DOE-0323S1
SCH# 2006052119

Western
AREA POWER
ADMINISTRATION

SIERRA NEVADA REGION

Sacramento Area Voltage Support

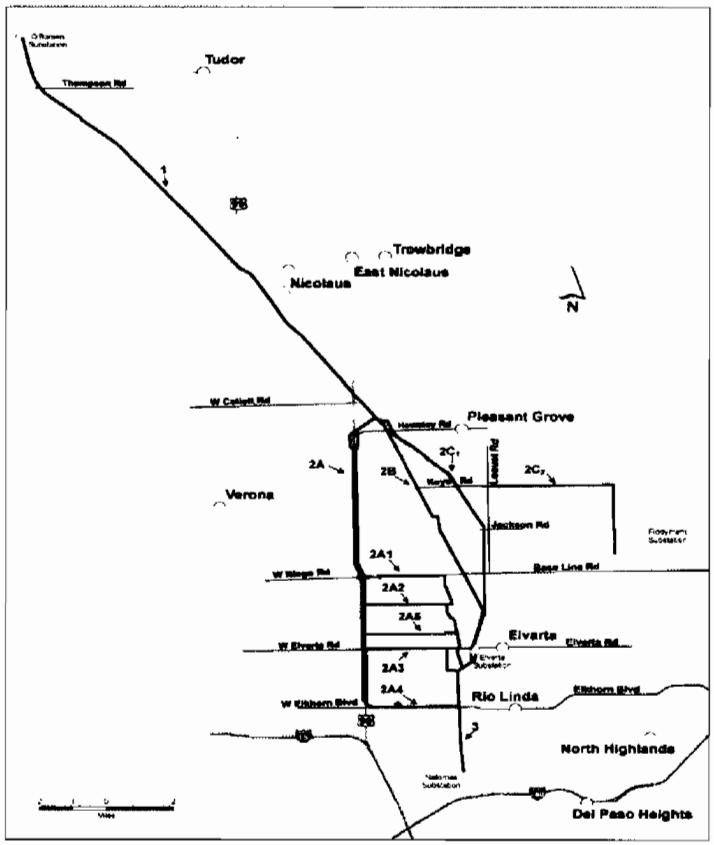
DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT AND ENVIRONMENTAL IMPACT REPORT

July 2007

NOTICE OF AVAILABILITY OF THE SACRAMENTO VOLTAGE SUPPORT DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT AND ENVIRONMENTAL IMPACT REPORT

To Responsible and Interested Parties:
The Sacramento Municipal Utility District (SMUD) and Western Area Power Administration (Western) have made available for public review and comment the Sacramento Voltage Support Draft Supplemental Environmental Impact Statement (SEIS) and Environment Impact Report (EIR) for the proposed construction and operation of approximately 31 to 38 miles of new, double-circuit, 230-kilovolt (kV) transmission line between Western's O'Banion Substation and the area just south of SMUD's Elverta Substation and the reconstruction of SMUD's existing 230-kV/115-kV transmission line between SMUD's Elverta and Natomas substations.

Project Location:
The proposed Project would be constructed using three route segments in Sutter, Sacramento, and Placer counties. The enclosed figure presents the general layout of the project. Segments 1 and 3 are common to each alternative. Seven potential alternative alignments were identified for Segment 2 that would connect Segment 1 to Segment 3 and only one would be chosen for the preferred alternative. Draft SEIS and EIR findings will provide Western, SMUD, and participating agencies with a basis for making a decision on if the Project should proceed and if so, under which alternative. Public comments will be evaluated when selecting a preferred alternative.



Significant Environmental Impacts:
This Draft SEIS and EIR is prepared pursuant to the National Environmental Policy Act (NEPA), Code of Federal Regulations Title 40, Parts 1500 to 1508 and Section 21080 of the California Environmental Quality Act (CEQA) to evaluate the environmental impacts associated with the construction and operation of the proposed Project. Seventeen environmental factors are the subject of analysis in this Draft SEIS and EIR: Air Quality, Biological Resources, Cultural Resources, Electric and Magnetic Fields, Environmental Justice, Floodplains, Geology, Health and Safety, Land Use, Noise, Paleontological Resources, Socioeconomics, Soils, Traffic and Transportation, Visual Resources, Water Resources, and Wetlands. After consideration of the proposed Project environmental protection measures, Western and SMUD have determined that except for Alternative C, Segment $2C_2$ there is little variation in impacts among alternatives. Alternative C, Segment $2C_2$ would conflict with the City of Roseville's visual resource policy and, therefore, result in a significant impact on visual resources.

California Government Code Section 65962.5:
The Project site is not located on any of the lists of sites specified by Section 65962.5, California Government Code, which include but are not limited to, the lists of hazardous waste facilities, land designated as hazardous waste property, and hazardous waste disposal sites.

Document Availability:
The entire document will be available on SMUD's web page at www.smud.org/about/reports/ceqa and hardcopies may also be reviewed at the following locations:

•South Natomas Public Library, 2901 Truxel Road, Sacramento, CA 95833
•Roseville Public Library, 225 Taylor Street, Roseville, CA 95678
•State Clearinghouse, 1400 Tenth Street, Sacramento, CA 95814

If you have questions or you would like a hardcopy or CD please contact the Western hotline at 1-866-859-5126.

Public Comment Forums:
SMUD and Western invite members of the public to attend the public comment forums regarding the Draft SVS SEIS and EIR. From 6:00 pm to 7:00 pm there will be an open house. At 7:00 pm, Western and SMUD will open the formal part of the meeting. Audience members will be given an opportunity to present oral comments or ask that written comments be read into the record. Comment forms and information will also be available. The meetings are scheduled August 7 and 8, 2007 as follows:

Tuesday, August 7, 2007
6:00-8:00 PM
City of Roseville Corporation Yard
Meeting Rooms 1 and 2
2005 Hilltop Circle Roseville, CA 95747

Wednesday, August 8, 2007
6:00-8:00 PM
SMUD HQ Auditorium
6201 S Street Sacramento, CA 95817

Accommodations are available for disabled individuals. If you need a hearing assistance device or other aid, or have questions, please contact Steve Tuggle at (916) 353-4549.

Public Comment Period:
A 45-day public comment period for this document begins July 13, 2007, and closes August 27, 2007. Written comments should be submitted to Steve Tuggle, Natural Resources Manager, Western Area Power Administration, Sierra Nevada Region, 114 Parkshore Drive, Folsom, CA 95630-4710, or electronically on the Western website, www.wapa.gov/SN.

Signature: for Ron Scott Date: JULY 5, 2007

Ronald Scott
Environmental, Health, and Safety Specialist III
Sacramento Municipal Utility District
(916) 732-5114

COVER SHEET

Type of Statement:	Sacramento Area Voltage Support Draft Supplemental Environmental Impact Statement (SEIS) and Environmental Impact Report (EIR)
Lead Agency:	Western Area Power Administration
Location:	Placer, Sacramento, and Sutter Counties, State of California
EIS Number:	DOE/EIS-0323S1
Contact:	Mr. Steve Tuggle, Natural Resource Manager Western Area Power Administration Sierra Nevada Region 114 Parkshore Drive Folsom, CA 95630 1-866-767-9272 (toll-free), telephone (916) 985-1936, fax email: svs-seis@wapa.gov
Website:	www.wapa.gov/sn
Hotline:	1-866-859-5126 (toll-free)

Abstract

Western Area Power Administration markets and transmits electricity from multi-use, Federal water projects. Western sells wholesale electricity to more than 70 preference customers in central and northern California and Nevada. Western's Sierra Nevada Region (SNR) includes the greater Sacramento, California, area. SNR maintains and operates numerous substations and more than 1,200 miles of transmission lines. These transmission lines are interconnected to other greater Sacramento-area transmission system owners, Load Serving Entities, and utilities, including the Sacramento Municipal Utility District (SMUD) and the City of Roseville (Roseville). Western's system contributes to and is affected by voltage stability, reliability, and security of the greater Sacramento-area transmission system. Transmission system studies performed in 2006 and 2007 showed that additions and upgrades are needed to maintain system voltage stability, reliability, and security in accordance with NERC and WECC Planning/Operations Reliability Standards, and for Western to continue to meet its legislative and contractual requirements. The resulting system additions and upgrades would also provide additional power importing capabilities to the greater Sacramento area. Therefore, Western proposes to construct approximately 31 to 38 miles of new, double-circuit, 230-kilovolt (kV) transmission line between Western's O'Banion Substation and the area just south of SMUD's Elverta Substation and reconstruct SMUD's existing 230-kV/115-kV transmission line between SMUD's Elverta and Natomas substations. Western prepared this Supplemental Environmental Impact Statement (SEIS) to comply with its requirements under the National Environmental Policy Act. SMUD and Roseville participated in the preparation of the joint SEIS and Environmental Impact Report (EIR) to comply with their requirements under the California Environmental Quality Act. The Sacramento Area Voltage Support SEIS and EIR contains a description of the proposed Project, existing environmental conditions for the project area, findings of environmental effects, and comparison of alternatives. Western has not selected a preferred alternative and will consider public comments in selecting one. Public comment forums will begin with a short presentation of the project and environmental analysis and follow with an opportunity for the public to provide oral or written comments:

August 7, 2007, 6:00-8:00 PM **City of Roseville Corporation Yard** **Meeting Rooms 1 and 2** **2005 Hilltop Circle**	**August 8, 2007, 6:00-8:00 PM** **SMUD HQ Auditorium** **6201 S Street** **Sacramento, CA 95817**

EXECUTIVE SUMMARY

ES.1 BACKGROUND

The Western Area Power Administration (Western) markets and delivers reliable, cost-based hydroelectric power and related services within the central and western United States. Western is one of four power marketing administrations within the U.S. Department of Energy, whose role is to market and transmit electricity from multi-use Federal water projects. Western markets energy from power plants operated by the U.S. Bureau of Reclamation (Reclamation), U.S. Army Corps of Engineers (USACE), and the International Boundary and Water Commission. Western's service area covers 1.3 million square miles, and its wholesale power customers provide service to millions of consumers in 15 western states. Western operates and maintains about 17,000 miles of transmission lines.

By law, Western markets power that is in excess of Federal project requirements. Western markets power to preference customers, such as Federal and state agencies, Native American tribes, electric cooperatives, municipal utilities, public utility districts, irrigation districts, and water districts. Western's Sierra Nevada Region (SNR) includes the greater Sacramento, California, area. SNR sells wholesale electricity to more than 70 preference customers in central and northern California and Nevada as part of the Central Valley Project (CVP) and the Washoe Project.

SNR maintains and operates numerous substations and more than 1,200 miles of transmission lines. These transmission lines are interconnected to other greater Sacramento-area transmission system owners, Load Serving Entities, and utilities including Sacramento Municipal Utility District (SMUD) and the City of Roseville (Roseville).

SMUD is one of the greater Sacramento-area transmission system owners, a Load Serving Entity, and an area electric utility that serves approximately 565,000 electric customers in Sacramento County and a portion of Placer County. SMUD is also the "Balancing Authority" for some of the greater Sacramento-area utilities and transmission system owners including Western. Roseville, a municipal utility, is also a Load Serving Entity and electric utility in the greater Sacramento-area that serves approximately 50,000 electric customers in Placer County.

ES.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

Western's system contributes to and is affected by voltage stability, reliability, and security of the greater Sacramento-area transmission system. Western must meet its project-use requirements and contractual obligations to customers for delivering power generated from Federal hydroelectric facilities.

Western regularly participates in transmission system studies with other greater Sacramento-area transmission system owners, Load Serving Entities, and utilities to address transmission system needs. In 2001-2002, these studies concluded that the system's existing transmission lines were reaching their maximum power transfer limits for serving the area's existing energy needs; therefore, transmission system additions and upgrades were necessary to maintain power system voltage stability, reliability, and security. Without transmission system additions and upgrades, North American Electric Reliability Council (NERC) violations could occur. Western and the interconnected transmission system owners, area Load Serving Entities, and area utilities are required to ensure that the system is operated in accordance with strict reliability standards established by NERC and the Western Electricity Coordination Council (WECC).

