route E

Wildlife - From Midpoint Substation to Jackpot, Nevada, potential impacts to wildlife for Route E would be the same as described for Route A. From Jackpot to northwest of the Windermere Hills (Links 72, 101, 102, 110, 130, 160, 161, 162), potential impacts to wildlife for Route E would be the same as described for Route A. Then, from the northwest of the Windermere Hills to north of Interstate 80 near Oasis, Nevada (Links 1612, 152, 200), potential impacts to wildlife for Route E would also be the same as described for Route A.

Continuing from the north of Interstate 80 near Oasis, Nevada to the North Steptoe Substation site (Links 221, 222, 224, 226, 259, 261), potential impacts to wildlife for Route E would be the same as described for Route B.

From the North Steptoe Substation site to the Robinson Summit Substation site (Links 270, 291, 293, 310), potential impacts to wildlife for Route E would again be the same as described for Route A.

Then, from the Robinson Summit Substation site to the Dry Lake Substation site, potential impacts to wildlife for Route E would also be the same as described for Route A.

Vegetation/Sensitive Plant Species - The potential for impacts to occurrences of unique plant communities and/or sensitive plants on Route E, from Midpoint Substation to north of Interstate 80, would be the same as those described to Route A. From north of Interstate 80 to the North Steptoe Substation site, the potential for impacts to occurrences of unique plant communities and/or sensitive plants for Route E would be the as same as that described for Route B. Then, from the North Steptoe Substation site to the Dry Lake Substation site, Route E would again be the same as described for Route A.

Route F

Wildlife - From Midpoint Substation to Jackpot, Nevada (Links 61, 62, 64, 70), 1.3 miles of high initial impacts occur to pronghorn habitat and long-billed curlew nesting areas from where Route F would traverse areas of open range east of Hagerman, Idaho (Link 61). In addition, considerable moderate initial impacts associated with pronghorn habitat and sage grouse leks would result in plateau areas along Salmon Falls Creek Canyon (Link 64). Ground disturbing activities and increased public access in the area east of Hagerman (Link 61) would result in mostly moderate initial impacts. In the plateau areas along Salmon Falls Creek Canyon (Link 64) initial impacts would vary from low to moderate. Wildlife species that would be affected include pronghorn, burrowing owl, long-billed curlew, pheasant, and sage grouse leks.

Following mitigation (discussed at the beginning of this section), no high residual impacts would be expected to remain along this segment of the Route F.

From Jackpot to the north of Interstate 80 near Oasis, Nevada (Links 72, 91, 92, 140, 141, 142, 144), potential impacts to wildlife for Route F would be the same as described for Route B. Then, from north of Interstate 80 near Oasis, Nevada to the Dry Lake Substation site, potential impacts to wildlife for Route F would be the same as described for Route A.

Vegetation/Sensitive Plant Species - From Midpoint Substation to Jackpot, Nevada (Links 61, 62, 64, 70), six sensitive plant species would be directly impacted by ground disturbance where they would occur along 4.2 miles of the assumed centerline on plateau areas above the Snake River (Links 61, 62) and along Salmon Falls Creek Canyon (Links 64, 70).

Two of the species that would be affected by the route are federal candidate species (C2). mourning milk-vetch (*Astragalus atratus* var. *inseptus*) (also a BLM sensitive species) occurs along the route near Peters Gulch (Link 70) and Davis' peppergrass (*Lepidium davisii*) on the plateau above Salmon Falls Creek Canyon (Link 64). Populations of four-wing milk-vetch (*A. tetrapterus*) also occur over a two square mile area along Salmon Falls Creek (Link 64) and two-headed onion (*Allium anceps*) occurs in the foothills west of Jackpot (Link 70). Both are Priority 2 species in the State of Idaho. One candidate species, Monta Neva paintbrush (*Castilleja salsuginosa*), and two watch species in Nevada, One-leaflet Torrey milk-vetch (*Astragalus calycosus* var. *monophyllidius*) and Meadow Valley range sandwort (*Arenaria stenomeres*), occur within a one mile area and may experience indirect impacts (refer to discussion under Route A).

From Jackpot, Nevada, to the Dry Lake Substation site, the potential for impacts to occurrences of unique plant communities and/or sensitive plants for Route F would be the same as that described for Route A.

Route G

Wildlife - From Midpoint Substation to Jackpot, Nevada, potential impacts to wildlife for Route E would be the same as described for Route A.

From Jackpot to northwest of the Windermere Hills, moderate to high initial impacts would be expected to occur where Route G would traverse crucial mule deer and pronghorn winter habitat, bald eagle potential nesting and wintering habitat and sage grouse leks and wintering grounds in the rolling hills between Jackpot and Contact (Links 711, 714). In addition, increased public access and ground disturbing activities would result in some high initial impacts to crucial mule deer and pronghorn habitats, and bald eagle nesting and wintering habitats in this area (Links 101, 713, 715). No high residual impacts would be expected to occur along this segment of Route G following the mitigation.

North of the Windermere Hills near Wilkins, Nevada (Link 150) in the Thousand Springs Valley, initial impacts would be moderate to high where pronghorn winter range and sage grouse leks occur along the assumed centerline. There would be some high initial impacts to sage grouse leks on the northern end of Link 151. Initial impacts on Link 150 would be moderate to high. Following mitigation there would be no high residual impacts expected to occur along this segment of Route G, except for the long-term significant impacts to sage grouse.

Federal and state biologists are concerned that the SWIP would add yet another cumulative impact on sage grouse populations in southern Idaho and eastern Nevada (refer to cumulative effects section at the end of Chapter 4). Concern has focused on the increase in public access within sage grouse habitats, placement of towers and access roads in strutting or crucial wintering grounds, and the fact that predators of sage grouse (i.e., golden eagles) use the transmission towers as hunting perches. Adult and immature birds and nests are all thought to be vulnerable. Because there is no way to mitigate predation of sage grouse in these areas, these impacts would remain high even after mitigation and would be long term and significant. Eliminating access would be difficult. There would be some potential for disturbance and poaching in addition to the loss of habitat and disturbance due to construction activities.

From the Windermere Hills to Dolly Varden (Links 200, 211, 212, 230), potential impacts to wildlife for Route G would be the same as described for Route A. Then, from Dolly Varden to the North Steptoe Substation site (Links 241, 243, 245), potential impacts to wildlife for Route G would be the same as described for Route D.

From the North Steptoe Substation site to the Robinson Summit Substation site (Links 270, 280, 310), potential impacts to wildlife for Route G would be the same as described for Route B. Then, from the Robinson Summit Substation site to the Dry Lake Substation site, potential impacts to wildlife for Route G would again be the same as described for Route A.

Construction on Route G would likely have short-term effects on wild horse populations in the area. Part of the Butte HMA is included within this route and it is expected that construction activity would

likely result in horses moving away from human activity. No long term or significant impacts to these animals is anticipated, however.

Vegetation/Sensitive Plant Species - Elko rock-cress (*Arabis falcifructa*), a C2 species, occurs within one mile the assumed centerline of Route G in Thousand Springs Valley (Link 151). This plant would not be impacted if access to the right-of-way is adequately controlled. Other sensitive plant species potentially impacted along Route G are described under Route A (Links 41, 70, 670, 720).

Ely to Delta Segment

Direct Route

Wildlife - In Nevada, from the North Steptoe Substation site to the Little Hills (Links 262, 263, 265, 266), increased public access and ground disturbing activities would generally cause low to moderate impacts. High initial impacts would occur for 1 mile in Antelope Wash (Link 266) where increases in public access would be significant in areas of crucial pronghorn winter habitat and ferruginous hawk habitat. Mitigation measures (described at the beginning of this section) would reduce these impacts to insignificant levels.

Moderate initial impacts would also be expected along this route in the Schell Creek Range (Links 262, 263, and 620). There would be high initial impacts for 1.0 mile where sage grouse leks occur at the northern end of Spring Valley (Link 263). 2.6 miles of high initial impacts in sage grouse winter grounds would be expected to occur (between mileposts 3.0 and 5.0), where this route would cross Spring Valley (Link 266). 2.1 miles of high residual impacts to wintering bald eagle use areas would be expected to occur in the valley east of the Little Hills (Link 620). On Link 620, this route would result in high initial impacts from ground disturbance to bald eagle wintering areas for 2.1 miles.

Further east, the Direct Route would cross the Snake Valley, Tule Valley, and Swasey Bottom (Links 621, 630, 640) in Utah. Initial impacts would generally be low, moderate, and indiscernible in the vicinity of Delta (Links 572, 580, 581, 582). High initial impacts would occur for 3.6 miles from increased public access in the vicinity of the Leland-Harris Spring Complex (Link 630), where four federal candidate species (least chub, spotted frog, desert dace, and Great Basin silver-spot butterfly) are known to occur. High residual impacts from increased public access to the Leland-Harris Spring Complex would remain due to the potential long-term and cumulative effects of repeated public entry to this sensitive area. The BLM biologists are concerned that any direct impacts from construction activities or indirect, long-term impacts from increased public accessibility could endanger the survival of these sensitive species. Crossing of the Leland-Harris Spring Complex area would also require a permit under Section 404 of the Clean Water Act (1972) if any filling were to occur within jurisdictional wetland areas. In addition to concern for the Leland Harris Spring complex on Link 630, the Direct Route also crosses the Confusion Mountain and Swasey designated HMA's for wild horses. Included are 7.0 miles that are designated crucial wild horse habitat. Impacts to horses resulting from construction of the SWIP on Link 630 are likely to be of short term, related primarily to disturbance due to the presence of people and equipment. Initial impacts are considered to be moderate and residual impacts are projected to be low.

Except for the impacts to sage grouse leks (Links 263, 266, and 620) and the potential impacts to the Leland-Harris Spring Complex (Link 620), committed mitigation measures (described in the beginning of this section) would effectively mitigate these high initial impacts to insignificant levels. Residual impacts to sage grouse would be adverse, long term, and significant despite mitigative measures.

Federal and state biologists are concerned that the SWIP would add yet another cumulative impact on sage grouse populations in southern Idaho and eastern Nevada (refer to cumulative effects section at the end of Chapter 4). Concern has focused on the increase in public access within sage grouse habitats, placement of towers and access roads in strutting or crucial wintering grounds, and the fact that predators of sage grouse (i.e., golden eagles) use the transmission towers as hunting perches. Adult and immature birds and nests are all thought to be vulnerable. Because there is no way to mitigate predation of sage grouse in these areas, these impacts would remain high even after mitigation and would be long term and significant. Eliminating access would be difficult. There would be some potential for disturbance and poaching in addition to the loss of habitat and disturbance due to construction activities.

Initial high impacts to critical deer winter range and pronghorn habitat would occur for 0.7 miles from increased public access south of the Drum Mountains (Link 640). Mitigation measures (discussed in the beginning of this section) would effectively mitigate these impacts to insignificant levels.

Vegetation/Sensitive Plant Species - No known populations of sensitive plant species or communities are known to occur along the Direct Route.

Cutoff Route

Wildlife - From the North Steptoe Substation site to the Little Hills (Links 262, 263, 265, 266), this route would result in the same potential impacts to wildlife as described for the Direct Route.

Impacts from increased public access and ground disturbance activities along the remainder of the Cutoff Route (Links 267, 268, 462, 470, 540, 571, 572, 580, 581, 582) would be to pronghorn, mule deer, wild horses, bald eagles, sage grouse leks and sage grouse wintering grounds. In the northern portion of the Snake Valley (Link 267), high initial impacts would occur in pronghorn winter range, sage grouse leks, and bald eagle habitats. Further south in the Snake Valley (Link 268), the route would result in a total of 2.2 miles of high initial impacts to crucial pronghorn habitat and key deer winter range, as well as one golden eagle nest location. Five miles of high initial impact would occur where public access would increase significantly in critical deer and antelope winter range further south in the Snake Valley (Link 268). Moderate initial impact to wild horses can also be expected on Link 268 in the Conger Mountain HMA (mileposts 11 to 19). This route would result in another 2.4 miles of high initial impact to key deer winter range and migration corridors (between mileposts 21.3 to 23.6) in the Confusion Range (Link 462). Mitigation measures (discussed in the beginning of this section) would effectively mitigate these impacts to insignificant levels, except for the adverse and significant impacts to sage grouse leks on Link 267.

Federal and state biologists are concerned that the SWIP would add yet another cumulative impact on sage grouse populations in southern Idaho and eastern Nevada (refer to cumulative effects section at the end of Chapter 4). Concern has focused on the increase in public access within sage grouse habitats, placement of towers and access roads in strutting or crucial wintering grounds, and the fact that predators of sage grouse (i.e., golden eagles) use the transmission towers as hunting perches. Adult and immature birds and nests are all thought to be vulnerable. Because there is no way to mitigate predation of sage grouse in these areas, these impacts would remain high even after mitigation and would be long term and significant. Eliminating access would be difficult. There would be some potential for disturbance and poaching in addition to the loss of habitat and disturbance due to construction activities.

3.5 miles of initial high impacts to critical pronghorn habitat, key deer winter range, and deer migration routes would occur in the Confusion Range (Link 462). In addition, the route would result in 0.3 miles of high initial impact to pronghorn habitat in Whirlwind Valley (Link 470). No other high initial impacts would be expected to occur on the Cutoff Route. Mitigation measures (described at the beginning of this section) would be expected to effectively reduce these high impacts to insignificant levels.

Vegetation/Sensitive Plant Species - One known population of Great Basin Fishhook (*Sclerocactus pubispinus*) is known to occur along the assumed centerline of Link 462. Direct impacts could result from ground disturbance during the construction period and increased public access might result in the loss of specimens to plant collectors. Pre-construction surveys and mitigation measures designed to avoid populations of special status plant species would reduce residual impacts to a low level.

230kV Corridor

Wildlife - From the Robinson Summit Substation site to the Buckskin Hills, initial impacts along the 230kV Corridor Route from increased public access and ground disturbing activities would generally be moderate with scattered areas of high impact. On Link 350, 1.1 miles of initial high impacts would result because of sage grouse leks. Initial high impacts on Link 351 are associated with sage grouse leks and long-billed curlew habitat (0.8 miles), ferruginous hawk nests and habitat, sage grouse winter grounds, long-billed curlew and sandhill crane habitat (2.1 miles).

Link 370 has 4.5 miles of potentially high initial impacts as a result of the presence of ferruginous hawk nests and habitat, long-billed curlew and sandhill crane habitat, and bald eagle wintering grounds. On Link 380, a total of 9.4 miles of high initial impacts would be expected due to the presence of ferruginous hawk nests and habitat, sage grouse leks, long-billed curlew habitat, bald eagle wintering areas, elk and deer summer range, and crucial elk winter range.

A total of 1.6 miles of high initial impacts to key habitat areas for elk, critical pronghorn habitat, key deer winter range, (key) water source, and nesting areas for ferruginous hawks, and long-billed curlews would occur where the route crosses the southern end of the Schell Creek Range (Link 380) on the Humboldt National Forest and traverses the Snake Valley (Link 461). Initial high impacts on Link 462 (3.5 miles) would be reflected by the presence of critical pronghorn habitat, key deer winter range, and a deer migration area. There would be 0.3 miles of potential high initial impact associated with Link 470 (critical pronghorn habitat). No other high initial impacts from increased public access would be expected on the 230kV Corridor route.

Moderate initial impacts to wild horses are projected along portions of Links 461 and 462 in the Conger Mountain HMA. Impacts are expected along 7 miles of Link 461 and 12 miles of Link 462. These impacts are anticipated to be short term, occurring as a result of the presence of men and equipment during construction. Residual impacts within HMAs would be low to indiscernible.

Applying mitigation would result in only 0.1 miles of high residual impact to wildlife on the 230kV Corridor. Moderate residual impact persists in the Schell Creek Range (Link 380) where potential public access to long-billed curlew and ferruginous hawk habitat would increase significantly. With mitigation, most high initial impacts would be expected to be reduced to low or indiscernible for most of the route.

From the Buckskin Hills, in Utah, to the Intermountain Substation site (Links 462, 470, 540, 571, 572, 580, 581, and 582), potential impacts to wildlife for the 230kV Corridor Route would be same as those described for the Cutoff Route.

Vegetation/Sensitive Plant Species - One known population of Great Basin fishhook (*Sclerocactus pubispinus*) is known to occur along the assumed centerline of Link 462. Direct impacts could result from ground disturbance during the construction period and increased public access might result in the loss of specimens to plant collectors. Pre-construction surveys and mitigation measures designed to avoid populations of special status plant species would reduce residual impacts to a low level.

Southern Route

Wildlife -The Southern Route originates at the Robinson Summit Substation site and traverses south through Jake's Valley. Increased public access and ground disturbing activities would result in a total of approximately 54 miles of high initial impacts. On Link 364, 12.1 miles of high initial impact would be attributable to the presence of sage grouse leks on the route. Federal and state biologists are concerned that the SWIP would add yet another cumulative impact on sage grouse populations in southern Idaho and eastern Nevada (refer to cumulative effects section at the end of Chapter 4). Concern has focused on the increase in public access within sage grouse habitats, placement of towers and access roads in strutting or crucial wintering grounds, and the fact that predators of sage grouse (i.e., golden eagles) use the transmission towers as hunting perches. Adult and immature birds and nests are all thought to be vulnerable. Because there is no way to mitigate predation of sage grouse in these areas, these impacts would remain high even after mitigation and would be long term and significant. Eliminating access would be difficult. There would be some potential for disturbance and poaching in addition to the loss of habitat and disturbance due to construction activities.

Link 420 would have 6.2 miles of high initial impact due to potential disturbance to ferruginous hawk nests, ferruginous hawk habitat, antelope kidding grounds, and long-billed curlew habitat. There would also be high initial impacts to key deer winter range on Link 430, and critical pronghorn habitat on Link 450. Link 451 would be characterized by a substantial 28.5 miles of potentially high initial impact associated with the presence of a number of sensitive features including critical pronghorn habitat, key deer winter range, important water sources, raptor nesting areas, and ferruginous hawk nests. Most of the initial high impacts on this link (23.0 miles) would be associated with important pronghorn habitat. An additional 16 miles of moderate initial impact to wild horses are projected for Link 451 where it traverses the Burbank and King Top HMAs. There would be 0.5 miles of high initial impact on Link 490 associated with a known ferruginous hawk nest. In addition to these potentially high initial impacts, additional moderate effects to pronghorn, deer winter range, sage grouse leks, ferruginous hawk habitat and long-billed curlews would be anticipated.

Mitigation measures (described at the beginning of this section) would be expected to effectively reduce most of the high impacts along this route to insignificant levels, except for 10.3 miles of high residual impacts would remain due to unavoidable, long-term, deleterious effects on sage grouse leks on Link 364 (refer to discussion above).

From the Smelter Hills Substation site to the Intermountain Substation site (Links 571, 572, 580, 581, and 582), potential impacts to wildlife would be the same as described for the Cutoff Route. Residual impacts to wild horses within the Burbank and King Top HMAs are expected to be low to indiscernible.

Vegetation/Sensitive Plant Species - Isolated areas of high initial impacts are expected in areas where five species of sensitive plants that occur along the assumed centerline of this route would be directly impacted by ground disturbance. Two Category 2 species, compact catseye (*Cryptantha compacta*) and sand-loving buckwheat (*Eriogonum ammophilum*) occur at the southern tip of the Tule Valley (Link 451). A third Category 2 species, currant milk-vetch (*Astragalus uncialis*) occurs in the Swasey Wash on Link 490. low beard tongue (*Penstemon nanus*), an S3 species in Utah, has also been found along the assumed centerline in the Tule Valley (Link 451). Great Basin fishhook (*Sclerocactus pubispinus*), a species protected by the Cactus and Yucca Law of Nevada occurs along the assumed centerline near the southern end of the Snake Range (Link 430). This species, which is also a federal Category 3 candidate, also occurs on Link 451 in the Tule Valley of Utah.

Residual impacts to these species would be expected to be low following application of appropriate mitigation measures.

Populations of Great Basin fishhook (*S. pubispinus*), currant milk-vetch (*A. uncialis*), Jones globemallow (*Sphaeralcea caespitosa*), limestone buckwheat (*Eriogonum eremicum*), Calloway milk-vetch (*A. callithrix*), and terrace buckwheat (*E. natum*) occur within one mile of the study corridor assumed centerline in various areas. These plants, however, should not be directly impacted if access to the right-of-way is adequately controlled.

Avian Collision Hazards

An area of considerable concern for both the public and agency biologists is the potential of creating a significant collision hazard for raptors, waterfowl, and other larger species of birds by placing transmission lines in areas frequented by such species. Of particular concern is placement of such facilities in areas where such species occur during migration (i.e., Goshute Mountains) or may concentrate during some season(s) due to an abundance of forage, water, and/or cover (i.e., seasonally wet meadows such as the Murphy Meadows near the Kirch Wildlife Management Area in Nevada).

That man-made structures cause mortality in birds as a result of birds colliding with such structures is quite well documented (see Avery, et al., 1978 which contains 853 records of published accounts of such occurrences). The majority of avian mortality at man-made structures involves nocturnally migrating songbirds that collide with lighted structures including radio and television towers, airport celiometers, lighthouses, lightships, lighted chimneys or smokestacks, and cooling towers. Birds also collide with a variety of overhead wires, buildings, and windows. There have been documented cases of thousands of songbirds being killed over the span of only a few nights.

Most mortality occurs during the spring or fall migration, involves lighted structures, and occurs during periods of overcast weather. There are, however, virtually no data on songbird collisions with overhead wires. This problem is most often associated with large birds (waterfowl, pelicans, herons, etc.) with relatively low maneuverability and tendency to move about in flocks (Hoover, 1978; Beer and Ogilvie, 1972; Harrison, 1963; Ogilvie, 1967; Willard et al., 1977). Field feeding "puddle ducks" (i.e., pintail, mallard, shoveler, wigeon, and teal) are the most likely to sustain mortality from wire strikes due to their high speed flight and flocking behavior (Thompson, 1978; Boyd, 1961; Krapu, 1974).

The amount of mortality that occurs where conflicts exist between overhead lines and waterfowl appears to be quite low, possibly because overhead lines do not have the "attracting" qualities that

characterize lighted or light bearing structures. Kroodsma (1977) found that less than 1 percent of nonhunting mortality sustained by waterfowl at Redwing, Minnesota was due to collisions with overhead wires. Similarly, Stout and Cornwell (1976), summarizing available literature, generated a figure of 0.1 percent mortality due to line strikes. Lee (1978) estimated that 0.05 percent of bird flights (mostly waterfowl) in the vicinity of Bonneville Power Authority lines in Oregon resulted in fatal strikes.

The visibility of overhead wires is a major factor in the extent to which there is conflict with bird populations. Most collisions occur at night, during periods of foul weather, and/or at dusk and dawn (Thompson, 1978). High voltage transmission lines (i.e., 230kV and larger) may be less of a problem than smaller distribution lines or telephone/telegraph lines because of their greater size and, therefore, visibility (Thompson, 1978; Scott, et al., 1972). Lee (1978) found that 89 percent of birds flew over 230kV conductors, 9 percent flew under them, and 2 percent flew between conductors. This points up a problem with high voltage lines that has been discussed by Scott (1972). Most bird fatalities at such structures occur when birds attempt to fly over conductors and strike the smaller static or shield wires located a few to many feet above the conductors.

Within a local setting, the placement of transmission lines can have major significance relative to potential conflict with birds. Lines running parallel to movement corridors are much less of a problem than lines that run perpendicular to such corridors (Scott, et al., 1977). Thompson (1978) recommends clustering lines at river crossings, for example, in order to increase their visibility.