Since completion of the original transmission studies, the greater Sacramento-area transmission system has gone through significant changes. These changes include construction of new power plants, cancellation or indefinite delay of proposed power plants, and increase in the amount of power imported to the greater Sacramento area. The transmission system studies performed in 2006 and 2007 continue to show that the existing transmission lines in the greater Sacramento area have reached their maximum power transfer limits for serving the area's energy needs, particularly in the northern portion of the greater Sacramento area. Load Serving Entities and utilities in the area have taken interim measures to avoid potential uncontrolled system-wide outages. As a last resort, operators may be required to implement post-contingency load shedding and/or rotating blackouts. These solutions provide limited voltage stability improvement and are not always available or preferred. In addition, load shedding or rotating

blackouts can have a significant negative impact on utility customers.

Therefore, Western, greater Sacramento-area transmission system owners, Load Serving Entities, and utilities need transmission system additions and upgrades to maintain Western's, and the greater Sacramento-area transmission system voltage stability, reliability, and security in accordance with NERC and WECC Planning/Operations Reliability Standards and to continue meeting Western's legislative and contractual requirements. In addition, the resulting system additions and upgrades would provide additional power importing capabilities to the greater Sacramento area.

ES.3 PROPOSED PROJECT

In response to the need identified in the 2001 and 2002 transmission system studies, Western prepared a Draft Environmental Impact Statement (EIS) in November 2002 and a Final EIS in September 2003. A Record of Decision (ROD) was signed on January 12, 2004. The ROD was based upon the analysis in the EIS that concluded that if a project were to proceed, it should follow the configuration of the preferred alternative described in the Final EIS and was selected as the preferred alternative because it provided the highest level of voltage support, security, and reliability, while presenting relatively low environmental impacts. This alternative was identified as Alternative 2 Option B. This alternative included the following components:

1. Reconductoring the existing double circuit 230-kilovolt (kV) transmission line from Elverta Substation to Tracy Substation
2. Constructing a new double-circuit 230-kV transmission line from O'Banion Substation to Elverta Substation.
3. Realignment of the transmission line near Pleasant Grove Cemetery between O'Banion Substation and Elverta Substation and Option B of the Cottonwood-Roseville single circuit, 230-kV transmission line.

In 2005, SMUD and Roseville agreed to provide funding and Western decided to proceed with additional environmental review of the project. Based upon the 2006 and 2007 transmission system studies, Western, area transmission system owners, Load Serving Entities, and utilities identified the need to add transmission system improvements to the northern portion of the greater Sacramento area. These improvements would provide a higher level of voltage support, security, and reliability than the preferred alternative recommended in the FEIS. The proposed Project consists of the following components:

1. Constructing a new, double-circuit, 230-kV transmission line between O'Banion Substation and the area just south of the Elverta Substation. This transmission line would include a new circuit from O'Banion Substation to Elverta Substation and a new circuit from O'Banion Substation to Natomas Substation.
2. Reconstructing the existing double-circuit 230-kV/ 115-kV transmission line between Elverta Substation and Natomas Substation into a double-circuit 230-kV transmission line.

Western has responsibility to prepare this Sacramento Area Voltage Support (SVS) Supplemental EIS (SEIS) to analyze the environmental impacts from construction and operation of the proposed Project, according to the National Environmental Policy Act (NEPA). The SEIS will analyze the environmental impacts from the construction and operation of the proposed Project and its routing alternatives.

The proposed Project includes transmission facilities currently owned and operated by SMUD. SMUD obtains its authority from the State of California's Municipal Utility District Act. As a project participant, SMUD has responsibility under the California Environmental Quality Act (CEQA) to prepare an Environmental Impact Report (EIR). While Western is not subject to CEQA, Western and SMUD, with Roseville's participation, have prepared this joint Supplemental SVS SEIS and EIR as a stand-alone document to minimize the need for extensive cross-referencing to the original EIS. Its purpose is to analyze the environmental impacts from constructing and operating the proposed Project. Draft SEIS and EIR findings will provide Western and participating agencies with a basis for making a decision on if the Project should proceed and if so, under which alternative. Western would implement appropriate solutions under its Reclamation Law authority.

ES.4 PUBLIC INVOLVEMENT

Public involvement is a vital part of the decision-making process for this Draft SEIS and EIR. Western and SMUD have developed a public involvement program to provide multiple opportunities for comment during the Draft SEIS

and EIR process of public scoping, alternative formulation, alternative evaluation, and decision making. The program is intended to guide Western and SMUD through a collaborative, systematic, decision-making process to heighten public awareness and to encourage open communication throughout the development of the Draft SEIS and EIR. The process was designed for flexibility and responsiveness to the issues and needs of the public, Western's customers, and public agencies. The 45-day public comment period will begin upon publication of the Notice of Availability (NOA) for the Draft SEIS and EIR. Following is Western's anticipated schedule:

Public Scoping	May 9-July 15, 2006
Public Scoping Meetings	June 5 and 7, 2006
Release of Draft SEIS and EIR	July 2007
Public Comment Forum	August 2007
Public Comment Period Closes	45 days from Notice of Availability of Draft SEIS and EIR
Release of Final SEIS and EIR	Winter 2007/Spring 2008

ES.5 ROUTE SEGMENT DESCRIPTIONS

Western proposes to construct approximately 31 to 38 miles of new, double-circuit, 230-kV transmission line between Western's O'Banion Substation and the area just south of SMUD's Elverta Substation and reconstruct SMUD's existing 230-/115-kV transmission line between SMUD's Elverta and Natomas substations using three route segments. Figures ES-1 and ES-2 present the general layout of Route Segments 1, 2, and 3. Segments 1 and 3 are common to each alternative. Seven potential alternative alignments were identified for Segment 2 that would tie into Segment 3 between Elverta and Natomas substations.

Appendix B provides a summary of the segments with associated specific operations including the number of new structures, miles of new access roads, and acres of land that would be disturbed. Appendix C contains aerial photos of the line segments and mileposts. Segments are described in the following sections.

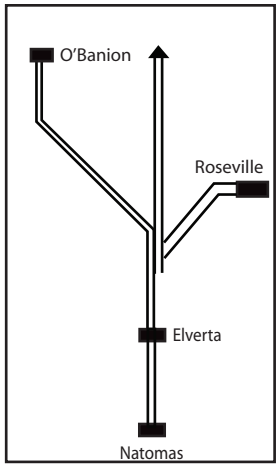
ES.5.1 Segment 1 – O'Banion Substation to Cross Canal

Segment 1 would consist of constructing about 17.1 miles of new double-circuit, 230-kV transmission line in new transmission line right-of-way (ROW) and adjacent to an existing transmission line ROW from O'Banion Substation to an area near Cross Canal. It would parallel the Sutter Bypass and cross the Feather River. Western does not anticipate the need to construct new access roads.

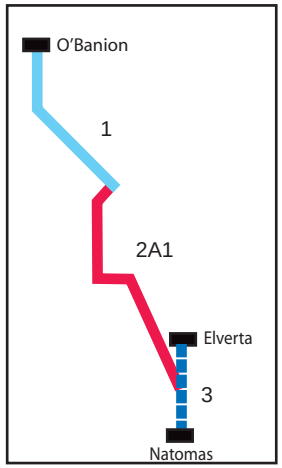
ES.5.2 Segment 2 – Cross Canal to South of Elverta Substation

Several alignments were originally considered for Segment 2. Preliminary screening was based primarily on which side of the road a segment should follow. As a result, four segments were eliminated from consideration in the Draft SEIS and EIR, primarily because of engineering constraints, as described in Appendix A. Three alignments were retained for Segment 2, including Segments 2A, 2B, and 2C. Segment 2A was further delineated into route Segments 2A1, 2A2, 2A3, 2A4, and 2A5 to evaluate various west-to-east routes between Highway 99 and points near East Levee Road. Segment 2 routes are described below.

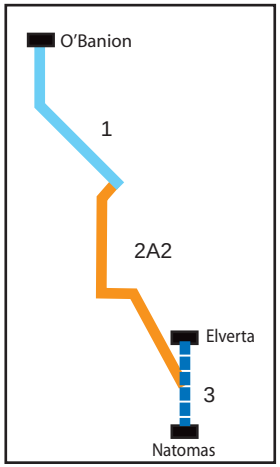
Segment 2A would consist of constructing about 11.6 to 13.5 miles of new double-circuit, 230-kV transmission line within a new ROW. This alignment would begin at the termination of Segment 1 and proceed about 0.7 mile along Cross Canal, then turn south along the east or west side of Highway 99. Segments 2A1, 2A2, 2A3, 2A4, and 2A5 present five alternative routes between Riego Road and Elkhorn Boulevard that connect the east or west Highway 99 route option east to a point near East Levee Road, then extend south and east to connect with SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation in



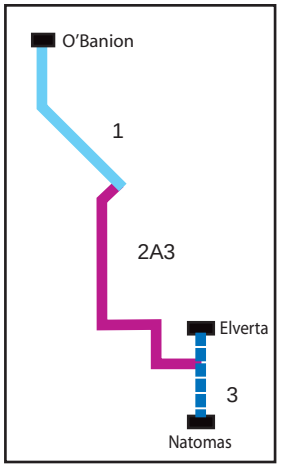
Existing 230-kV Transmission Line System No Action



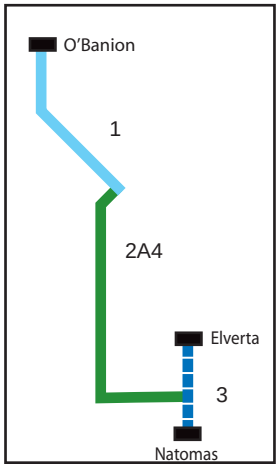
Alternative A1



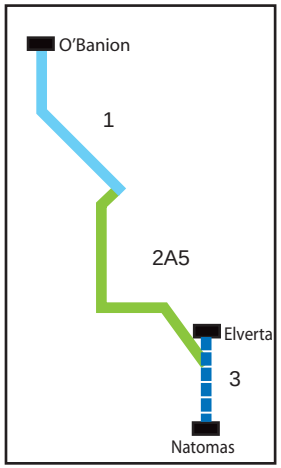
Alternative A2



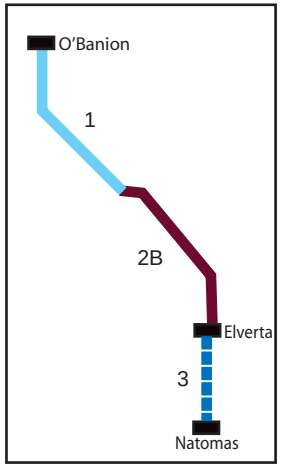
Alternative A3



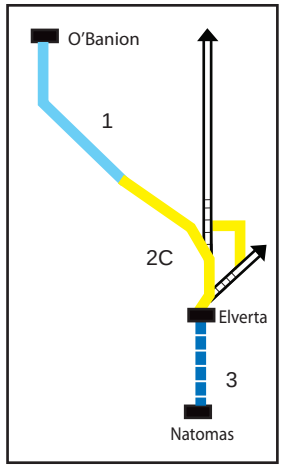
Alternative A4



Alternative A5



Alternative B



Alternative C

Existing 230-kV Transmission line

New Construction Within Existing ROW

New Construction Within New ROW

Abandonment

Substation

Notes:
- Colored segements correspond to route segments on Figure ES-2.

N

Figures not to Scale

Sacramento Area Voltage Support Supplemental EIS and EIR

Figure ES-1
General Layout of Alternatives

Sacramento County. Segments 2A1, 2A2, 2A3, 2A4, and 2A5 are further described below and shown in Figures 3.1-4 to 3.1-9. Each new 2A alignment would require new access roads.

ES.5.2.1 Segment 2A1 – South Side of Riego Road

Segment 2A1 would proceed south along the east or west side of Highway 99 for about 5.1 miles to Riego Road. The alignment would proceed east along the south side of Riego Road for about 2.4 miles, then turn south along the west side of East Levee Road for about 3.5 miles to intercept SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation.

ES.5.2.2 Segment 2A2 – North Side of Sutter County Line

Segment 2A2 would proceed south along the east or west side of Highway 99 for about 6.1 miles to the Sacramento/Sutter County Line. The alignment would proceed east along the north side of the county line in Sutter County for about 2.5 miles and then turn south along the west side of East Levee Road for about 2.3 miles to intercept SMUD's existing Elverta-Natomas transmission line south of Elverta Substation.

ES.5.2.3 Segment 2A3 – North Side of Elverta Road

Segment 2A3 would proceed south along the east or west side of Highway 99 for about 7.7 miles to West Elverta Road. The alignment would proceed east on the north side of Elverta Road for about 2.4 miles, and then turn south for about 0.8 mile and east for 0.3 mile to the west side of East Levee Road to intercept SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation.