For new 230kV lines in corridors that already contain 230kV lines Thompson (1978) recommends that lines should be clustered in areas of bird concentration in order to make them more visible. The same is true in open country and feel it more appropriate to concentrate transmission lines within a single corridor rather than having numerous corridors, each with its own single line and separated from other such corridors by large distances (e.g., more than a mile).

A factor to consider in the placement of transmission lines is the behavior of birds in the placement area. This can be of significance to diurnal and nocturnal (i.e., migrating) birds alike. Areas where birds are likely to be landing or taking off in numbers rather than simply moving through an area represent poor locations for transmission line siting, especially smaller distribution lines.

Raptors are diurnal migrants, noted for their keen visual acuity. Given the size of conductor bundles that would be utilized in the SWIP, it is highly unlikely that collisions with the transmission lines would be significant. There is a possibility of occasional collisions between migrating raptors and the overhead shield wires that would be placed between towers to protect the system from lightning strikes. However, even these lines are fairly large (3/8 to 1/2 inch in diameter) and are likely to be avoided by the vast majority of migrating raptors.

Olendorff (1986) completed an analysis of raptor collisions with utility lines and concluded that "collisions with utility lines will always contribute to the proximate mortality of individuals, it does not seem likely that collisions could become an ultimate cause of population declines, except for critically endangered species such as the California condor." Olendorff's summary of known collisions by raptors with utility lines indicated that electrical transmission lines were involved in 26 of 72 documented collisions. Of the 26, 17 (65.4 percent) involved transmission lines with metal tower configurations. No data were available, however, on the relative importance of static wires versus conductor bundles as factors in these strikes (Olendorff, 1986, pg. 11).

It is interesting that an EIS in California estimated 20 cases of raptor mortality per year for a 50 mile transmission line. Olendorff and Lehman (1986, Raptor collisions with utility lines: an analysis using subjective field observations, Pacific Gas and Electric Co., San Ramon, CA.) issued a worldwide call for information on raptor mortality from collisions with utility lines. They received a total of 121 responses to their request for information. Of this number, only 88 could be analyzed due to inadequacy of information. Their conclusion: "Collision with utility lines apparently is a random, low level, and inconsequential mortality factor in raptor populations."

Collisions involving high voltage lines, regardless of the bird species considered, are very infrequent, highly random events that are unlikely to affect the long term probability of survival of any species within the SWIP corridors. There would undoubtedly be an increased level of raptor and other bird mortality within the SWIP corridors. However, the level of increased mortality likely to occur would not be measurable and would not adversely affect the population status of any raptor species. The annual mortality of raptors from illegal shooting in western Utah and eastern Nevada is probably far higher than would be experienced in a decade or two of presence of the SWIP transmission lines.

Potential Raptor Electrocution Hazard

Given the structural configuration of 500kV electrical transmission lines, the potential electrocution hazard to birds of prey is relatively minor. The 500kV transmission systems proposed for the SWIP would utilize tubular steel H-frame and/or steel lattice towers. Spacing of conductors on such structures is sufficient to prevent phase-to-phase or phase-to-ground contact. In order to achieve this safety measure, conductors are hung on the supporting structure in such a manner that they are 23 to 32 feet apart. Moreover, conductors are hung on insulating systems that would be 14 to 20 feet in length depending on tower design (see the SWIP DEIS/DPA pp. 2-12 through 2-14). Because of the distance of conductors from the support structure, other conductor bundles, static lines, and the ground, it is virtually impossible for even the largest species of raptor to be electrocuted as a result of alighting on conductors or the supporting tower.

Leland Harris Spring Complex

The Leland Harris Spring Complex is located in Snake Valley, Juab, and Millard Counties, in western Utah. Link 630 of the Direct Route between Ely, Nevada and Delta, Utah crosses the Snake Valley (Mileposts 0.0 - 10.0) just to the north of the spring complex (mileposts 3.0 - 5.0).

The Leland Harris Spring Complex provides habitat for several sensitive species: least chub (*Iotichthys phlegethontis*), western spotted frog (*Rana pretiosa*), western snowy plover (*Charadrius alexandrinus nivosus*), Great Basin silverspot butterfly (*Speyeria nokomis nokimis*), and a currently undescribed subspecies of dace (*Rhinichthys osculus*). With the exception of *Rhinichthys osculus*, all of these species are currently federal Category 2 candidates for listing among the threatened or endangered wildlife of the United States (FWS, 1991). The least chub is classified by the Utah Division of UDWR as a threatened species in Utah. The current distribution and occurrence of each of these species in the Leland Harris Spring complex is not completely known. The least chub was known to occur in the Leland Harris complex in 1977 and were also found there during surveys in 1985 (Osmundson, 1985). Osmundson (1985) did not find *Rhinichthys ocsculus* at Leland Harris. The western snowy plover, western spotted frog, and Great Basin silverspot butterfly are known to

have occurred at the Gandy Salt Marsh south of Leland Harris, and the silverspot butterfly has been recorded at Leland Harris as well (Richard Fike, BLM, Personal Communication to Geoffrey Pool, Dames & Moore, August, 1992). Given habitat similarities and proximity of the Gandy Salt Marsh to the Leland Harris complex, it seems reasonable to assume that most or all of these species are present at Leland Harris.

Link 630 of the Direct Route crosses the Snake Valley about one mile north of the northern-most spring in the Leland Harris complex that was sampled by Osmundson in 1985. To the east, in the Snake Valley, the link passes about 0.5 miles south of Miller Spring (S22, R18W, T14S). At its origin, Link 630 is 0.8 miles south of Coyote Spring. There are no identified springs directly on the assumed centerline. Consequently, it is expected that construction of the SWIP could occur on Link 630 with little or no impact to the Leland Harris Spring complex or the associated wetlands. Biologists with the BLM in Utah, however, disagree with this assessment and have expressed considerable concern over construction of Link 630. The BLM is concerned that even a small impact could cause the four species of concern known to occur in the vicinity of Link 630 to "go over the edge" which would require the request to the FWS for listing one or more them as Category 2 candidate species.

TABLES

TABLE 3-1

MILEAGE OF ALTERNATIVE ROUTES IN MILITARY AIRSPACE

		Alternative Routes									*Ely to Delta*			
	Link	**Route A**	**Route B**	**Route C**	**Route D**	**Route E**	**Route F**	**Route G**	**Utility**	**Agency Preferred**	**Direct**	**Cutoff**	**230 Corridor**	**Southern**
Hill AFB														
Lucin A MOA	221	0	3	0	0	3	0	0	0	3	0	0	0	0
	222	0	13.7	0	0	13.7	0	0	0	0	0	0	0	0
	223	0	0	0	0	0	0	0	0	9.7	0	0	0	0
Total		0	16.7	0	0	16.7	0	0	0	12.7	0	0	0	0
Lucin C MOA	211	0.7	0	0.7	0	0	0.7	0.7	0.7	0	0	0	0	0
	212	0.9	0	0.9	0	0	0.9	0.9	0.9	0.9	0	0	0	0
	223	0	0	0	0	0	0	0	0	3.5	0	0	0	0
Total		1.6	0	1.6	0	0	1.6	1.6	1.6	4.4	0	0	0	0
Gandy MOA	222	0	8.3	0	0	8.3	0	0	0	0	0	0	0	0
	226	0	17.4	0	0	17.4	0	0	0	0	0	0	0	0
	266	0	0	0	0	0	0	0	0	0	17	17	0	0
	267	0	0	0	0	0	0	0	0	0	0	17.1	0	0
	620	0	0	0	0	0	0	0	0	0	2.8	0	0	0
Total		0	25.7	0	0	25.7	0	0	0	0	19.8	34.1	0	0
Restricted-6405	222	0	0.7	0	0	0.7	0	0	0	0	0	0	0	0
	224	0	5.9	0	0	5.9	0	0	0	0	0	0	0	0
	226	0	4.4	0	0	4.4	0	0	0	0	0	0	0	0
	620	0	0	0	0	0	0	0	0	0	8.4	0	0	0
	621	0	0	0	0	0	0	0	0	0	2.2	0	0	0
	630	0	0	0	0	0	0	0	0	0	44.5	0	0	0
	640	0	0	0	0	0	0	0	0	0	2.6	0	0	0
Total		0	11	0	0	11	0	0	0	0	57.7	0	0	0
Sevier A	267	0	0	0	0	0	0	0	0	0	0	3.5	0	0
	268	0	0	0	0	0	0	0	0	0	0	18.8	0	0
	451	0	0	0	0	0	0	0	0	0	0	0	0	1.2
	461	0	0	0	0	0	0	0	0	0	0	0	12.3	0
	462	0	0	0	0	0	0	0	0	0	0	27.9	27.9	0
	470	0	0	0	0	0	0	0	0	0	0	12.6	12.6	0
	630	0	0	0	0	0	0	0	0	0	8	0	0	0
	640	0	0	0	0	0	0	0	0	0	2.6	0	0	0
Total		0	0	0	0	0	0	0	0	0	10.6	62.8	52.8	1.2

Table 3-1, Mileage of Alternative Routes in Military Airspace (Continued)

		Alternative Routes									Ely to Delta			
	Link	Route A	Route B	Route C	Route D	Route E	Route F	Route G	Utility	Agency Preferred	Direct	Cutoff	230 Corridor	Southern
Hill AFB														
Sevier B	451	0	0	0	0	0	0	0	0	0	0	0	0	67.9
	470	0	0	0	0	0	0	0	0	0	0	6.3	6.3	0
	490	0	0	0	0	0	0	0	0	0	0	0	0	9.1
	510	0	0	0	0	0	0	0	0	0	0	0	0	6.6
	540	0	0	0	0	0	0	0	0	0	0	6.9	6.9	0
	560	0	0	0	0	0	0	0	0	0	0	0	0	4.6
	571	0	0	0	0	0	0	0	0	0	0	7.6	7.6	7.6
	572	0	0	0	0	0	0	0	0	0	4	4	4	4
	580	0	0	0	0	0	0	0	0	0	1.5	1.5	1.5	1.5
	640	0	0	0	0	0	0	0	0	0	8.3	0	0	0
Total		0	0	0	0	0	0	0	0	0	13.8	26.3	26.3	101.3
Grand Total		1.6	53.4	1.6	0	53.4	1.6	1.6	1.6	17.1	101.9	123.2	79.1	102.5
Nellis AFB														
Reveille MOA	672	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	0	0	0	0
	673	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	19.2	0	0	0	0
Total		37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	37.3	0	0	0	0
Caliente West	673	3	3	3	3	3	3	3	3	3	0	0	0	0
	675	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	0	0	0	0
	690	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	0	0	0	0
Total		41.6	41.6	41.6	41.6	41.6	41.6	41.6	41.6	41.6	0	0	0	0
Sally Corridor	690	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6	0	0	0	0
	700	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	0	0	0	0
	720	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	0	0	0	0
Total		41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	41.4	0	0	0	0
Caliente Alpha	690	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	9.2	0	0	0	0
Total		129.5	129.5	129.5	129.5	129.5	129.5	129.5	129.5	129.5	0	0	0	0
Grand Total		131.1	182.9	131.1	129.5	182.9	131.1	131.1	131.1	131.1	90.9	123.1	79	105.7

TABLE 3-2

MILES NEAR WILDERNESS AREAS AND WSAs

MIDPOINT TO DRY LAKE ALTERNATIVE ROUTES

	Alternative Routes										Distance from Route		
Wilderness/WSA	Route A	Route B	Route C	Route D	Route E	Route F	Route G	Utility	Agency Preferred	Link	0-1/4 MILE	1/4-1 MILE	1-3 MILES
Lower Salmon Falls Creek WSA						▨				64	4.3	5.8	8.1
Goshute Canyon WSA				▨			▨	▨	▨	241	0	1.5	5.8
								▨	▨	244	0	0	5.4
Goshute Peak WSA		▨			▨					226	1.3	2.0	1.1
										225	0	1.4	4.5
		▨			▨					224	0	0	0.9
		▨			▨					222	0	0	5.9
Bluebell WSA		▨			▨					222	2.4	2.5	9.8
South Pequop WSA	▨		▨	▨		▨	▨	▨	▨	190	0.7	2.5	7.6
										230	0	0	6.2
Delamar Mountain WSA	▨	▨	▨	▨	▨	▨	▨	▨	▨	690	23.0	0.8	1.6
										680	7.0	4.5	5.1
Evergreen WSA	▨	▨	▨	▨	▨	▨	▨	▨	▨	690	8.8	1.2	0
Meadow Valley Mountain WSA										680	0.0	4.1	16.4
Fish & Wildlife 1, 2, & 3 WSA	▨	▨	▨	▨	▨	▨	▨	▨	▨	690	0.5	0	0
	▨	▨	▨	▨	▨	▨	▨	▨	▨	700	0	12.0	0
	▨	▨	▨	▨	▨	▨	▨	▨	▨	720	4.0	6.8	7.8
										750	3.5	0.7	2.4
Arrow Canyon WSA	▨	▨	▨	▨	▨	▨	▨	▨	▨	720	4.3	3.2	4.1
										730	3.7	5.5	1.6
										740	1.5	0.5	1.2
										770	1.2	0.5	0.2
										750	3.5	0.7	2.4

TABLE 3-3

MILES NEAR WILDERNESS AREAS AND WSAs

ELY TO DELTA ALTERNATIVE ROUTES

	Alternative Routes					Distance from Routes		
Wilderness/WSA	Direct	Cutoff	*230 Corridor	Southern	Link	0-1/4 MILE	1/4-1 MILE	1-3 MILES
Mount Moriah Wilderness				▨	267	0	0	2.6
Mount Grafton WSA				▨	364	0.4	4.1	5.3
Marble Canyon WSA	▨	▨			267	0	0.4	9.0
Wah Wah Mountains WSA				▨	451	0	0	0.9
King Top WSA				▨	451	3.0	0.1	6.1
Notch Peak WSA				▨	451	4.4	2.3	1.1
					480	3.2	0.6	0
		▨	▨		462	6.2	0.9	1.7
Howell Peak WSA		▨	▨		462	2.4	2.6	2.4
		▨	▨		470	0.8	0.4	1.7
					480	0.2	0.1	0.3
Swasey Mountain WSA		▨	▨		470	0	0	5.3
	▨				630	0	0	3.1
Fish Springs WSA	▨				630	0	0	4.8

* Agency Preferred Alternative

TABLE 3-4

MILES THROUGH HERD MANAGEMENT AREAS

MIDPOINT TO DRY LAKE SEGMENT

Herd Management Area (HMA)	Alternative Routes									Link	MILES WITHIN HMA
	Route A	Route B	Route C	Route D	Route E	Route F	Route G	Utility	Agency Preferred		
Toano HMA		■			■					222	6.2
Goshute HMA		■			■					222	9.0
Spruce-Pequop HMA				■						190	7.9
Cherry Creek HMA				■			■	■	■	241	14.7
								■	■	242	0.9
				■			■			243	0.6
							■	■	■	244	1.0
Antelope Valley HMA		■			■					226	22.0
	■		■	■		■	■	■	■	230	0.8
				■			■	■	■	241	15.0
	■		■			■				250	20.9
Antelope HMA		■			■					226	8.6
				■			■			245	3.0
	■		■			■				250	3.8
	■	■	■		■	■				259	6.0
	■	■	■		■	■				260	4.7
	■	■	■	■	■	■	■			261	4.9
Butte HMA		■					■	■		280	23.4
	■		■	■	■	■			■	293	6.5
Jakes Wash HMA										331	2.1
										332	2.7
	■	■	■	■	■	■	■	■	■	340	5.8
										361	23.0
	■	■	■	■	■	■	■	■	■	362	9.9
	■	■	■	■	■	■	■	■	■	363	11.7
										660	2.8
	■	■	■	■	■	■	■	■	■	669	0.7
White River HMA	■	■	■	■	■	■	■	■	■	669	13.6
Seaman HMA	■	■	■	■	■	■	■	■	■	670	3.4
										671	20.5
	■	■	■	■	■	■	■	■	■	672	6.1
Dry Lake HMA										671	21.2
	■	■	■	■	■	■	■	■	■	672	5.3
	■	■	■	■	■	■	■	■	■	673	20.5
										674	23.1

TABLE 3-5

MILES THROUGH HERD MANAGEMENT AREAS

ELY TO DELTA SEGMENT

Herd Management Area (HMA)	*Alternative Routes*					
	Direct	Cutoff	*230 Corridor	Southern	Link	MILES WITHIN HMA
Confusion HMA	▨				630	21.1 (7.6)
Swasey HMA	▨				630	6.9 (0.2)
Conger HMA		▨			268	8.0 (2.5)
			▨		461	6.8
		▨	▨		462	7.5
Antelope HMA	▨	▨			262	4.1
	▨	▨			263	9.6
					264	10.4
	▨	▨			265	4.0
	▨	▨			266	6.9
					610	4.9
Jakes Wash HMA				▨	364	4.1
Moriah HMA		▨			267	5.4
					610	6.0
			▨		620	7.9
King Top HMA				▨	451	6.2
Burbank Hills HMA				▨	451	6.9

Note : ( ) miles of area in high concern

* Agency Preferred Alternative

TABLE 3-6

Cultural Resource Data By Link

GISID	Site Number	Class	Type	Sensitivity	Comments
Link 463					
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
	CR5320	Historic	Trash	Moderate	early 1900s bottles and cans; project 921p
	26WP1930/CR5638	Historic	Concrete footings & trash	Moderate-High	mill site associated with Black Horse mine; ca 1903-1913; project 928p
	26WP1931/CR5639	Historic	Dump	Moderate	about 85 bottles & 300 cans; ca 1900-1950; project 928p
Link 464					
7804	26WP1557/CR2544	Prehistoric	Artifact scatter	Moderate	<100 jasper & obsidian flakes; <20 Shoshone sherds; possible mano; project 555p
7804	26WP1558/CR2541	Prehistoric	Isolate	Moderate	jasper flake; project 555p
7804	26WP1560/CR2543	Prehistoric	Isolate	Moderate	4 flakes; project 555p
7804	26WP1561/CR2540	Prehistoric	Artifact scatter	Moderate	<100 jasper & chert flakes; project 555p
7804	26WP1637/CR2714	Prehistoric	Lithic scatter	Moderate	6 jasper flakes; project 555p
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 465					
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 466					
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 467					
9904	26WP1380/CR781	Historic	Trash	Moderate	about 50 cans; also 1 obsidian flake
9905	CR5631	Prehistoric	Artifact scatter	Moderate	project 928p
9906	CR5454	Prehistoric	Isolate	Low	1 flake, 1 shatter; project 315p
9907	CR5417	Prehistoric	Isolate	Low	quartzite lithic debris; project 315p
9907	CR5418	Prehistoric	Isolate	Low	projectile point, lithic debris; project 315p

Table 3-6, Cultural Resource Data by Link (Continued)

GISID	Site Number	Class	Type	Sensitivity	Comments
Link 467 (Cont'd.)					
9908	CR5461	Prehistoric	Isolate	Low	2 flakes
9908	CR5462	Prehistoric	Isolate	Low	obsidian flake
9908	CR5463	Prehistoric	Isolate	Low	quartz core
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 468					
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 469					
	CR5322	Historic	Ranch house	Moderate-High	1880s adobe; project 921p
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 471					
	CR767	Prehistoric	Lithic scatter	Moderate	about 30 flakes; 1 projectile point fragment; project 315p
	CR768	Historic	Corral and chute	Moderate	may not be 50 years old; project 315p
	CR769	Prehistoric	Artifact scatter	Moderate	flakes and several project point fragments (Desert side-notched, Rosegate, large corner notched); 2 Snake Valley Gray sherds; project 315p
	CR773	Prehistoric	Lithic scatter	Moderate	several hundred obsidian biface thinning flakes; Rosegate and Humboldt concave base point fragments; project 315p
	CR5405	Prehistoric	Isolate	Low	<10 flakes; project 315p
	CR5406	Prehistoric	Isolate	Low	chert flake; project 315p
	CR5407	Prehistoric	Isolate	Low	obsidian biface; project 315p
	CR5408	Prehistoric	Isolate	Low	chert flake; project 315p
	CR5409	Prehistoric	Isolate	Low	obsidian point fragment; project 315p
	CR5410	Prehistoric	Isolate	Low	obsidian flake; project 315p
	CR5411	Prehistoric	Isolate	Low	obsidian flake; project 315p
	CR5412	Prehistoric	Isolate	Low	obsidian flake; project 315p
	CR5413	Prehistoric	Isolate	Low	1 chert and 1 quartzite flake; project 315p
	CR5414	Prehistoric	Artifact scatter	Moderate	Shoshone pot drop & 1 obsidian flake; project 315p

Table 3-6, Cultural Resource Data by Link (Continued)

GISID	Site Number	Class	Type	Sensitivity	Comments
Link 471 (Cont'd.)					
	CR5415	Prehistoric	Isolate	Low	1 chert and 1 obsidian flake; project 315p
	CR5416	Prehistoric	Isolate	Low	basalt scraper; project 315p
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 472					
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 473					
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280

Table 3-6, Cultural Resource Data by Link (Continued)

GISID	Site Number	Class	Type	Sensitivity	Comments
Link 471 (Cont'd.)					
	CR5415	Prehistoric	Isolate	Low	1 chert and 1 obsidian flake; project 315p
	CR5416	Prehistoric	Isolate	Low	basalt scraper; project 315p
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 472					
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280
Link 473					
28010	Snake Valley	Ethnohistoric	Goshute habitation area	Moderate	Malouf 1974:280

TABLE 3-7

Cultural Resources Recorded Along the Sacramento Pass Subroutes

Resource Sensitivities	Subroute 1	Subroute 2	Subroute 3	Subroute 4
Prehistoric				
Low	11 (isolates)	13 (isolates)	13 (isolates)	8 (isolates)
Moderate	4 (lithic or artifact scatters)	7 (lithic or artifact scatters)	7 (lithic or artifact scatters)	4 (lithic or artifact scatters)
Ethnohistoric				
Moderate	1 (habitation area)	1 (habitation area)	1 (habitation area)	1 (habitation area)
Historic				
Moderate	3 (trash sites and a corral)	1 (corral)	1 (corral)	1 (trash)
Moderate-High	2 (ranch and mill site)	1 (ranch)		
All Resources				
Low	11	13	13	8
Moderate	8	9	9	6
Moderate-High	2	1	0	0
Totals	21	23	22	14