ES.5.2.4 Segment 2A4 – North Side of Elkhorn Boulevard

Segment 2A4 would proceed south along the east or west side of Highway 99 for about 9.8 miles to West Elkhorn Boulevard. The alignment would then proceed east along the north side of Elkhorn Boulevard for about 2.8 miles to the west side of East Levee Road, where it would intercept SMUD's existing Elverta-Natomas transmission line about 2.2 miles south of the Elverta Substation.

ES.5.2.5 Segment 2A5 – Community Separator

Segment 2A5 would proceed south along the east or west side of Highway 99 for about 7.1 miles to a Community Separator[1] planned by the City of Sacramento north of Elverta Road. The alignment would proceed east along the Community Separator for about 2.8 miles, and then turn south along the west side of East Levee Road for about 1.2 miles to intercept SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation.

ES.5.2.6 Segment 2B – Cross Canal to Elverta Substation – Abandoned Railroad Right-of-Way Alignment

Segment 2B would require new ROW, which would follow the alignment of an abandoned railroad ROW from the termination of Segment 1 and proceed southeast to an area north of Rio Linda Boulevard. From there, it would proceed southwest within an existing transmission line ROW, around the west side of the existing Elverta substation, and tie into SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation. Small areas near Rio Linda Boulevard and Elverta Road also would require new transmission line easements.

ES.5.2.7 Segment 2C – Cross Canal to Elverta Substation – Eastern Alignment

Segment 2C consists of Segments $2C_1$ and $2C_2$. Segment $2C_1$ would consist of constructing about 9.4 miles of new double-circuit, 230-kV transmission line from the termination of Segment 1 near Cross Canal to an area near the Elverta Substation. Segment $2C_1$ would angle east from the existing transmission line to avoid houses then cross the line at about MP 0.5 to avoid the Pleasant Grove Cemetery near Howsley Road. Segment $2C_1$ would

[1] The Community Separator is an open-space area used for creating community form and image, and a sense of place, which provides clear separation between communities, defines the transition between urban and rural uses, and provides gateways that define entrances to a city. A greenbelt is proposed from the Sutter and Sacramento County lines to approximately one mile south of the county lines to separate Sutter County and Sacramento City's Urban Reserve Area. The Urban Reserve is the area outside of Sacramento City's Sphere of Influence in which future development and extension of municipal services are contemplated but not imminent.

then cross the existing transmission line at about MP 1.3 to avoid a farmer's house and cross back at about MP 2.2 to avoid a barn near Fifield Road. Segment $2C_1$ would again cross the existing transmission line at MP 3.0 to avoid structures and to use the existing Cottonwood-Roseville ROW from MP 5.1 to 8.0. The line would then continue south to tie into the Elverta-Natomas transmission line near the Elverta Substation. Small areas around Elverta Road would require new transmission line easements.

Segment $2C_2$ would be constructed to reroute the existing Cottonwood-Roseville 230-kV transmission line to the east to provide sufficient ROW for Segment $2C_1$ between MP 5.1 and 8.0. This reroute would originate at Structure 143/3 and proceed east with construction of new 230-kV transmission line for about 3.9 miles, then south for about 2.4 miles to rejoin the existing Cottonwood-Roseville transmission line between Structures 152/2 and 152/3. About 8.7 miles of existing Cottonwood-Roseville line would be abandoned from Keys Road to Sorento Road (Segment $2C_1$ MP 8.0) then northeast to the termination of Segment $2C_2$. Cottonwood-Roseville structures from Keys Road to just north of Jackson Road and from Segment $2C_1$ MP 8.0 to the termination of Segment $2C_2$ would be left in place and the conductors would be removed. Cottonwood-Roseville structures between MP 5.1 (Jackson Road) and Segment $2C_1$ MP 8.0 would be removed to provide ROW for Segment $2C_1$.

ES.5.3 Segment 3 – Elverta Substation to Natomas Substation

Segment 3 would consist of rebuilding about 4.8 miles of existing double-circuit, 115-kV/230-kV Elverta-North City and Elverta-Natomas transmission lines within an existing ROW between Elverta and Natomas substations. The existing transmission line structures and conductors would be removed prior to constructing the new structures and conductors. Foundations would be removed sufficiently below grade to allow for roadwork and infrastructure projects to occur in the future.

ES.6 ALTERNATIVES

Each alternative is identified as the abbreviated name of the Segment 2 option and includes the corresponding Segment 2 option, as well as Segments 1 and 3. For example, Alternative A3 includes Segments 1, 2A3, and 3. Table ES-1 shows disturbances from each alternative, which were summed from individual segment disturbances presented in Appendix B. Alternatives A1, A2, A3, A4, and A5 would have slightly different acreages of disturbance depending on whether the alternatives traverse the east or west side of SR 99; the higher values are used in this SEIS and EIR.

ES.6.1 Alternative A1

Alternative A1 includes Segments 1, 2A1, and 3. It would construct about 33.8 miles of new double-circuit, 230-kV transmission line on about 162 structures and would require up to 52.7 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission line.

ES.6.2 Alternative A2

Alternative A2 includes Segments 1, 2A2, and 3. It would construct about 33.7 miles of new double-circuit, 230-kV transmission line on about 162 structures and would require up to 52.6 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission line.

ES.6.3 Alternative A3

Alternative A3 includes Segments 1, 2A3, and 3. It would construct about 34.0 miles of new double-circuit, 230-kV transmission line on about 163 structures and would require up to 53.1 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission line.

ES.6.4 Alternative A4

Alternative A4 includes Segments 1, 2A4, and 3. It would construct about 35.4 miles of new double-circuit, 230-kV transmission line on about 170 structures and would require up to 55.6 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission line.

ES.6.5 Alternative A5

Alternative A5 includes Segments 1, 2A5, and 3. It would construct about 33.9 miles of new double-circuit, 230-kV transmission line on about 163 structures and would require up to 52.9 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission line.

Table ES-1. Summary of New Disturbance for Each Alternative

Alternative Description	Total Miles	Total ROW Acres	New Structures[a]			Access Roads[b]			Pulling Sites[c]		Material Storage[d]		Total Construction Acres	Total Long-term Acres
			Approximate Number	Construction Acres	Long-term Acres	Miles	Construction Acres	Long-term Acres	Number	Construction Acres	Number	Construction Acres		
A1-East[e]	33.6	509.1	161	37.1	1.6	28.8	52.4	52.4	12	4.8	2	10.0	104.3	54.0
A1-West[f]	33.8	512.1	162	37.3	1.6	29.0	52.7	52.7	12	4.8	2	10.0	104.8	54.3
A2-East[e]	33.5	507.6	161	37.0	1.6	28.7	52.2	52.2	12	4.8	2	10.0	104.0	53.8
A2-West[f]	33.7	510.6	162	37.2	1.6	28.9	52.5	52.5	12	4.8	2	10.0	104.6	54.2
A3-East[e]	33.8	512.1	162	37.3	1.6	29.0	52.7	52.7	12	4.8	2	10.0	104.8	54.4
A3-West[f]	34.0	515.1	163	37.5	1.6	29.2	53.1	53.1	12	4.8	2	10.0	105.4	54.7
A4-East[e]	35.2	533.3	169	38.9	1.7	30.4	55.3	55.3	12	4.8	2	10.0	108.9	56.9
A4-West[f]	35.4	536.3	170	39.1	1.7	30.6	55.6	55.6	13	5.2	2	10.0	109.9	57.3
A5-East[e]	33.7	510.6	162	37.2	1.6	28.9	52.5	52.5	12	4.8	2	10.0	104.6	54.2
A5-West[f]	33.9	513.6	163	37.4	1.6	29.1	52.9	52.9	12	4.8	2	10.0	105.1	54.5
B	31.3	474.2	150	34.6	1.5	26.5	48.2	48.2	11	4.4	2	10.0	97.1	49.7
C	37.6	569.7	180	41.5	1.8	23.4	42.5	42.5	13	5.2	2	10.0	99.3	44.4
No Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Burleson 2007

[a] **Structure Assumptions**
Assume a new structure every 1,100 feet
Assume 0.23 construction acre disturbances for each structure, based on a 100- by 100-foot construction area
Assume 0.01 long-term acre disturbances for each structure, based on a 10- by 10-foot structure footprint rounded up

[b] Access Road Assumptions
Assume no disturbance for Segment 3 access roads because they are in existing Right-of-Way (ROW)
Assume access roads parallel to transmission lines for Segments 1, 2A1, 2A2, 2A3, 2A4, 2A5, and 2B
Assume 6.3 miles of new access road for 2C portion (9.4 miles is along existing ROW)
Assume 15-foot width for access roads
Assume road disturbance acres for long- and short-term = miles*5280*15'width\43,560

[c] **Assume a pulling site every 3 miles and short-term disturbance of 0.4 acre per site**
[d] **Assume materials storage yard every 15 miles and short-term disturbance of 5 acres per site**
[e] **East alignment would parallel the east side of Highway 99**
[f] **West alignment would parallel the west side of Highway 99**

ES.6.6 Alternative B

Alternative B includes Segments 1, 2B, and 3. It would construct about 31.3 miles of new double-circuit, 230-kV transmission line on about 150 structures and would require up to 48.2 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission line.

ES.6.7 Alternative C

Alternative C includes Segments 1, $2C_1$, $2C_2$, and 3. It would construct about 37.6 miles of new double-circuit, 230-kV transmission line on about 180 structures and would require up to 42.5 acres of access roads. Alternative C would abandon about 8.6 miles of existing Cottonwood-Roseville transmission line. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission line.

ES.6.8 No Action

The No Action Alternative would include operation and maintenance of the existing transmission lines. Western would not build any of the new transmission line segments presented in Section ES.5. Implementing this alternative would preclude most short-term environmental impacts associated with construction activities. This alternative would not meet the proposed Project's Purpose and Need. The No Action Alternative would not alleviate the greater Sacramento Area power system voltage stability, reliability, and security problems. While Western and interconnected transmission system owners, Load Serving Entities, and area utilities would continue to take appropriate measures to manage power system reliability they may be unable to meet system reliability standards and contractual obligations under the No Action Alternative.

ES.7 PROJECT SCOPE OF WORK

The proposed Project Scope of Work would include:

- Excavation and construction of reinforced concrete foundations and structure erection for approximately 150 to 180 new monopole structures.
- Installation of overhead conductor (wire) and fiber optic cables supported on the proposed structures.
- Removal of about 4.8 miles of existing SMUD 230-kV/115-kV transmission line.
- Construction of temporary and permanent access roads for removal of existing facilities, construction of new facilities, and future operation and maintenance of the proposed Project
- Modifications within Western's existing O'Banion Substation and SMUD's existing Elverta and Natomas substations.
- Site restoration of areas disturbed temporarily by construction activities.

ES.8 DIRECT AND INDIRECT ENVIRONMENTAL IMPACTS

The proposed Project would consist of about 31 to 38 miles of new construction on new and existing ROWs. The proposed Project would impact about 99 to 110 acres of land during construction and permanently impact about 44 to 58 acres of land for the operation and maintenance of the Project.

Western and SMUD have adopted a proactive stance by incorporating Environmental Protection Measures (EPMs) into this SEIS/EIR and the proposed Project to minimize the potential for significant impacts on the environment (See Section 3.5 and Table 3.3). The proposed EPMs are standards that can feasibly be incorporated to reduce potential environmental impacts.

A comparison of the impacts associated with each alternative is presented in Table ES-2 and Table B-1 in Appendix B. After consideration of the proposed Project EPMs, Western has determined that except for Alternative C, Segment $2C_2$ there is little variation in impacts among alternatives. Alternative C, Segment $2C_2$ would conflict with the City of Roseville's visual resource policy and, therefore, result in a significant impact on visual resources

The proposed Project alternatives would similarly impact air resources, biological resources, land use, water resources, and wetlands during construction and permanently impact biological resources, land use, visual resources, and wetlands. The direct and indirect impact to these resources would be less than significant for each alternative except Alternative C, as noted above.

In addition to the proposed EPMs, mitigation measures may be proposed during the public comment period to further reduce potential impacts.

Table ES-2. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Air Quality									
Air emission standards[a]	Short-term construction and maintenance emissions exceed PM_{10}, NO_x, or VOC Air District thresholds	Short-term NO_x emissions would exceed district thresholds[a]							No
Biological Resources[b,c,d]									
Giant Garter Snake Habitat	Effects on giant garter snakes in rice field complexes, freshwater emergent wetlands, and water bodies	ROW would cross 270-283 acres of rice fields	ROW would cross 261-275 acres of rice fields	ROW would cross 281-292 acres of rice fields	ROW would cross 272-277 acres of rice fields	ROW would cross 280-297 acres of rice fields	ROW would cross 163 acres of rice fields	ROW would cross 236 acres of rice fields	No
Vernal Pool Habitat	Effects on vernal pool habitat	ROW would cross 4.0 acres of vernal pools	ROW would cross 4.0 acres of vernal pools	ROW would cross 9.2 acres of vernal pools	ROW would cross 3.4 acres of vernal pools	ROW would cross 3.7 acres of vernal pools	ROW would cross 11.1 acres of vernal pools	ROW would cross 11.8 acres of vernal pools	No
Designated critical habitat for Central Valley Steelhead and/or Chinook Salmon	Effects on Central Valley Steelhead and/or Chinook Salmon	Potential effects on Central Valley Steelhead and Chinook Salmon							No
Sensitive species	Permanent loss of habitat for sensitive species	Sensitive species habitat would be permanently removed							No
Cultural Resources[c]									
Prehistoric cultural resources, historic cultural resources, and TCPs	Impacts to eligible cultural resources or TCPs	No[c]							No

Table ES-2. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Electric and Magnetic Fields[c]									
Corona, field, and health effect	Exposure to EMF	No[c]							NA
Environmental Justice[c]									
Low-income, minority, or subsistence populations in the project area are disproportionately affected	Disproportionate adverse impacts	No[c]							No
Floodplains[c,f]									
Obstructs, decreased capacity to convey flows, destabilization of soils, alter or impair ability of floodplains to convey flows	Increased susceptibility to flooding	No[c,f]							No
Geology[c]									
Subsidence, landslides, or seismic hazards	Erosion, subsidence, landslides, and seismic hazards	No[c]							No
Health and Safety[c]									
Hazardous materials/ waste, electrical hazards, and fall hazards	Mishandling hazardous materials, waste, herbicides, electrical contact, and worker falls	No[c]							No

Table ES-2. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Land Use[c]									
Proximity of new ROW of transmission lines to residences, loss of prime farmland, effects on recreation and open space, and impacts to traffic patterns during construction	Disturbances from construction or operation	Short-term construction impacts[c]							No
	Conflict with approved and/or adopted land use plans Loss of prime and unique farmland	No conflict with existing land use plans. 26 acres of prime farmland would be removed	No conflict with existing land use plans. 22 acres of prime farmland would be removed	No conflict with existing land use plans. 32 acres of prime farmland would be removed	No conflict with existing land use plans. 35 acres of prime farmland would be removed	No conflict with existing land use plans. 30 acres of prime farmland would be removed	No conflict with existing land use plans. 18 acres of prime farmland would be removed	No conflict with existing land use plans. 22 acres of prime farmland would be removed	No
Noise[c]									
Noise average day-night noise levels (L_{dn})	Noise from construction and operation	No[c]							No
Paleontological Resources[c]									
Destruction of significant fossils	Loss of, or inaccessibility to, scientifically important paleontological resources	No[c]							No

Table ES-2. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Socioeconomics[c]									
Displace existing residences or businesses or physically divide a community Degradation or over-commitment of existing goods and services to an extent that would limit the sustainability of existing communities	**Short-term effects:** Disrupting businesses and affecting income and employment	Short-term increased employment in the study area							No
	Long-term effects: Loss of farmland and planned development	Loss of up to 26 acres farmland and 202 acres of development	Loss of up to 27 acres farmland and 206 acres of development	Loss of up to 32 acres farmland and 205 acres of development	Loss of up to 35 acres farmland and 224 acres of development	Loss of up to 30 acres farmland and 202 acres of development	Loss of up to 18 acres farmland and 78 acres of development	Loss of up to 22 acres farmland and 99 acres of development	
Soils[c]									
Erosion, improper drainage, high water erodibility, steep slopes, and compaction	Loss of top soil, steep slopes, and increase in soil compaction.	No[c]							No
Traffic[c]									
Increase traffic load and capacity of street system, change of traffic patterns, conflict with alternative transportation programs, cause traffic delays, and cause physical harm to roads that is not repaired.	**Short-term effects:** Traffic delays during construction No significant long-term effects	If construction of Segments 2A1 to 2A5 is on the east side, the alignment would cross Highway 99 once near Catlett Road. If construction of these segments is on the west side, the alignment would cross Highway 99 three times; once at Catlett Road, Cross Canal, and the point corresponding with the eastward selection[c]					No[c]	No[c]	No

Table ES-2. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Visual Resources[c]									
Altering existing landscapes, effects to areas of high visual quality or scenic landscapes, and consistency with local and county general plans	**Long-term effects:** Transmission lines constructed along areas with no scenic views or adjacent to existing lines	No[c]	No[c]	No[c]	No[c]	No[c]	No[c]	Alternative C, Segment $2C_2$ would conflict with the City of Roseville's visual resource policy and result in significant indirect and cumulative impacts.	No
Water Resources[c,e]									
Erosion, compaction, and sedimentation or blockage of drainage; introduction of debris, fill, or contamination into surface water or groundwater; damage to irrigation improvements; and depletion of water resources	Sedimentation from construction disturbance, blocked drainage, contaminants reaching surface water or groundwater, damage to irrigation improvements, and depleted water resources.	Western would obtain permits to comply with applicable environmental laws, regulations, and the statewide Construction Storm Water General NPDES Permit, and other applicable permit requirements.[c,e]							No

Table ES-2. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Wetlands[b,c,e]									
Degradation of biological values and wetland functions from excavation, fill, disturbance, or sedimentation; and increased access by humans or invasive species	Short-term effects from construction within wetlands Long-term effects from structures sited in wetlands, vernal pools, and other Waters of the United States	4 structures may be sited in wetland areas[b,e]	4 structures may be sited in wetland areas[b,e]	6 structures may be sited in wetland areas[b,e]	4 structures may be sited in wetland areas[b,e]	4 structures may be sited in wetland areas[b,e]	10 structures may be sited in wetland areas[b,e]	7 structures may be sited in wetland areas[b,e]	No

Source: Burleson 2007

[a] Western would implement EPMs in accordance with air district requirements to minimize impacts.

[b] Western would coordinate with USFWS as part of their Section 7 consultation and CDFG.

[c] Western would adhere to EPMs to minimize impacts.

[d] Western would coordinate removal of elderberry bushes with USFWS.

[e] The proposed Project would span surface water and riparian habitat and avoid wetlands; however, if they could not be spanned or avoided, Western would coordinate with USACE, RWQCB, NOAA Fisheries, and USFWS.

[f] Construction in floodplains may require Western to coordinate with USACE, RWQCB, and/or the California Reclamation Board.

CDFG = California Department of Fish and Game

EPM = Environmental Protection Measure

NA = Not Applicable

NO_x = Nitrogen oxides

PM_{10} = Particulate matter less than or equal to 10 microns in diameter

ROD = Record of Decision

ROW = Right-of-Way

RWQCB = Regional Water Quality Control Board

TCP = Traditional cultural property

USACE = U.S. Army Corps of Engineers

USFWS = U.S. Fish and Wildlife Service

VOC = volatile organic compounds

Western = Western Area Power Administration

If the proposed mitigation measures are determined by Western to be feasible, these measures would be included in the Final SEIS/EIR and would become part of the proposed Project.

Western would also consult with Federal, state and local agencies to review the proposed Project's impact on sensitive habitat prior to beginning construction activities. Agencies may require additional mitigation to reduce potential impacts even further. These mitigation measures will also become part of the proposed Project as required by each agency.

ES.9 CUMULATIVE IMPACTS

Cumulative impacts result from the incremental effect of the proposed Project when added to other past, present, and reasonably foreseeable future actions. Requirements for addressing cumulative impacts are to gather and analyze enough data to make a reasoned decision concerning these impacts. Western and SMUD examined actions that may have potential environmental impacts on the same resources affected by this proposed Project and other projects in the study area. A list of reasonably foreseeable projects is presented in Chapter 5. Reasonably foreseeable future projects in the study area include commercial and residential developments that would result in a substantial conversion of farmland and sensitive areas to urban uses.

Western has determined that except for Alternative C, Segment $2C_2$ there is little variation in cumulative impacts among alternatives. Cumulative impacts would vary little among alternatives, except Alternative C and are most prominent for air, biological, land use, water, and wetland resources because they are already stressed in the study area. Implementation of the proposed Project EPMs and mitigation measures provided by Federal, state, and local agencies would reduce cumulative impacts to less than significant. Alternative C, Segment $2C_2$ would have a cumulative significant impact on visual resources because of its direct and indirect effects as it would conflict with the City of Roseville's visual resource policy.

ES.10 MITIGATION MONITORING REPORT PLAN

EPMs and mitigation measures would be used to lessen or avoid the effect of the proposed Project on the environment. These EPMs and any additional mitigation measures developed in consultation with Tribes or agencies with jurisdiction or feasible measures identified through public comment would be included in the Project Mitigation Monitoring Report Plan (see Appendix E) to ensure EPMs and mitigation measures are implemented.

ES.11 GROWTH INDUCEMENT

The proposed Project would not remove obstacles to growth. SMUD does not have land use authority. These decisions are made by local city and county jurisdictions regardless of the presence or absence of electrical infrastructure. Both SMUD and Roseville are required by law to provide electric service. Therefore, local jurisdictions, property owners, and developers assume that electric service would be provided regardless of where the development occurs.

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ACRONYMS

AAQS	Ambient Air Quality Standards
AIRFA	American Indian Religious Freedom Act
AM	amplitude modulation
APE	Area of Potential Effects
ARPA	Archaeological Resources Protection Act
CalTrans	California Department of Transportation
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CDC	California Department of Conservation
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CPUC	California Public Utilities Commission
CVP	Central Valley Project
CWA	Clean Water Act
DNA	deoxyribonucleic acid
DHS	California Department of Health Services
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DWR	California Department of Water Resources
EDD	California Employment Development Department
EFH	Essential Fish Habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJ	Environmental Justice
ELF	extremely-low-frequency
EMF	electric and magnetic field
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPM	Environmental Protection Measure
EPRI	Electric Power Research Institute
ESA	Endangered Species Act
ESU	Evolutionary Significant Unit
FEMA	Federal Emergency Management Agency
FM	frequency modulation
FMMP	Farmland Monitoring and Mapping Program
FR	Federal Register
FRAQMD	Feather River Air Quality Management District
GIS	geographic information system
GSA	Greater Sacramento Area
HCP	Habitat Conservation Plan
ICNIRP	International Commission on Non-Ionizing Radiation Protection
LOS	Level of Service
MAP	Mitigation Action Plan
MMI	Modified Mercalli Intensity
MMRP	Mitigation Monitoring Report Plan

MP	milepost
MSA	Magnuson-Stevens Fisheries Conservation and Management Act
NA	not available/not applicable
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NBHCP	Natomas Basin Habitat Conservation Plan
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Council
NESC	National Electric Safety Code
NHPA	National Historic Preservation Act
NIEHS	National Institute of Environmental Health Sciences
NMFS	National Marine Fisheries Service
NO_2	nitrogen dioxide
NOA	notice of availability
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NRPB	National Radiological Protection Board
O_3	ozone
OSHA	Occupational Safety and Health Administration
PCAPCD	Placer County Air Pollution Control District
PCCP	Placer County Conservation Plan
PGA	peak ground acceleration
PRC	Public Resources Code
PSMM	Power System Maintenance Manual
PSOM	Power System Operations Manual
PSSM	Power System Safety Manual
Qb	Floodbasin deposits
Qr	River deposits
QTc	Continental deposits
RAPID	Research and Public Information Dissemination
Reclamation	U.S. Bureau of Reclamation
ROD	record of decision
ROG	reactive organic gas
Roseville	City of Roseville
ROW	right-of-way
RT	Sacramento Regional Transit
RWQCB	Regional Water Quality Control Board
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SMAQMD	Sacramento Metropolitan Air Quality Management District
SMUD	Sacramento Municipal Utility District
SNR	Sierra Nevada Region/Sierra Nevada Regional Office
SO_2	sulfur dioxide
SR	State Route
SVP	Society of Vertebrate Paleontology
SVS	Sacramento Area Voltage Support
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TCP	traditional cultural property
TNBC	The Natomas Basin Conservancy
U.S.	United States

U.S.C.	United States Code
UBC	Uniform Building Code
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
WECC	Western Electricity Coordination Council
Western/WAPA	Western Area Power Administration
WRSP	West Roseville Specific Plan

UNITS OF MEASURE

%	percent
°F	Fahrenheit
µg/m3	micrograms per cubic meter
µT	microteslas
cm	centimeters
cm/sec	centimeters per second
dB	decibel
dBA	decibel, A-weighted sound levels
G	gauss
GHz	gigahertz
kV	kilovolt
lb/day	pounds per day
Ldn	average day to night noise level
Leq(24)	24-hour average noise
m	meter
mG	miligauss
PM_{10}	particulate matter equal to or less than 10 microns in diameter
$PM_{2.5}$	particulate matter equal to or less than 2.5 microns in diameter
ppb	parts per billion
ppm	parts per million
V	volt
V/C	volume to capacity

CHAPTER 1
Introduction

1.1 BACKGROUND

The Western Area Power Administration (Western) delivers reliable, cost-based hydroelectric power and related services within the central and western United States (U.S.). Western is one of four power marketing administrations within the U.S. Department of Energy (DOE), whose role is to market and transmit electricity from multi-use Federal water projects. Western markets energy from power plants operated by the U.S. Bureau of Reclamation (Reclamation), U.S. Army Corps of Engineers (USACE), and the International Boundary and Water Commission.