TABLE 3-8

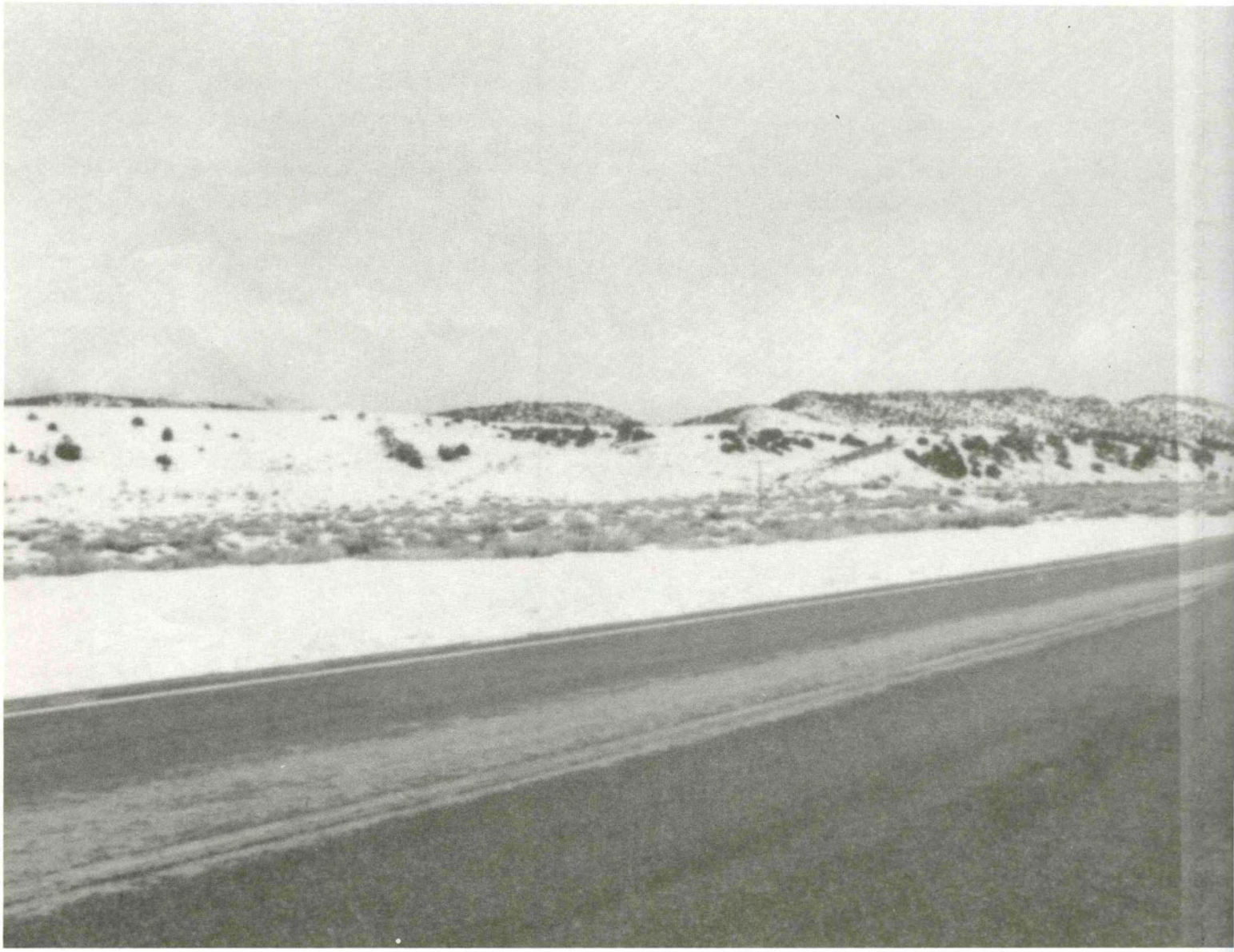
Cultural Resources Along the Sacramento Pass Subroutes

Resource Sensitivities	Subroute 1	Subroute 2	Subroute 3	Subroute 4
Prehistoric				
Low	11 (isolates)	13 (isolates)	13 (isolates)	8 (isolates)
Moderate	4 (lithic or artifact scatters)	7 (lithic or artifact scatters)	7 (lithic or artifact scatters)	4 (lithic or artifact scatters)
Ethnohistoric				
Moderate	1 (habitation area)	1 (habitation area)	1 (habitation area)	1 (habitation area)
Historic				
Moderate	3 (trash sites and a corral)	1 (corral)	1 (corral)	1 (trash)
Moderate-High	2 (ranch and mill site)	1 (ranch)		
All Known Resources				
Low	11	13	13	8
Moderate	8	9	9	6
Moderate-High	2	1	0	0
Totals	21	23	22	14
Predicted Sensitivities				
None	9.4	8.8	9.0	8.9
Low	3.8	3.2	2.3	1.1
Moderate	5.9	4.8	4.5	3.8
Moderate-High	1.4	4.9	4.9	5.6
Total Miles	20.5	21.7	20.7	19.4

TABLE 3-9

Summary of Cultural Resource Impacts

	None	Low	Moderate	Moderate-High	Total Miles
Subroute 1					
Direct Construction Impacts on Known Sites	20.5	0	0	0	20.5
Direct Construction Impacts on Predicted Sensitivity Zones	9.0	5.0	6.5	0	20.5
Public Accessibility Increase	20.5	0	0	0	20.5
Subroute 2					
Direct Construction Impacts on Known Sites	19.7	0.3	1.7	0	21.7
Direct Construction Impacts on Predicted Sensitivity Zones	8.4	4.3	9.0	0	21.7
Public Accessibility Increase	17.1	2.0	0	0	21.7
Subroute 3					
Direct Construction Impacts on Known Sites	18.7	0.3	1.7	0	20.7
Direct Construction Impacts on Predicted Sensitivity Zones	8.6	4.3	7.8	0	20.7
Public Accessibility Increase	17.6	2.0	0	0	20.7
Subroute 4					
Direct Construction Impacts on Known Sites	17.4	0.3	1.7	0	19.4
Direct Construction Impacts on Predicted Sensitivity Zones	8.9	3.4	7.1	0	19.4
Public Accessibility Increase	16.9	2.0	0	0	19.4



Prepared by: Dames & Moore

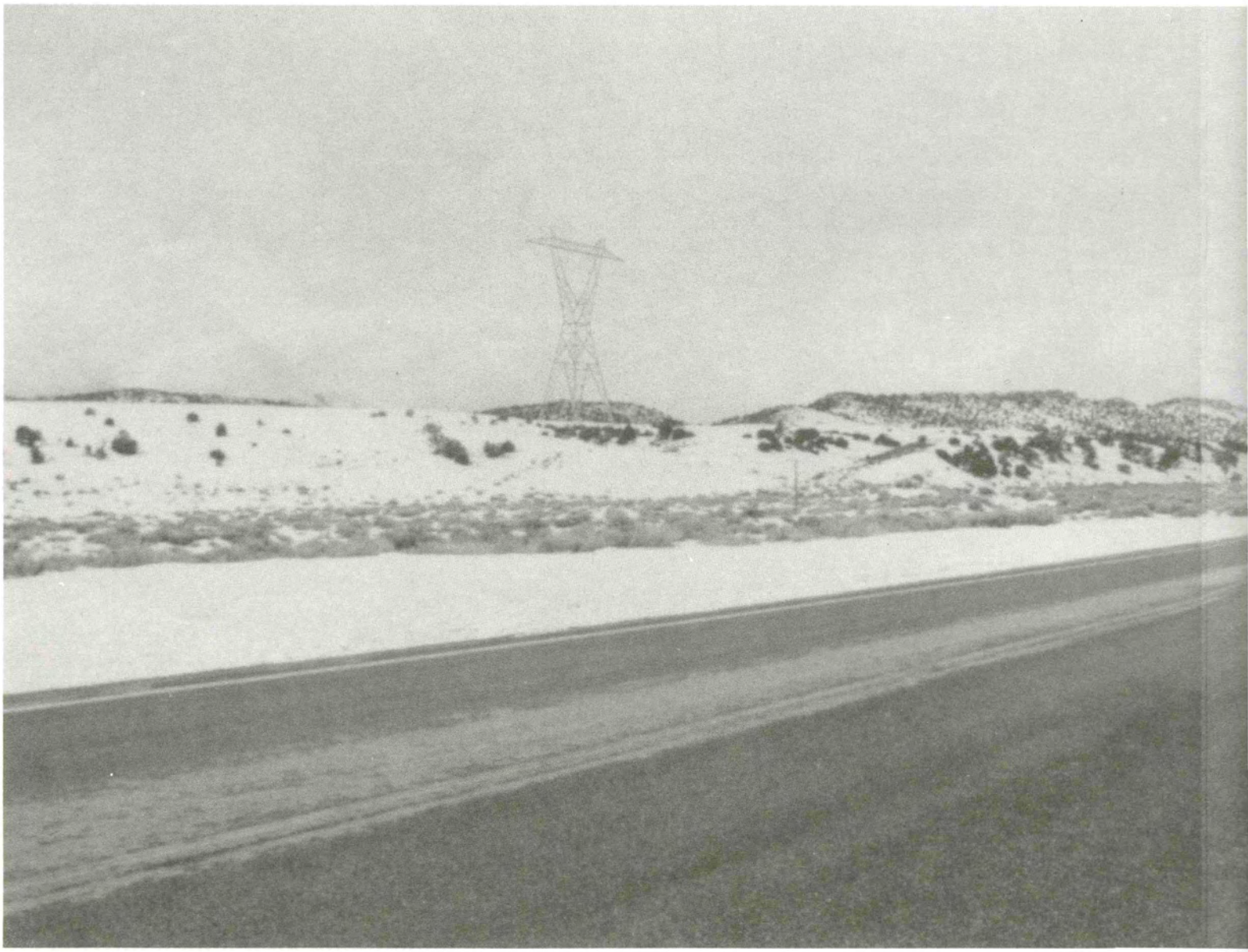
Southwest Intertie Project

SACRAMENTO PASS MITIGATION REROUTE

Subroute 1 - Crossing of U.S. Highway 6/50 (Link 463)

EXISTING CONDITIONS

Figure 3-13



Prepared by: Dames & Moore

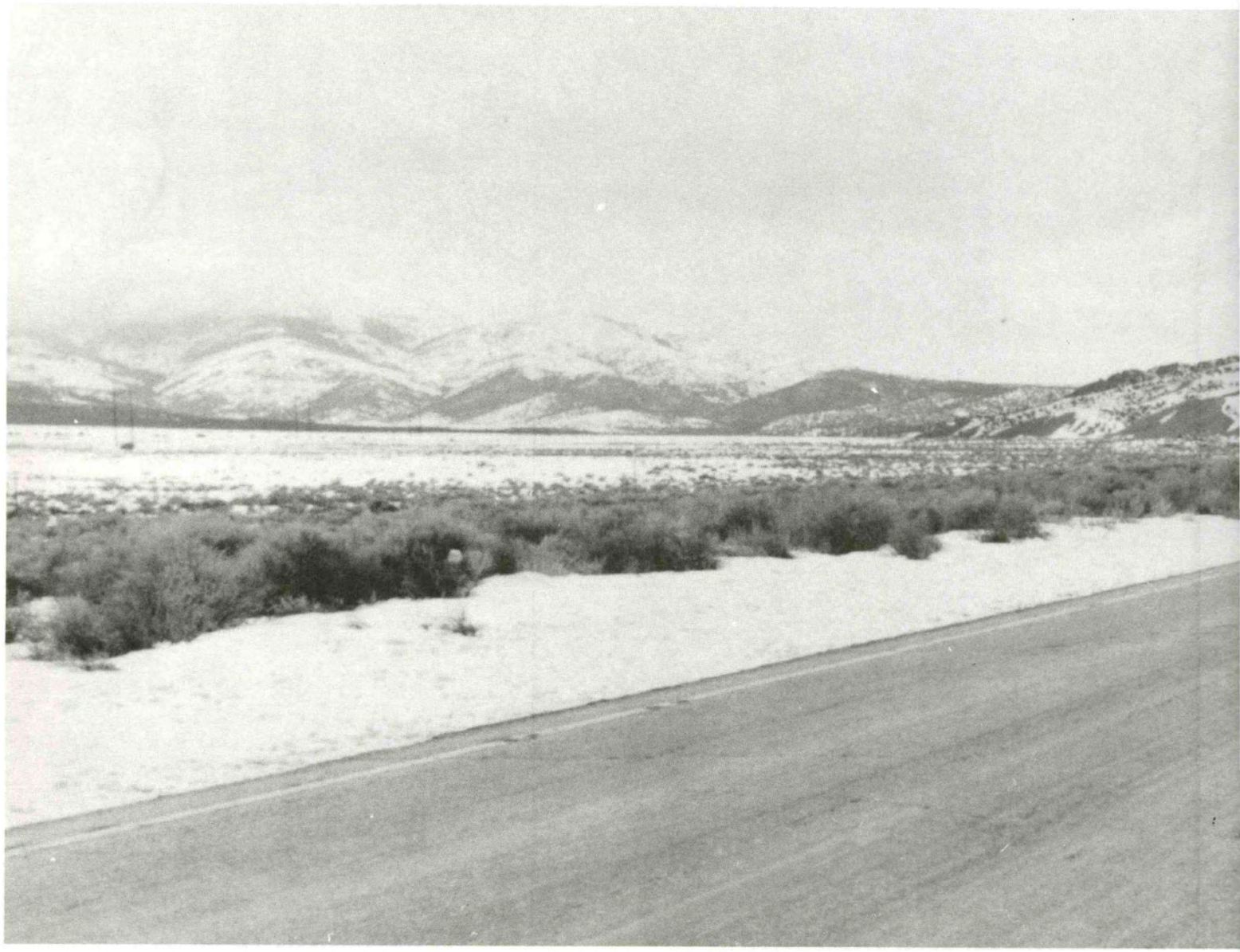
Southwest Intertie Project

SACRAMENTO PASS MITIGATION REROUTE

Subroute 1 - Crossing of U.S. Highway 6/50 (Link 463)