Western's service area covers 1.3 million square miles, and its wholesale power customers provide service to millions of consumers in 15 western states. Western operates and maintains about 17,000 miles of transmission lines from its four regional offices. The greater Sacramento, California, area is within Western's Sierra Nevada Region (SNR).

SNR maintains and operates numerous substations and more than 1,200 miles of transmission lines. These transmission lines are interconnected to other greater Sacramento-area utility transmission lines, including those owned and operated by the Sacramento Municipal Utility District (SMUD). By law, Western markets power that is in excess of Federal project requirements to preference customers, such as Federal and state agencies, Native American Tribes, electric cooperatives, municipal utilities, public utility districts, irrigation districts, and water districts. Western sells wholesale electricity to more than 70 customers in central and northern California and Nevada from the Central Valley Project (CVP) and the Washoe Project.

SMUD is one of the greater Sacramento-area transmission system owners, a Load Serving Entity, and an area electric utility that serves approximately 565,000 electric customers in Sacramento County and small portions of Placer and Yolo counties. SMUD is the "Balancing Authority" for some of the greater Sacramento-area utilities and transmission system owners including Western and the City of Roseville (Roseville). Roseville, a municipal utility, is also a Load Serving Entity and electric utility that serves approximately 50,000 electric customers in Placer County.

Western, in collaboration with Sacramento-area transmission system owners and utilities completed transmission system studies in 2001-2002. The studies identified a need for system enhancements in the greater Sacramento-area that are needed to maintain the Sacramento-area transmission system and the interconnected Western transmission system voltage stability, security, and reliability. Western prepared a Draft Environmental Impact Statement (EIS) in November 2002 (Western 2002a) and a Final EIS in September 2003 (Western 2003). A Record of Decision (ROD) was signed on January 12, 2004. The ROD was based upon the analysis in the EIS. It concluded that if a project were to proceed, it should follow the configuration of the preferred alternative described in the Final EIS. This alternative was identified as Alternative 2 Option B and included the following:

1. Reconductoring the existing double circuit 230-kV transmission line from Elverta Substation to Tracy Substation.
2. Constructing a new double-circuit 230-kV transmission line from O'Banion Substation to Elverta Substation.
3. Realignment of the transmission line near Pleasant Grove Cemetery between O'Banion Substation and Elverta Substation and Option B of the Cottonwood-Roseville single circuit, 230-kV transmission line.

In 2005, SMUD and Roseville agreed to provide funding and Western decided to proceed with additional environmental review of the project. Since the completion of the original system studies, the greater Sacramento-area transmission system has gone through significant changes. These changes include construction of new power plants, cancellation or indefinite delay of proposed power plants and increase in the amount of power imported into the greater Sacramento area. The system studies performed in 2006 and 2007 continue to show that the existing transmission lines have reached their maximum power transfer limits for serving the area's energy needs. Transmission line additions and upgrades are still necessary to maintain system voltage stability, reliability, and security of the

greater Sacramento-area transmission system, including Western's interconnected transmission system. Area utilities and Load Serving Entities have taken interim measures to avoid potential uncontrolled system-wide outages. However, these measures are only temporary solutions. If used during summer peak periods, these solutions can negatively impact the reliability and security of the greater Sacramento-area transmission system and Western's interconnected system. Based upon the results of these studies Western and area transmission system owners and utilities recommend adding transmission system improvements. These improvements would provide a higher level of voltage support, security, and reliability than the preferred alternative recommended in the FEIS. The proposed Project consists of the following components and is shown in Figure 1.1-1:

1. Constructing a new, double-circuit, 230-kV transmission line between O'Banion Substation and the area just south of the Elverta Substation. This transmission line would include a new circuit from O'Banion Substation to Elverta Substation and a new circuit from O'Banion Substation to Natomas Substation.
2. Reconstructing the existing double-circuit 230-kV/115-kV transmission line between Elverta Substation and Natomas Substation into a double-circuit 230-kV transmission line.

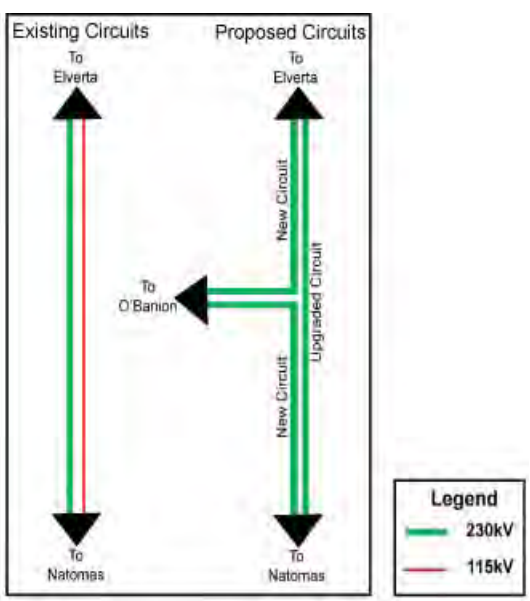


Figure 1.1-1
Conceptual Electrical Schematic

As a Federal agency, Western has responsibility to prepare this SVS Supplemental EIS (SEIS) according to the National Environmental Policy Act (NEPA) (42 U.S.C. §§ 4321-4370, as amended) The SEIS will analyze environmental impacts from the construction and operation of the proposed Project. The proposed Project includes transmission facilities currently owned and operated by SMUD which obtains its authority from the State of California's Municipal Utility District Act. As a project participant, SMUD has responsibility under the California Environmental Quality Act (CEQA) to prepare an Environmental Impact Report (EIR). While Western is not subject to CEQA, Western and SMUD, with Roseville's participation, have prepared this joint Supplemental SVS SEIS and EIR as a stand-alone document to minimize the need for extensive cross-referencing to the original EIS. Its purpose is to analyze the environmental impacts from constructing and operating the proposed Project. Draft SEIS and EIR findings will provide Western and participating agencies with a basis for making a decision on whether the proposed Project should proceed and if so, under which alternative. Western would implement appropriate solutions under its Reclamation Law authority.

Western has prepared this Draft SEIS in compliance with Federal laws, regulations and guidelines and SMUD has prepared this EIR in compliance with state laws, regulations and guidelines. These include NEPA, CEQA, the Council on Environmental Quality (CEQ), Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), the DOE NEPA Implementing Procedures (10 CFR Part 1021), and other applicable regulations.

1.2 PUBLIC INVOLVEMENT

Public involvement is a vital part of the decision-making process for this Draft SEIS and EIR. Western and SMUD developed a public involvement program to provide multiple opportunities for comment during the Draft SEIS and EIR process of public scoping, alternative formulation, alternative evaluation, and decisionmaking. The program is intended to guide Western and SMUD through a collaborative, systematic, decision-making process to heighten public awareness and to encourage open communication throughout the development of the

The Electrical Power System

Electrical power systems consist of four primary elements: generation, transmission, distribution, and load. Generators convert fuel (for example, water, natural gas, nuclear, wind, sun, or coal) into electricity. The transmission system carries the electricity from generators to distribution systems, using high-voltage transmission lines. Transmission systems comprise a complex network across several neighboring states, which allow generators to serve loads hundreds of miles away. Distribution systems deliver electricity to retail customers. The system load is the sum of all power-consuming devices (such as household appliances, lights, air conditioners, industrial loads, etc.) plus system losses. Figure 1.1-2 illustrates a typical electric power system.

Voltage

Voltage is the force that causes charged particles to move. The operation of a transmission line is similar to the flow of water through a hose. A generator develops voltage to put into the transmission line similar to the way a water pump develops water pressure to put into the hose. Voltage, like water pressure, is a force. The transmission line or hose serves as the conduit for delivery of the resource to the user. The size of the transmission line conductor (wire) or the hose is the limiting factor in the delivery system, regardless of the force applied. The length of the transmission line may also affect the amount of electricity that can flow through it. Electrical losses in a transmission line occur because some of the electricity's energy escapes in the form of heat. Longer transmission lines will generally have more losses. Likewise, the water pressure at the end of the garden hose would be considerably less than the pressure directly at the faucet.

Load

Load is the amount of electric power delivered or required at any specified point or points on a system. Load primarily originates at the energy-consuming equipment of the customers (for example, lights, heating and cooling systems, and electrical devices).

Voltage Support

Voltage is influenced by load. As load increases, voltage tends to decrease. When load exceeds transmission capacity, voltage stability and transmission system reliability are negatively impacted. Short-term voltage support solutions include increasing existing generation output, installing capacitors, and adjusting transformer taps. As a last resort, in order to avoid system-wide voltage collapse and to maintain transmission system reliability, operators may be required to implement post contingency load shedding and/or rotating blackouts. However these solutions provide limited voltage stability improvement and are not always available or preferred. In addition, load shedding or rotating blackouts can have a significant negative impact on utility customers. Permanent voltage stability generally requires transmission line additions or upgrades to the existing area transmission system.

Transmission System Security and Reliability

Security refers to the ability of the electric system to withstand sudden disturbances, such as electric short circuits, or unanticipated loss of system elements such as a substation. Reliability is the assessment of the frequency, duration, and magnitude of interruptions for a given power system.

Balancing Authority

A Balancing Authority is responsible for balancing resources such as generation and energy imports with load including operating reserves and managing the transmission system within the authority's boundaries in accordance with strict reliability standards established by the North American Electric Reliability Council (NERC) Reliability Standards and the Western Electricity Coordination Council (WECC). Balancing Authorities exist throughout the nation's interconnected transmission system and they work cooperatively with each other. SMUD is one of five Balancing Authorities in California.

Load Serving Entity

A Load Serving Entity secures energy and transmission service and related Interconnection Operations Services to serve the electrical demand and energy requirements of its end-use customers.