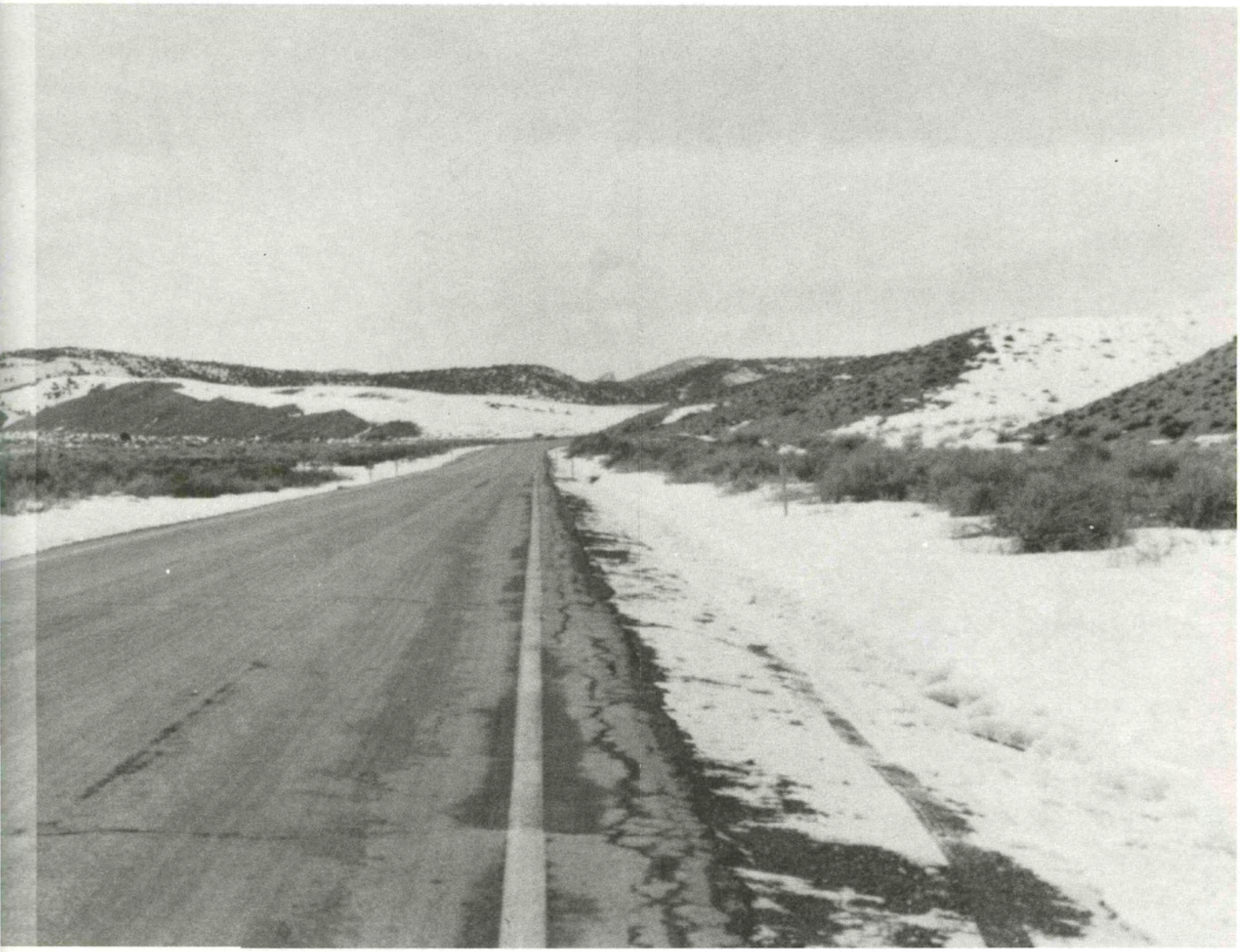
SIMULATION

Figure 3-14



Prepared by: Dames & Moore

Southwest Intertie Project

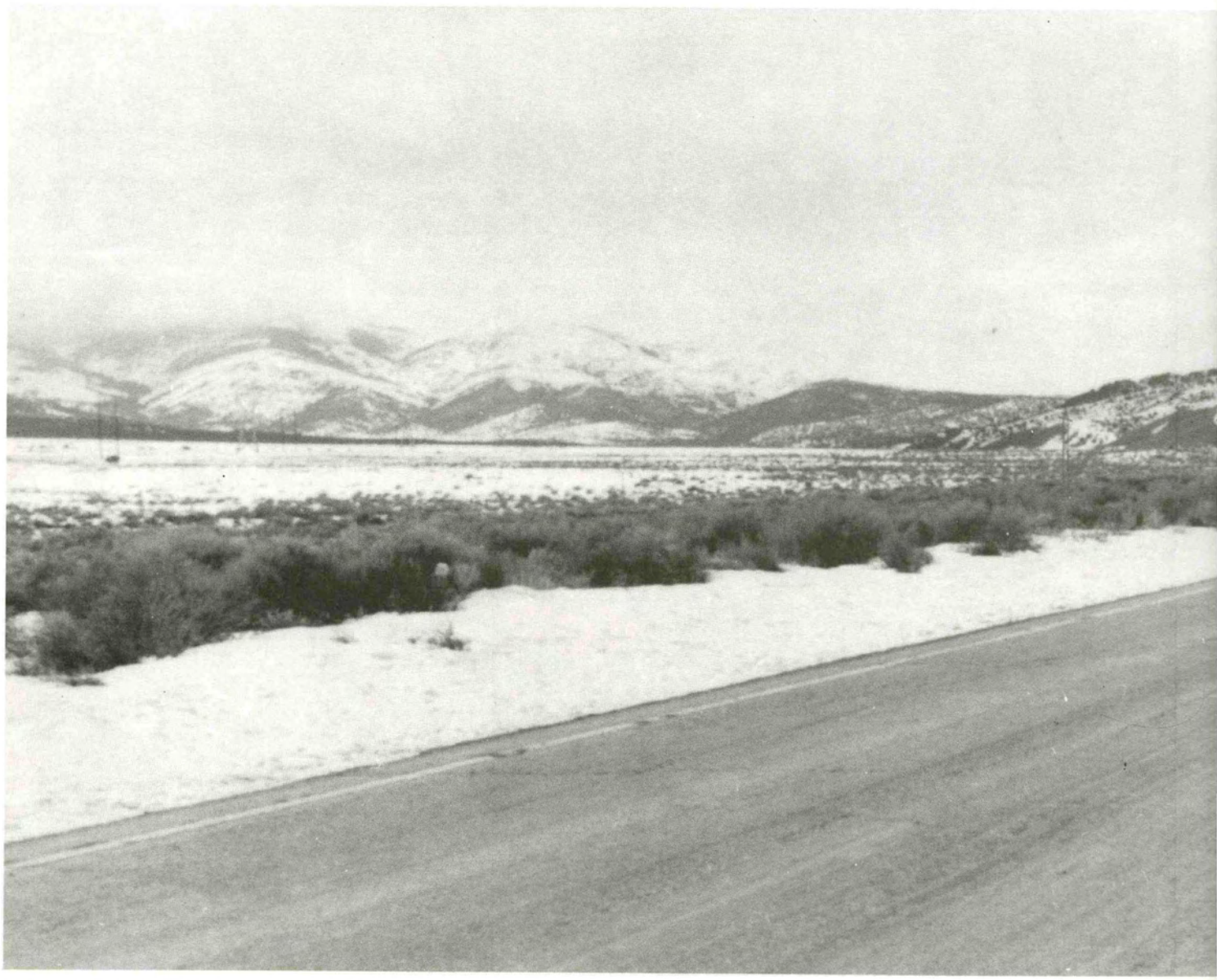


SACRAMENTO PASS MITIGATION REROUTE

Subroute 2 - Crossing of U.S. Highway 6/50 (Link 465)