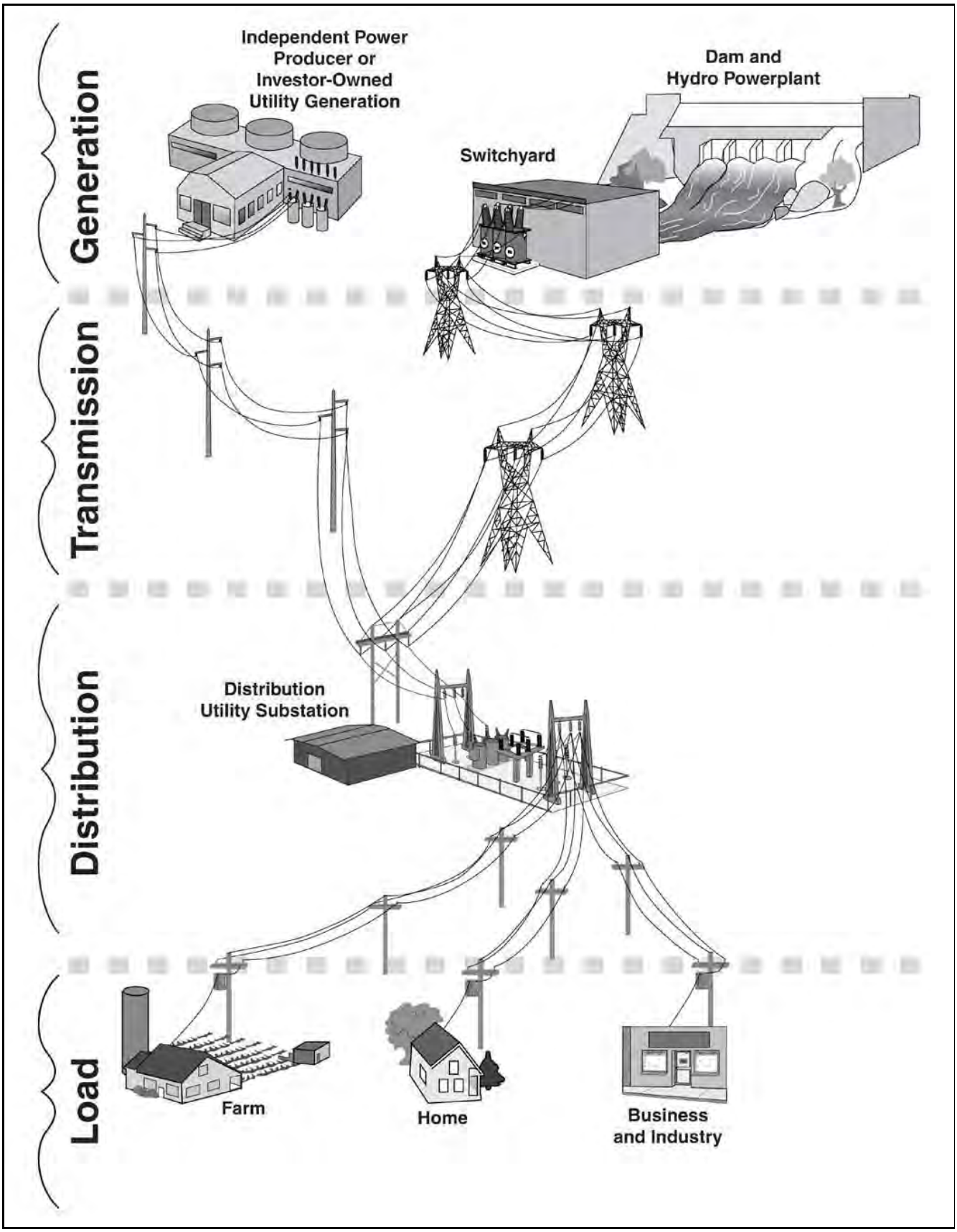


Figure 1.1-2. Diagram of a Typical Electric Power System

Draft SEIS and EIR. The process was designed for flexibility and responsiveness to the issues and needs of the public, Western's customers, and public agencies. Following is Western's anticipated schedule:

Public Scoping	May 9-July 15, 2006
Public Scoping Meetings	June 5 and 7, 2006
Release of Draft SEIS and EIR	July 2007
Public Comment Forum	August 2007
Public Comment Period Closes	45 days from Notice of Availability of Draft SEIS and EIR
Release of Final SEIS and EIR	Winter 2007/Spring 2008

CHAPTER 2
Purpose and Need

2.1 PURPOSE AND NEED FOR THE PROJECT

Western's transmission system is part of the interconnected transmission system of the greater Sacramento area. The transmission system involves other transmission system owners, Load Serving Entities, and utilities, including SMUD and Roseville. Western's system contributes to and is affected by voltage stability, reliability, and security of the greater Sacramento-area transmission system. Western must meet its contractual obligations to customers for delivering power generated from Federal hydroelectric facilities.

Western regularly participates in transmission system studies with other greater Sacramento-area transmission system owners, Load Serving Entities, and utilities to address transmission system needs. In 2001 and 2002, these studies concluded that the system's existing transmission lines were reaching their maximum power transfer limits for serving the area's existing energy needs; therefore, transmission system additions and upgrades were necessary to maintain required power system voltage stability, reliability, and security. Without transmission system additions and upgrades, North American Electric Reliability Council (NERC) Reliability violations could occur. Western and the interconnected transmission system owners, area Load Serving Entities, and area utilities are required to ensure that the system is operated in accordance with strict reliability standards established by the NERC and the Western Electricity Coordination Council (WECC).

Since the completion of the original transmission studies, the greater Sacramento-area transmission system has gone through significant changes. These changes include the construction of new power plants, the cancellation or indefinite delay of proposed power plants, and the increase in the amount of power imported to the greater Sacramento area. The transmission system studies performed in 2006 and 2007 continue to show that the existing transmission lines in the greater Sacramento area have reached their maximum power transfer limits for serving the area's energy needs, particularly in the northern portion of the greater Sacramento area. Load Serving Entities and utilities in the area have taken interim measures to avoid potential uncontrolled system-wide outages. As a last resort, operators may be required to implement post-contingency load shedding and/or rotating blackouts. These measures provide limited voltage stability improvement and are not always available or preferred. In addition, load shedding or rotating blackouts can have a significant negative impact on utility customers.

Therefore, Western, greater Sacramento-area transmission system owners, Load Serving Entities, and utilities need transmission system additions and upgrades to maintain Western's, and the greater Sacramento-area transmission system voltage stability, reliability, and security in accordance with NERC and WECC Planning/Operations Reliability Standards and continue meeting Western's legislative and contractual requirements. The resulting system additions and upgrades would also provide additional power importing capabilities to the greater Sacramento area.

CHAPTER 3
Alternatives

This chapter describes the proposed Project and the Project alternatives. It presents descriptions of activities associated with each alternative, identifies Environmental Protection Measures (EPM) and provides an impact summary comparing the alternatives analyzed. A preferred alternative for the proposed Project is unknown at this time. Western and SMUD will consider public comments to the Draft SEIS and EIR to make a decision on the preferred alternative. The preferred alternative and the environmentally preferred alternative will be identified in the Final SEIS and EIR.

3.1 PROPOSED PROJECT

The following comprises Western's proposed Project:

1. Constructing a new, double-circuit, 230-kV transmission line between O'Banion Substation and the area just south of the Elverta Substation. This transmission line would include a new circuit from O'Banion Substation to Elverta Substation and a new circuit from O'Banion Substation to Natomas Substation.
2. Reconstructing the existing double-circuit 230-kV/115-kV transmission line between Elverta Substation and Natomas Substation into a double-circuit 230-kV transmission line.

A conceptual electrical diagram is presented in Figure 3.1-1.

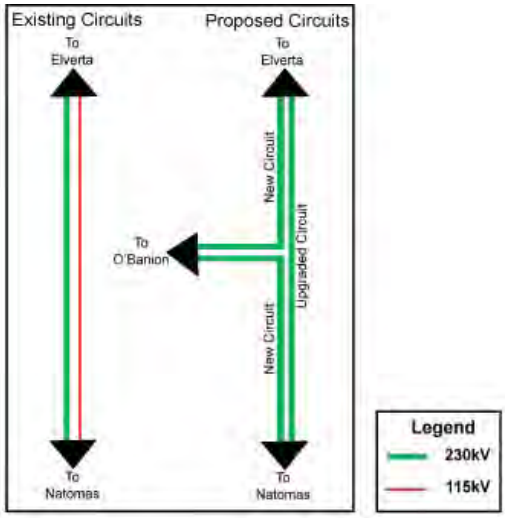


Figure 3.1-1
Conceptual Electrical Schematic

3.2 ROUTE SEGMENT DESCRIPTIONS

The proposed Project would be constructed using three route segments. Figures 3.1-2 and 3.1-3 present the general layout of Route Segments 1, 2, and 3. Segments 1 and 3 are common to each alternative. Segment 1 is identical to Segment A_1 of the previous EIS and ROD to the point where it ends at Cross Canal, north of Howsley Road. Segment 3 encompasses the first 4.8 miles of Segment C from the previous EIS and ROD, with the provision that every structure would be replaced, as well as conductors. Segment 3 would consist of two circuits on a single transmission line in existing ROW. Segment 2 has several route options, of which one (Segment 2C) comprises the southern 5 miles of Segment A_1 and Segments B, F, G, H, I, and J from the previous EIS and ROD (identified as Option B). The remaining Segment 2 route options are newly developed with this Draft SEIS and EIR.

This SVS SEIS and EIR analyzes Segments 1 and 3 for air, biological, and cultural resources to satisfy commitments made in the original ROD. A comparative analysis of alternatives will include Segments 1 and 3 for each of the Segment 2 route options. Segment 2C was previously analyzed for all resources, but will be presented in this Draft SEIS and EIR for comparison of alternatives for Segment 2.

Seven potential alternative alignments were identified for Segment 2 that would connect Segment 1 to Segment 3. Segment 2 would tie into Segment 3 just south of Elverta Substation, with the specific location depending on which alternative is selected.

Figures 3.1-4 through 3.1-12 present route segments, with each segment divided into approximate 1-mile sections marked by numeric mileposts (MP), each segment beginning with MP 0.0. Table B-1 in Appendix B provides a summary of the segments with construction and long-term disturbances associated with specific operations. Appendix C contains aerial photographs of the line segments and mileposts. Segments are described in the following sections.

3.2.1 Segment 1 – O'Banion Substation to Cross Canal

Segment 1 would consist of constructing about 17.1 miles of new double-circuit, 230-kV transmission line in new transmission line right-of-way (ROW) and adjacent to an existing transmission line ROW from O'Banion Substation to an area near Cross Canal (see Figure 3.1-4). It would parallel the Sutter Bypass and cross the Feather River. Western does not anticipate the need to construct new access roads.

3.2.2 Segment 2 – Cross Canal to South of Elverta Substation

Several alignments were originally considered for Segment 2. Preliminary screening was based primarily on which side of the road a segment should follow. As a result, four segments were eliminated from consideration in the Draft SEIS and EIR, primarily because of engineering constraints, as described in Appendix A. Three alignments were retained for Segment 2, including Segments 2A, 2B, and 2C. Segment 2A was further delineated into route Segments 2A1, 2A2, 2A3, 2A4, and 2A5 to evaluate various west-to-east routes between Highway 99 and points near East Levee Road. Segment 2 routes are described below.

Segment 2A would consist of constructing about 11.6 to 13.5 miles of new double-circuit, 230-kV transmission line within a new ROW. This alignment would begin at the termination of Segment 1 and proceed about 0.7 mile along Cross Canal, then turn south along the east or west side of Highway 99. Segments 2A1, 2A2, 2A3, 2A4, and 2A5 present five alternative routes between Riego Road and Elkhorn Boulevard that connect the east or west Highway 99 route option east to a point near East Levee Road, then extend south and east to connect with SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation in Sacramento County. Segments 2A1, 2A2, 2A3, 2A4, and 2A5 are further described below and shown in Figures 3.1-4 to 3.1-9. Each new 2A alignment would require new access roads.

3.2.2.1 Segment 2A1 – South Side of Riego Road

Segment 2A1 would proceed south along the east or west side of Highway 99 for about 5.1 miles to Riego Road. The alignment would proceed east along the south side of Riego Road for about 2.4 miles, then turn south along the west side of East Levee Road for about 3.5 miles to intercept SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation.

3.2.2.2 Segment 2A2 – North Side of Sutter County Line

Segment 2A2 would proceed south along the east or west side of Highway 99 for about 6.1 miles to the Sacramento/Sutter County Line. The alignment would proceed east along the north side of the county line in Sutter County for about 2.5 miles and then turn south along the west side of East Levee Road for about 2.3 miles to intercept SMUD's existing Elverta-Natomas transmission line south of Elverta Substation.

3.2.2.3 Segment 2A3 – North Side of Elverta Road

Segment 2A3 would proceed south along the east or west side of Highway 99 for about 7.7 miles to West Elverta Road. The alignment would proceed east on the north side of Elverta Road for about 2.4 miles, and then turn south for about 0.8 mile and east for 0.3 mile to the west side of East Levee Road to intercept SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation.

3.2.2.4 Segment 2A4 – North Side of Elkhorn Boulevard

Segment 2A4 would proceed south along the east or west side of Highway 99 for about 9.8 miles to West Elkhorn Boulevard. The alignment would then proceed east along the north side of Elkhorn Boulevard for about 2.8 miles to the west side of East Levee Road, where it would intercept SMUD's existing Elverta-Natomas transmission line about 2.2 miles south of the Elverta Substation.

3.2.2.5 Segment 2A5 – Community Separator

Segment 2A5 would proceed south along the east or west side of Highway 99 for about 7.1 miles to a Community Separator[1] planned by the City of Sacramento north of Elverta Road. The alignment would proceed east along the Community Separator for about 2.8 miles, and then turn south along the west side of East Levee Road for about 1.2 miles to intercept SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation.

3.2.2.6 Segment 2B – Cross Canal to Elverta Substation – Abandoned Railroad Right-of-Way Alignment

Segment 2B would require new ROW, which would follow the alignment of an abandoned railroad ROW from the termination of Segment 1 and proceed southeast to an area north of Rio Linda Boulevard. From there, it would proceed southwest within an existing transmission line ROW, around the west side of the existing Elverta Substation, and tie into SMUD's existing Elverta-Natomas transmission line south of the Elverta Substation. Small areas near Rio Linda Boulevard and Elverta Road also would require new transmission line easements.

3.2.2.7 Segment 2C – Cross Canal to Elverta Substation – Eastern Alignment

Segment 2C consists of Segments $2C_1$ and $2C_2$. Segment $2C_1$ would consist of constructing about 9.4 miles of new double-circuit, 230-kV transmission line from the termination of Segment 1 near Cross Canal to an area near the Elverta Substation. Segment $2C_1$ would angle east from the existing transmission line to avoid houses then cross the line at about MP 0.5 to avoid the Pleasant Grove Cemetery near Howsley Road. Segment $2C_1$ would then cross the existing transmission line at about MP 1.3 to avoid a farmer's house and cross back at about MP 2.2 to avoid a barn near Fifield Road. Segment $2C_1$ would again cross the existing transmission line at MP 3.0 to avoid structures and to use the existing Cottonwood-Roseville ROW from MP 5.1 to 8.0. The line would then continue south to tie into the Elverta-Natomas transmission line near the Elverta Substation. Small areas around Elverta Road would require new transmission line easements.

Segment $2C_2$ would be constructed to reroute the existing Cottonwood-Roseville 230-kV transmission line to the east to provide sufficient ROW for Segment $2C_1$ between MP 5.1 and 8.0. This reroute would originate at Structure 143/3 and proceed east with construction of new 230-kV transmission line for about 3.9 miles, then south for about 2.4 miles to rejoin the existing Cottonwood-Roseville transmission line between Structures 152/2 and 152/3. About 8.7 miles of existing Cottonwood-Roseville line would be abandoned from Keys Road to Sorento Road (Segment $2C_1$ MP 8.0) then northeast to the termination of Segment $2C_2$. Cottonwood-Roseville structures from Keys Road to just north of Jackson Road and from Segment $2C_1$ MP 8.0 to the termination of Segment $2C_2$ would be left in place and the conductors would be removed. Cottonwood-Roseville structures between MP 5.1 (Jackson Road) and Segment $2C_1$ MP 8.0 would be removed to provide ROW for Segment $2C_1$.

3.2.3 Segment 3 – Elverta Substation to Natomas Substation

Segment 3 would consist of rebuilding about 4.8 miles of existing double-circuit, 115/230-kV Elverta-North City and Elverta-Natomas transmission lines within an existing ROW between Elverta and Natomas substations. The existing transmission line structures and conductors would be removed prior to constructing the new structures and conductors. Foundations would be removed sufficiently below grade to allow for roadwork and infrastructure projects to occur in the future.

3.3 ALTERNATIVES

Each alternative is identified as the abbreviated name of the Segment 2 option and includes the corresponding Segment 2 option, as well as Segments 1 and 3. For example, Alternative A3 includes Segments 1, 2A3, and 3. Table 3-1 shows

[1] The Community Separator is an open-space area used for creating community form and image, and a sense of place, which provides clear separation between communities, defines the transition between urban and rural uses, and provides gateways that define entrances to a city. A greenbelt is proposed from the Sutter and Sacramento county lines to approximately one mile south of the county lines to separate Sutter County and Sacramento City's Urban Reserve Area. The Urban Reserve is the area outside of Sacramento City's Sphere of Influence in which future development and extension of municipal services are contemplated but not imminent.

Table 3-1. Summary of New Disturbance for Each Alternative

Alternative Description	Total Miles	Total ROW Acres	New Structures[a]			Access Roads[b]			Pulling Sites[c]		Material Storage[d]		Total Construction Acres	Total Long-term Acres
			Approximate Number	Construction Acres	Long-term Acres	Miles	Construction Acres	Long-term Acres	Number	Construction Acres	Number	Construction Acres		
A1-East[e]	33.6	509.1	161	37.1	1.6	28.8	52.4	52.4	12	4.8	2	10.0	104.3	54.0
A1-West[f]	33.8	512.1	162	37.3	1.6	29.0	52.7	52.7	12	4.8	2	10.0	104.8	54.3
A2-East[e]	33.5	507.6	161	37.0	1.6	28.7	52.2	52.2	12	4.8	2	10.0	104.0	53.8
A2-West[f]	33.7	510.6	162	37.2	1.6	28.9	52.5	52.5	12	4.8	2	10.0	104.6	54.2
A3-East[e]	33.8	512.1	162	37.3	1.6	29.0	52.7	52.7	12	4.8	2	10.0	104.8	54.4
A3-West[f]	34.0	515.1	163	37.5	1.6	29.2	53.1	53.1	12	4.8	2	10.0	105.4	54.7
A4-East[e]	35.2	533.3	169	38.9	1.7	30.4	55.3	55.3	12	4.8	2	10.0	108.9	56.9
A4-West[f]	35.4	536.3	170	39.1	1.7	30.6	55.6	55.6	13	5.2	2	10.0	109.9	57.3
A5-East[e]	33.7	510.6	162	37.2	1.6	28.9	52.5	52.5	12	4.8	2	10.0	104.6	54.2
A5-West[f]	33.9	513.6	163	37.4	1.6	29.1	52.9	52.9	12	4.8	2	10.0	105.1	54.5
B	31.3	474.2	150	34.6	1.5	26.5	48.2	48.2	11	4.4	2	10.0	97.1	49.7
C	37.6	569.7	180	41.5	1.8	23.4	42.5	42.5	13	5.2	2	10.0	99.3	44.4
No Action	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Burleson 2007

[a] **Structure Assumptions**

Assume a new structure every 1,100 feet

Assume 0.23 construction acre disturbances for each structure, based on a 100- by 100-foot construction area

Assume 0.01 long-term acre disturbances for each structure, based on a 10- by 10-foot structure footprint rounded up

[b] **Access Road Assumptions**

Assume no disturbance for Segment 3 access roads because they are in existing Right-of-Way (ROW)

Assume access roads parallel to transmission lines for Segments 1, 2A1, 2A2, 2A3, 2A4, 2A5, and 2B

Assume 6.3 miles of new access road for 2C portion (9.4 miles is along existing ROW)

Assume 15-foot width for access roads

Assume road disturbance acres for long- and short-term = miles*5280*15'width\43,560

[c] **Assume a pulling site every 3 miles and short-term disturbance of 0.4 acre per site**

[d] **Assume materials storage yard every 15 miles and short-term disturbance of 5 acres per site**

[e] **East alignment would parallel the east side of Highway 99**

[f] **West alignment would parallel the west side of Highway 99**

disturbances from each alternative, which were summed from individual segment disturbances presented in Appendix B. Alternatives A1, A2, A3, A4, and A5 would have slightly different acreages of disturbance depending on whether the alternatives traverse the east or west side of SR 99; the higher values are used in this SEIS and EIR.

3.3.1 Alternative A1

Alternative A1 includes Segments 1, 2A1, and 3. It would construct about 33.8 miles of new double-circuit, 230-kV transmission line on about 162 structures and would require up to 52.7 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission lines.

3.3.2 Alternative A2

Alternative A2 includes Segments 1, 2A2, and 3. It would construct about 33.7 miles of new double-circuit, 230-kV transmission line on about 162 structures and would require up to 52.6 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission lines.

3.3.3 Alternative A3

Alternative A3 includes Segments 1, 2A3, and 3. It would construct about 34.0 miles of new double-circuit, 230-kV transmission line on about 163 structures and would require up to 53.1 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission lines.

3.3.4 Alternative A4

Alternative A4 includes Segments 1, 2A4, and 3. It would construct about 35.4 miles of new double-circuit, 230-kV transmission line on about 170 structures and would require up to 55.6 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission lines.

3.3.5 Alternative A5

Alternative A5 includes Segments 1, 2A5, and 3. It would construct about 33.9 miles of new double-circuit, 230-kV transmission line on about 163 structures and would require up to 52.9 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission lines.

3.3.6 Alternative B

Alternative B includes Segments 1, 2B, and 3. It would construct about 31.3 miles of new double-circuit, 230-kV transmission line on about 150 structures and would require up to 48.2 acres of access roads. The alternative would rebuild about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission lines.

3.3.7 Alternative C

Alternative C includes Segments 1, $2C_1$, $2C_2$, and 3. It would construct about 37.6 miles of new double-circuit, 230-kV transmission line on about 180 structures and would require up to 42.5 acres of access roads. Alternative C would abandon about 8.7 miles of existing Cottonwood-Roseville transmission line. The alternative would replace about 4.8 miles of existing Elverta-North City and Elverta-Natomas transmission lines.

3.3.8 No Action

The No Action Alternative would include operation and maintenance of the existing transmission lines. Western would not build any of the new transmission line segments presented in Section 3.2. Implementing this alternative would preclude most short-term environmental impacts associated with construction activities. This alternative would not meet the Project's Purpose and Need. The No Action Alternative would not alleviate the greater Sacramento Area power system voltage stability, reliability, and security problems. While Western and interconnected transmission system owners, Load Serving Entities, and area utilities would continue to take appropriate measures to manage power system reliability they may be unable to meet system reliability standards and contractual obligations under the No Action Alternative.

3.3.9 Alternatives Eliminated from Detailed Review

Alternatives eliminated from further evaluation in this Draft SEIS and EIR are presented in Appendix A. In addition, the rationale for dismissing them is discussed. Engineering considerations were the primary factor in eliminating several alternatives.

3.4 PROJECT ACTIVITIES

The proposed Project would include constructing a new double-circuit, 230-kV transmission line from the O'Banion Substation to a point south of the

Elverta Substation and rebuilding about 4.8 miles of an existing 230-kV/115-kV, double-circuit transmission line between Elverta and Natomas Substations. Elements for construction and rebuilding would consist of:

- Designs
- ROW requirements
- Engineering surveys
- Detailed siting
- Material storage yards
- Access roads
- Circuit outage
- Dismantling
- Excavation and foundation construction
- Structures
- Conductor stringing
- Equipment additions in substations
- Abandonment
- Cleanup and reclamation
- Operation and maintenance

Typical personnel and equipment needed for construction operations are listed in Table 3-2. The tasks would be conducted in stages; therefore, personnel and equipment would not be working on all tasks simultaneously at a given location.

3.4.1 Design

All conductors, structures, and equipment would meet the National Electric Safety Code (NESC) and any other applicable criteria. Self-supporting monopole steel structures are available for double-circuit, 230-kV transmission lines.

3.4.2 Right-of-Way Requirements

New transmission lines (Segments 1, 2A1, 2A2, 2A3, 2A4, 2A5, 2B, and 2C) would require new 100- to 125-foot-wide ROW. Segments 3 and a portion of $2C_1$ would not require new ROW because Western would build or rebuild the transmission line in existing ROW. When the final route is determined, Western would acquire land rights in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646), as amended. Western would purchase rights through negotiations with landowners at fair market value, based on independent appraisals. Landowners would retain title to the land and could continue to use the property in ways that would be compatible with the transmission line. Western would clear ROW vegetation to provide suitable access for construction equipment and adequate structure and conductor clearance. Shrubs and trees would be cleared or trimmed from access roads, structure sites, pulling sites, and material storage yards.

3.4.3 Engineering Surveys

Surveys would be used to locate the transmission line centerline, property lines, and corners; provide accurate ground profiles along the centerline; locate structures; and determine the exact locations and rough ground profiles for new access roads. Initial centerline survey work, consisting of survey control, corridor centerline location, profile surveys, and structure staking, would occur before construction. This information would help complete legal descriptions of proposed properties. Soils would be tested to determine physical properties, including the ability to support the proposed structures. Western would work with affected landowners during the initial route selection and structure-siting process to reduce or eliminate impacts to land uses and avoid or minimize disturbance to sensitive environmental areas.

3.4.4 Detailed Siting

Facility siting and the location of related activities would be selected to reduce or eliminate impacts to existing and planned land uses and to avoid or minimize disturbances to landowners and sensitive environmental areas. Western would work with landowners to site material storage yards and access roads.