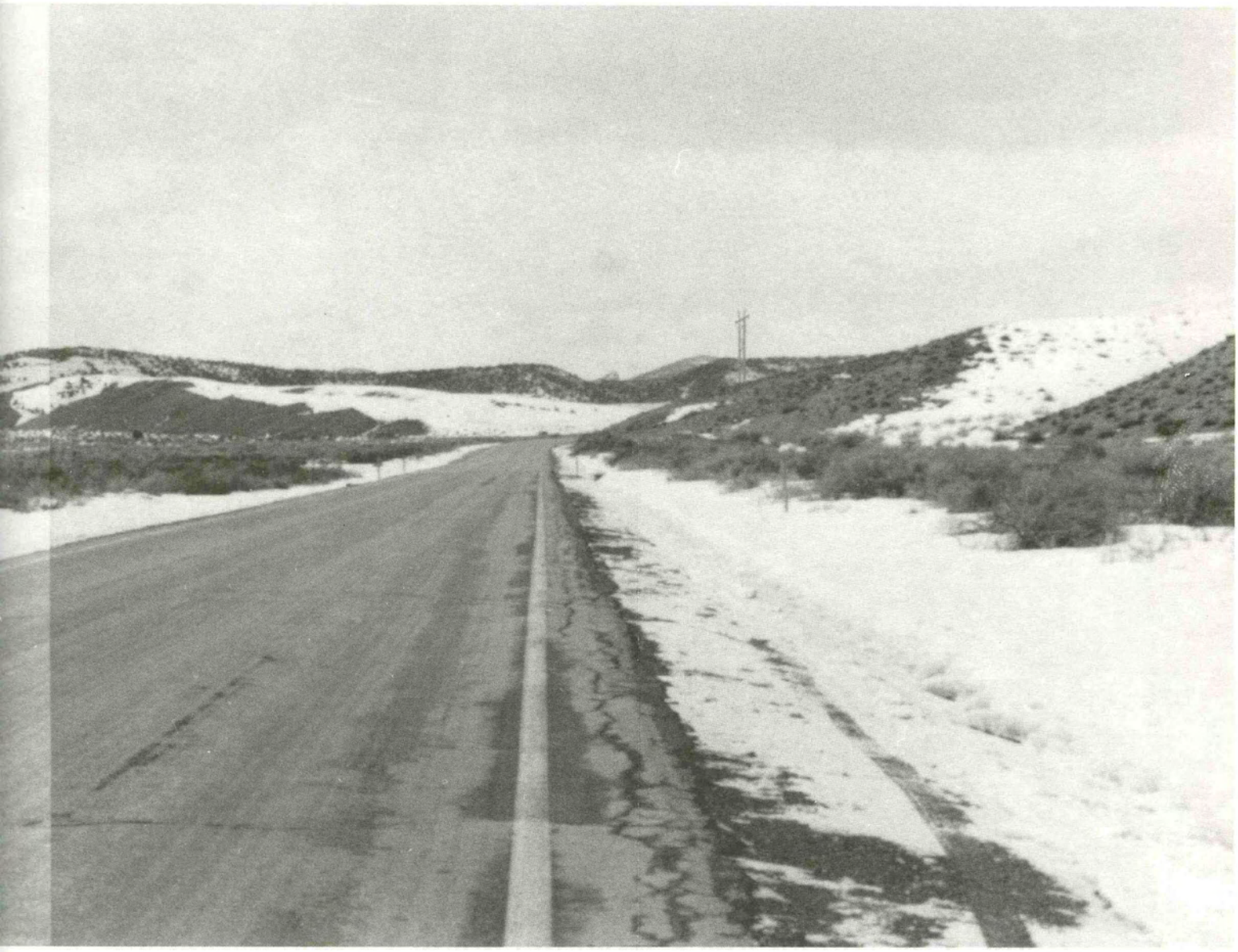
EXISTING CONDITIONS

Figure 3-15



Prepared by: Dames & Moore

Southwest Intertie Project

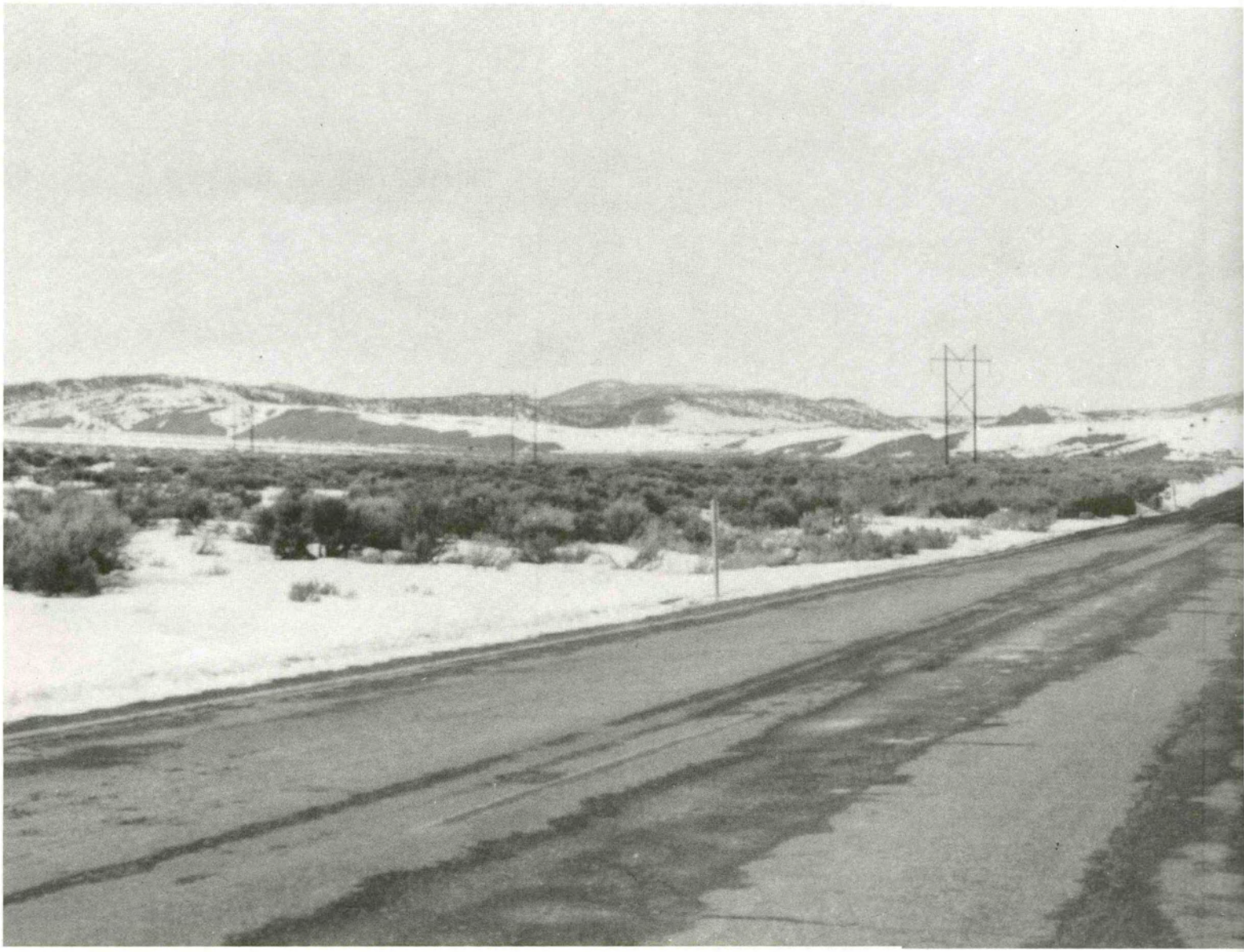


SACRAMENTO PASS MITIGATION REROUTE

Subroute 2 - Crossing of U.S. Highway 6/50 (Link 465)

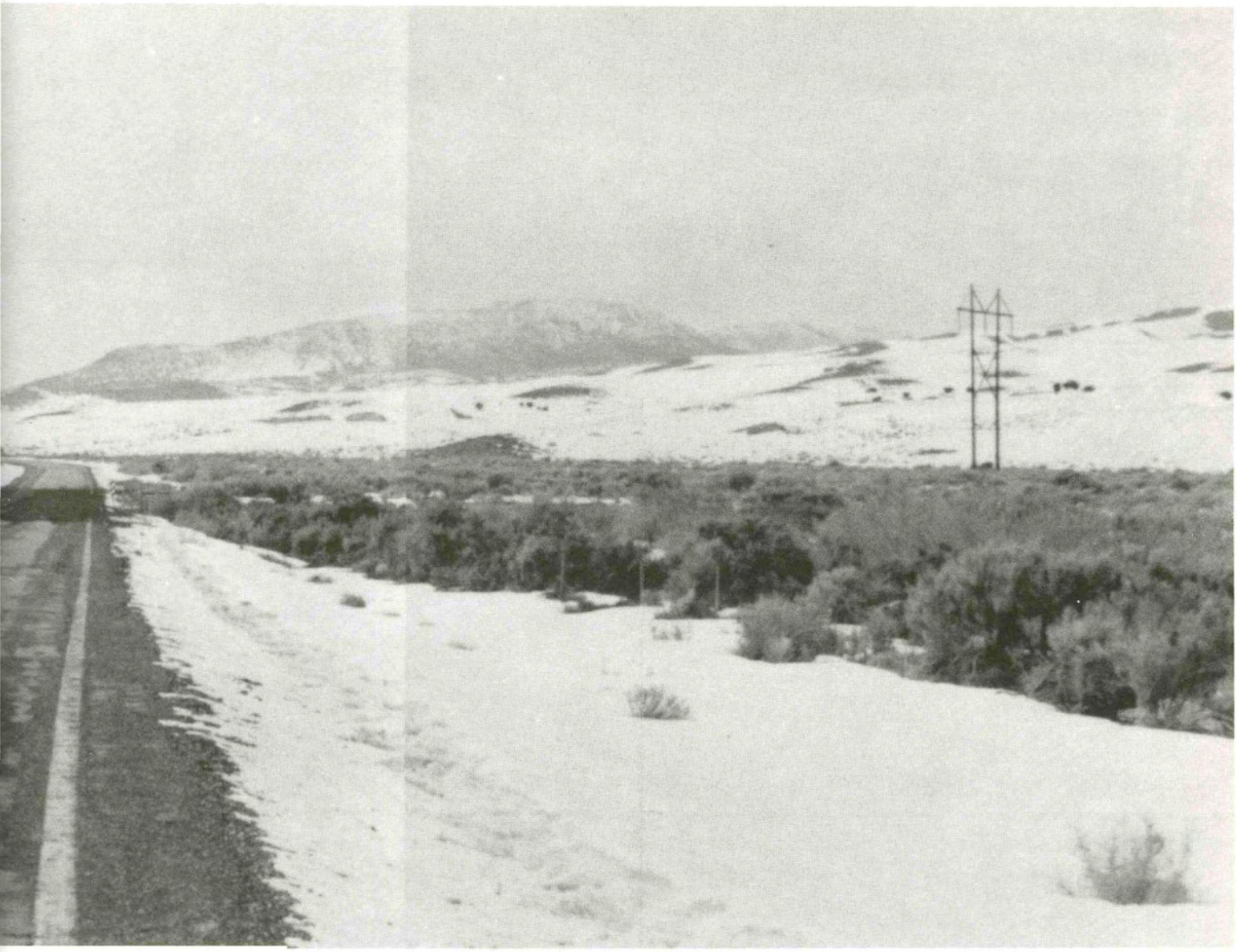
SIMULATION

Figure 3-16



Prepared by: Dames & Moore

Southwest Intertie Project

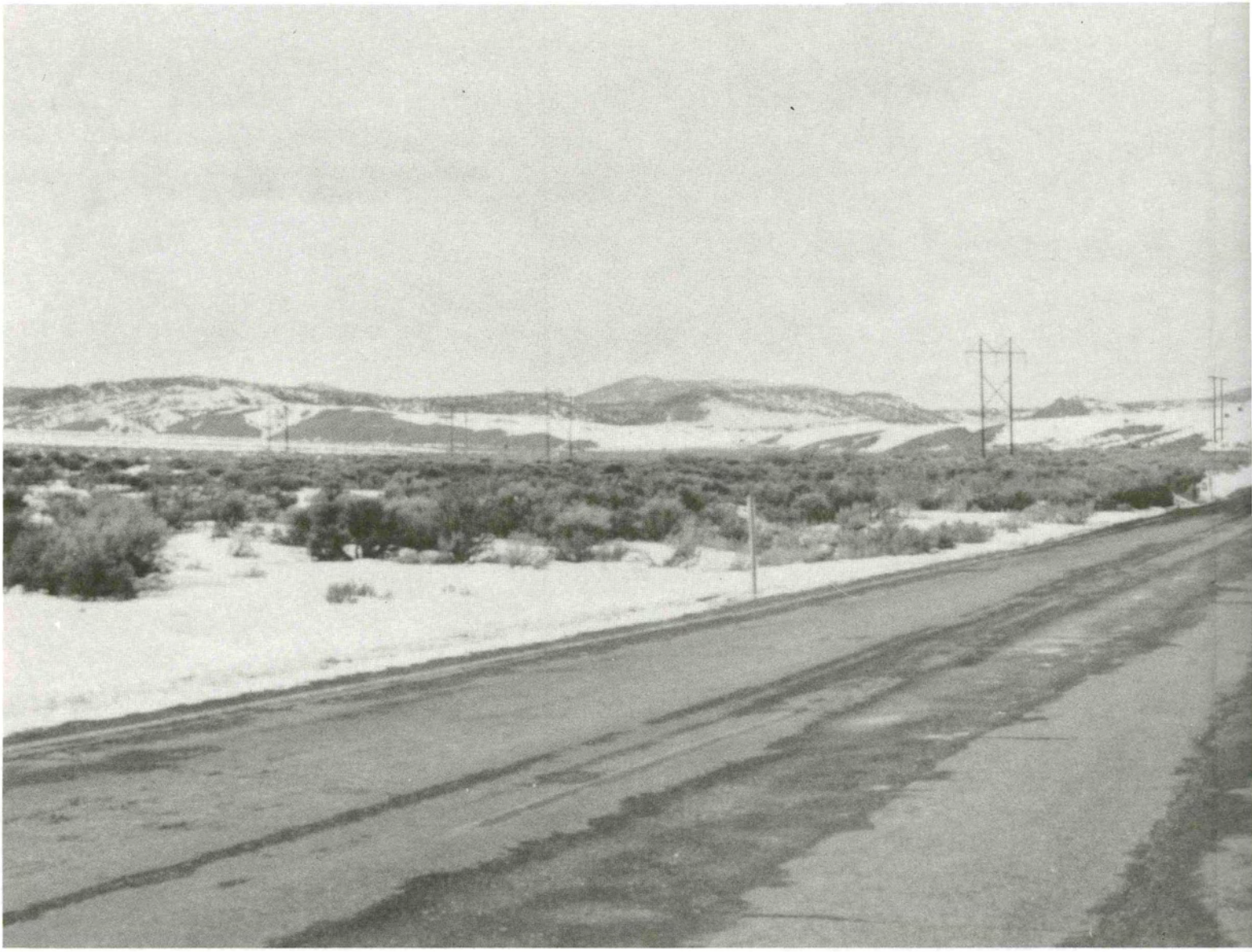


SACRAMENTO PASS MITIGATION REROUTE

Subroute 3 and 4 - Crossing of U.S. Highway 6/50 (Link 467 & 468)

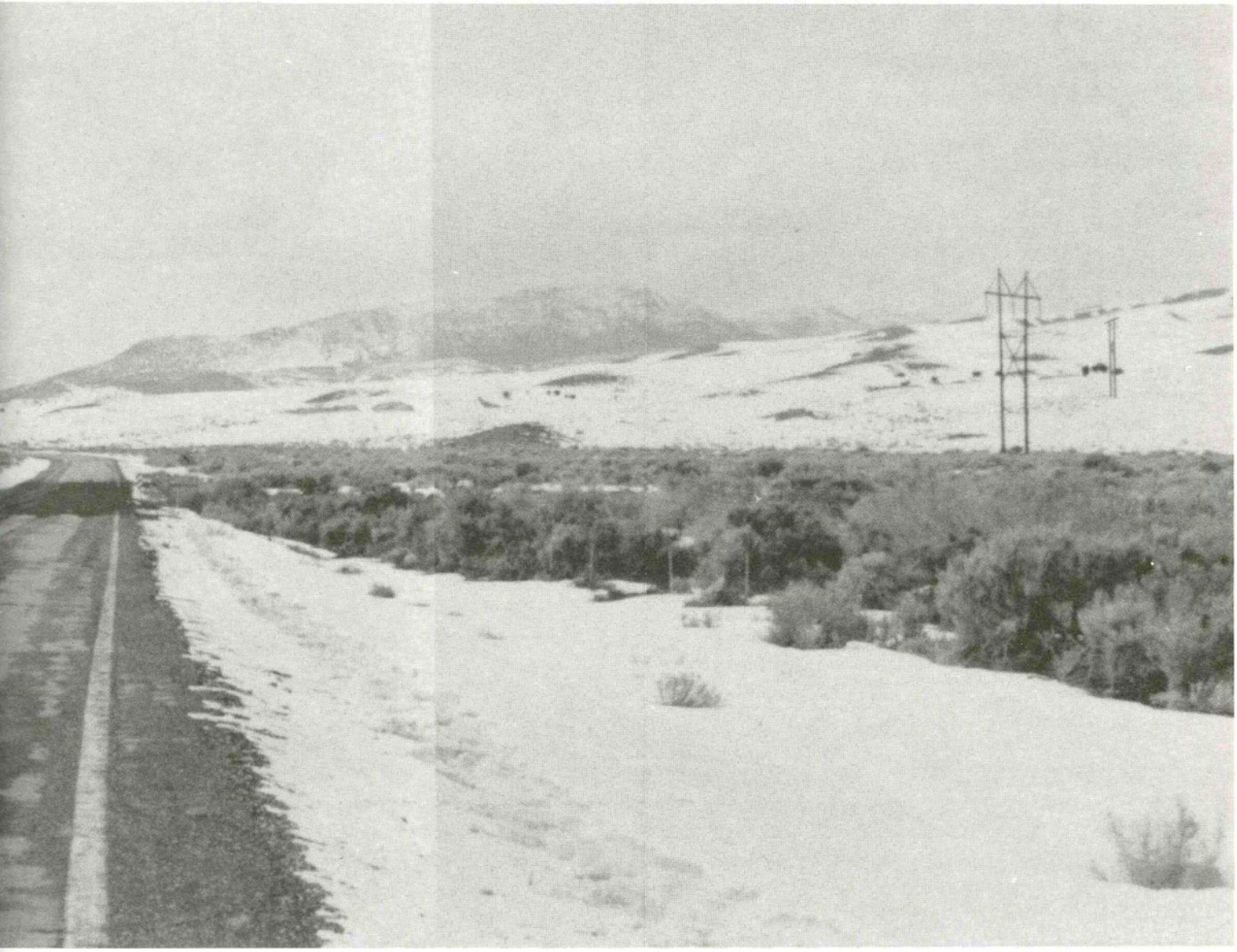
EXISTING CONDITIONS

Figure 3-17



Prepared by: Dames & Moore

Southwest Intertie Project

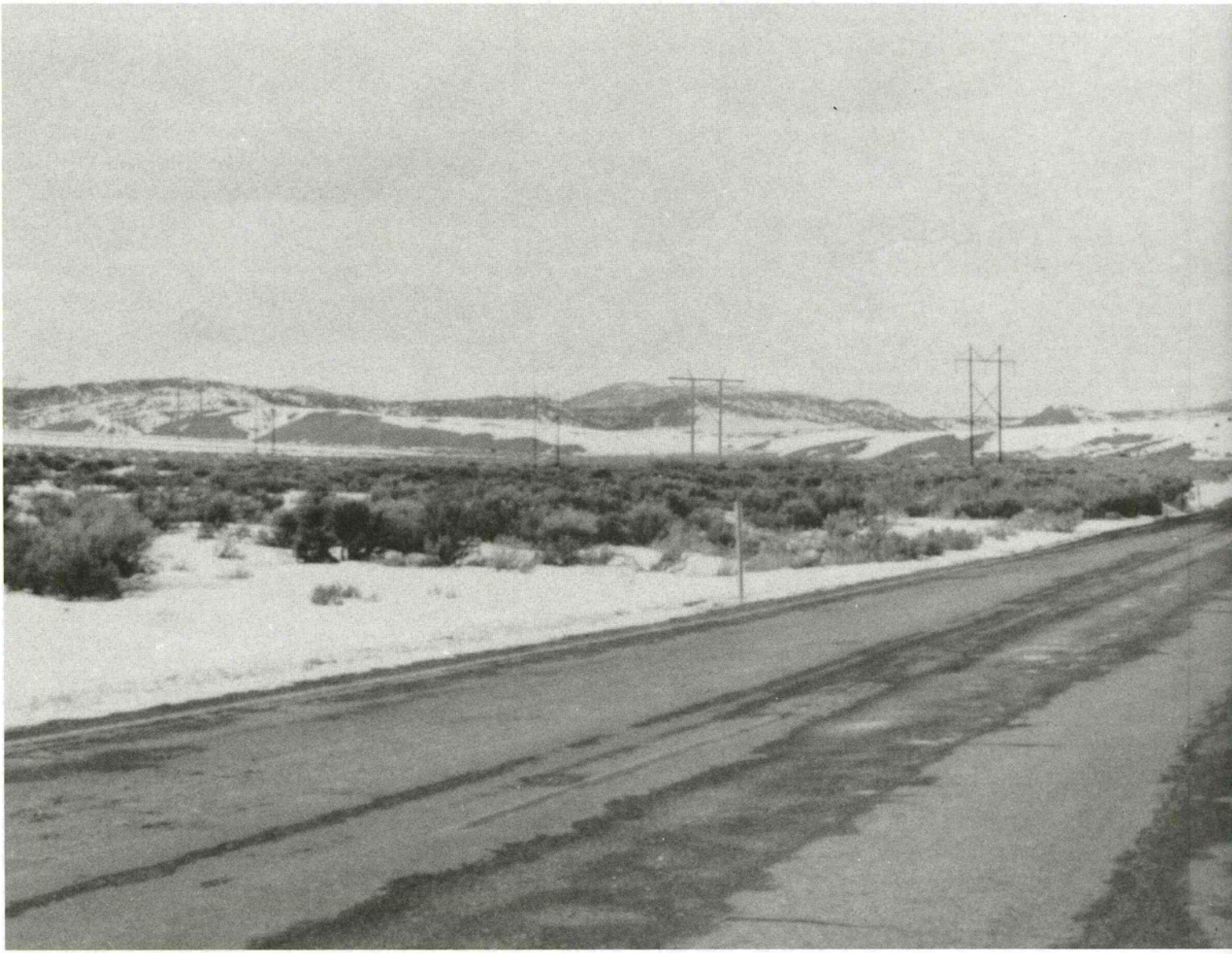


SACRAMENTO PASS MITIGATION REROUTE

Subroute 3 - Crossing of U.S. Highway 6/50 (Link 468)

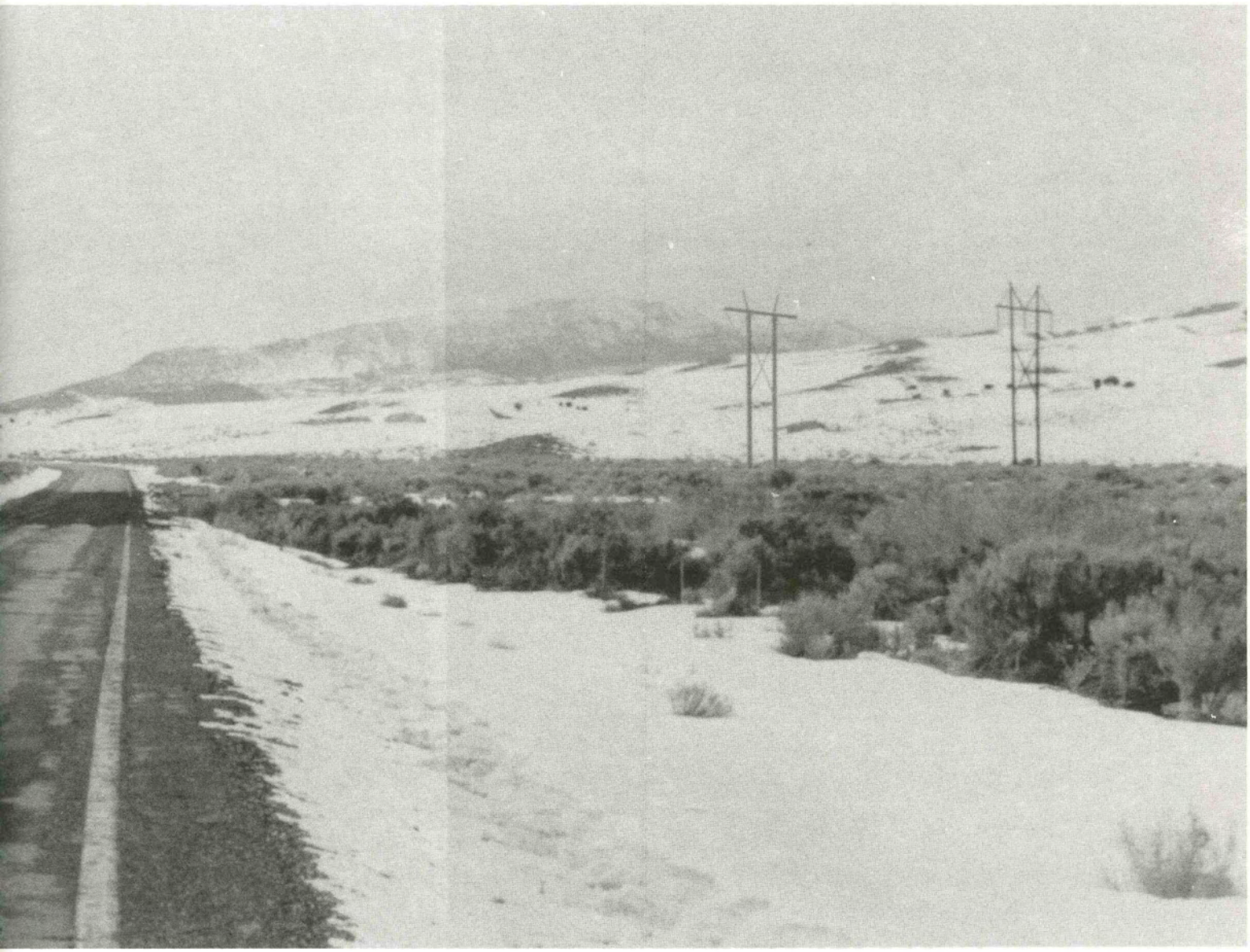
SIMULATION

Figure 3-18



Prepared by: Dames & Moore

Southwest Intertie Project



SACRAMENTO PASS MITIGATION REROUTE

Subroute 4 - Crossing of U.S. Highway 6/50 (Link 467)

SIMULATION

Figure 3-19