3.4.5 Material Storage Yards

Temporary material storage yards would be required near the transmission line and public access ways at intervals of about 15 miles. These areas would serve as reporting locations for workers, parking spaces for vehicles, and storage spaces for equipment and materials. Each material storage yard would cover about 5 acres (400 by 540 feet). Areas would be selected that require as little clearing and grading as possible. In most cases, existing substations would serve as material storage yards.

3.4.6 Access Roads

Wherever possible, access to each structure would be within and along the ROW. Access roads (15 feet wide) would be required for construction and maintenance activities. Western assumes that new access roads would be constructed along the entire length of new transmission lines in new ROW to be used during construction and thereafter for

Table 3-2. Typical Assumptions for Personnel and Equipment Required

Tasks	Staffing[a]	Equipment
Right-of-Way (access roads, gates and clearing)	2 to 4 equipment operators	1 motor grader 1 pickup truck 1 bulldozer 1 backhoe
Excavation	2 to 4 laborers/equipment operators	2 augers 1 backhoe 1 pickup truck 1 compressor
Foundations (anchor bolt/rebar cages)	4 to 6 laborers/equipment operators 3 to 5 ironworkers	2 flat-bed trucks 2 pickup trucks 2 air compressors 2 hydro lifts 2 welders 2 to 3 mixer trucks per structure for direct-embedded foundations or 10 to 12 mixer trucks per structure anchor bolt foundations
Steel Haulout	4 to 6 laborers/equipment operators	2 hydro-cranes 4 pickup trucks 2 tractors
Steel Assembly and Structure Erection	4 to 6 linemen/laborers and crane operators	2 hydro-cranes 2 tractors 2 manlifts 2 pickup trucks
Wire Stringing	20 to 25 linemen/groundmen	2 pullers 2 tensioners 2 bulldozers 4 reel trailers 1 materials truck 2 manlifts 5 to 6 pickup trucks 1 light truck
Cleanup and Revegetation	2 to 4 laborers	1 bulldozer w/ripper 1 blader 1 front-end loader 1 tractor/harrow/disc 1 light truck

Source: Burleson 2007

[a] Approximate total work force at one time: 25 individuals

maintenance activities. This assumption will be refined following detailed system design. New access roads would be routed to minimize environmental impacts to water, soil, habitat, vegetation, landowner improvements, and other identified sensitive resources. Gates and fences disturbed or damaged from access road construction would be restored to their preconstruction condition. Access roads would be maintained as graded and culverts would be constructed, as required.

3.4.7 Circuit Outage

During construction, Western and SMUD would need to de-energize portions of the existing transmission line and adjacent lines to complete work for public and construction crew safety. Western would plan and coordinate outages with its customers and control area operator to minimize temporary impacts.

3.4.8 Dismantling of Lines Associated with Reconstruction

Existing structures that would require replacement along Segment 3 would be dismantled. Footings of the dismantled structures would be removed to a depth of 5 feet below grade and the remainder left in place.

3.4.9 Excavation and Foundation Construction

Minor grading and vegetation removal may be required at structure sites and staging areas to support transmission line construction. Typical construction clearing for each structure would require an area of about 100 by 100 feet. Each structure would occupy a footing area of about 10 by 10 feet. Where grading is required, topsoil would be removed, stockpiled, and seeded, as required, to prevent erosion.

Foundations for new structures would be excavated to a depth of up to 30 feet, casings placed, and concrete poured into casings. Structures would be assembled, erected, and attached to foundations. Strings of insulators would support the conductor. Excess fill material would be spread evenly around the structure base to provide positive site drainage. Waste cement management or washing of cement trucks would comply with Western's *Environmental Quality Protection Manual for Construction Standards*.

After construction, Western would regrade disturbed areas to establish original contours as near as practicable to the original, and then redistribute topsoil. Temporary topsoil stockpiles would be protected from erosion during construction in accordance with EPM 90. Excess soil would be spread evenly around the structure base to direct site drainage away from structures.

3.4.10 Structures

Based on comments received from the public, Western and SMUD management have decided to use monopole structures for new construction because they would require less land disturbance than lattice structures, allow for easier vegetation maintenance, and were considered more aesthetically pleasing. Western would use about 150 to 180 monopole steel structures, as presented in Figure 3.1-13. Structure locations would require enough room to allow structure assembly and crane-landing areas. Additional space would be needed outside the ROW to accommodate pulling and tensioning areas at angle structures. Trucks or helicopters would transport structure components to the sites. A crane would be used to erect structures. Additional equipment may include the following: cranes (ground or helicopter), augers, bulldozers, bucket trucks, backhoes, air compressors, electric generators, pickup trucks and other vehicles, machinery, and other equipment.

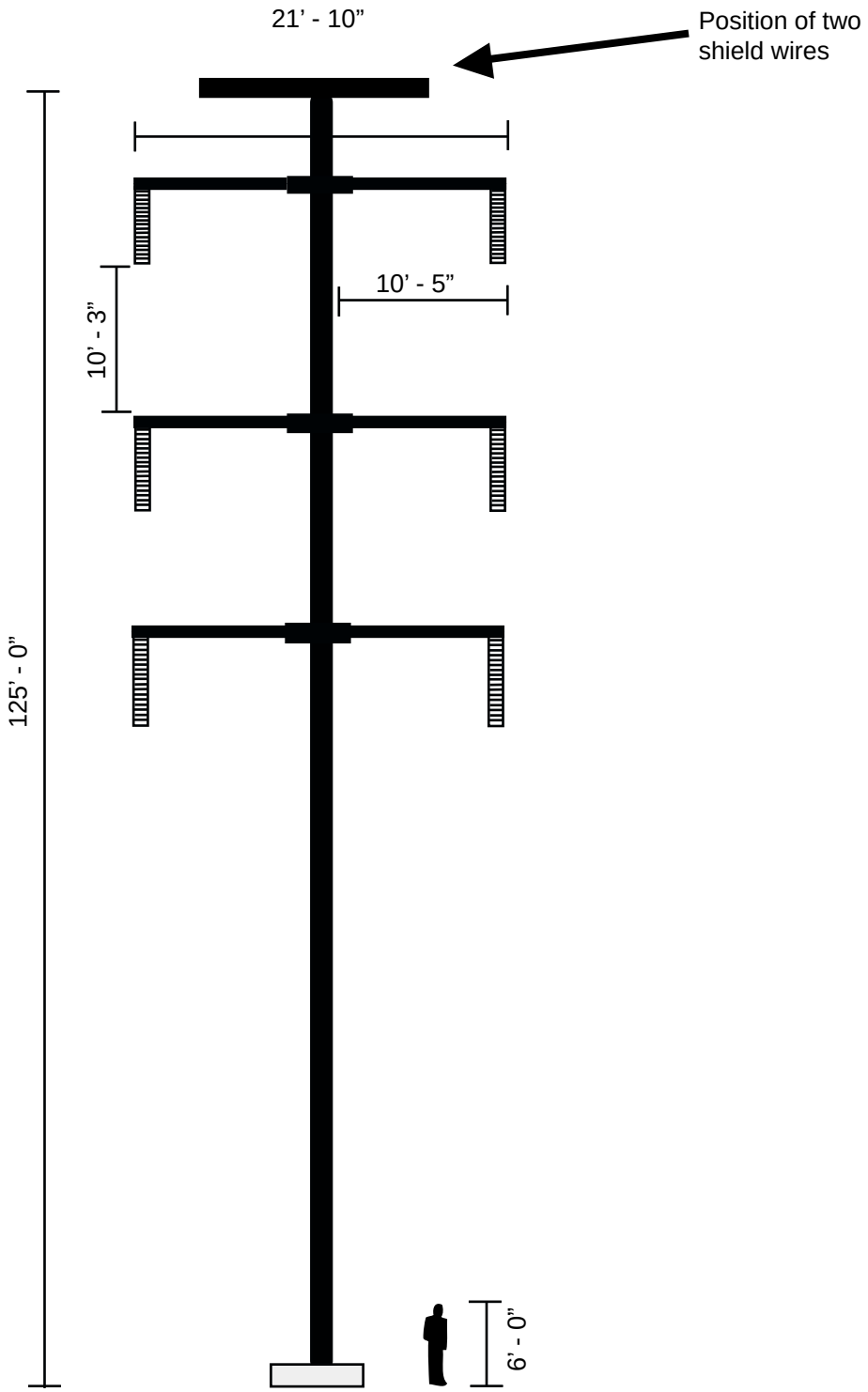
3.4.11 Conductor Stringing

Flatbed trucks would carry conductor reels to the various conductor-pulling sites along the ROW. Typically, conductor-pulling sites would be spaced at 15,000- to 20,000-foot intervals. However, distances would vary, depending on the geography, topography, and sensitivity of the specific area; the length of the line; and the accessibility by equipment.

Stringing rollers (pulleys) would be attached to the ends of the insulator strings. A rope would be connected to the conductor and shield wire used to pull the line from structure to structure during new construction. This process secures and supports the conductor and allows it to roll freely as it is threaded from structure to structure. Crews would use the existing conductors to pull the new conductors. Splicing would occur at pulling sites. Conductors would be adjusted to proper sag and tension and the stringing roller wheels would be replaced with insulator strings, to which conductors would be secured. Temporary guard structures would be installed at prescribed locations to ensure the conductor does not sag into roads or other locations that could result in a safety hazard.

Equipment would include stringing trailers, tensioning machines, pullers, bulldozers, and several trucks, including a bucket truck. Stringing equipment at each pulling site would be set up about 300 feet from the initial structure. Pulling sites would require an area of 0.4 acre (125 by 125 feet). These sites would be located along the transmission line centerline. Where transmission lines turn at severe angles, pulling sites would be required

230-kV Steel Monopole



(Dimensions are typical)

SACRAMENTO AREA VOLTAGE SUPPORT
Supplemental EIS and EIR

Figure 3.1-13
230-kV Steel Pole
Transmission Structure

outside of the ROW. Western would locate the pulling site at a distance greater than three times the height of the structure (i.e. for a 125-foot high structure, the pulling site would be about 375 feet from the structure). Western would attempt to use existing disturbed land for angle pulling sites; however, if unavailable, Western would find a stable area to pull outside of the ROW.

3.4.12 Equipment Additions in Substations

Work inside the O'Banion Substation would include populating three existing bays with five new 230-kV breakers, eight new motor-operated disconnect switches, structural steel, overhead electrical bus, concrete foundations, buried conduits, and control cabling. Control panels and communication equipment would be installed inside the existing control room. Work inside the Elverta and Natomas substations would include installation of outdoor metering structures and equipment, buried conduits and cabling, and additional control, metering, and communication equipment inside both substation control rooms.

3.4.13 Abandonment

About 8.6 miles of Cottonwood-Roseville transmission lines would be abandoned for Alternative C (see Figure 3.1-11). Structures, foundations, conductors, shield wires, insulators, and hardware would be removed for about 2.9 miles where Segment $2C_1$ would use the abandoned ROW. Structures would be left in place for the remaining 5.8 miles of abandoned Cottonwood-Roseville transmission line with conductors, shield wires, insulators, and hardware removed.

3.4.14 Cleanup and Reclamation

Waste materials and debris from construction areas would be collected, hauled away, and disposed of at approved landfill sites. Typical equipment used for these activities would include a grader, front-end loader, tractor, and dozer with a ripper.

Procedures for vegetation clearing, restoration, and ROW maintenance would be implemented as standard construction and reclamation measures. Disturbed areas would be returned to their natural contours, to the extent practicable, including reseeding as required and installing cross drains for erosion control.

Vegetation within ROW would be low-growing for the life of the proposed Project to ensure that growth does not jeopardize the safety or reliability of the line.

3.4.15 Operation and Maintenance

Typical activities associated with operating and maintaining transmission lines would be conducted similar to activities on existing transmission lines. The amount of power transferred along the conductors would vary, depending on seasonal and time-of-day loads, as well as other system demands. Western's power system dispatchers would direct day-to-day and emergency transmission line operation in accordance with Western's *Power System Operations Manual* (Western 1996), as amended.

Western would maintain the proposed transmission system by monitoring, testing, repairing, and replacing equipment. Typical maintenance activities include:

- Periodic routine aerial and ground inspections to identify and repair damaged structures, conductors, and insulators;
- Periodic and emergency aerial and ground inspections after natural or weather events or reported vandalism;
- Routine scheduled maintenance;
- Access road maintenance to regrade and fill gullies, clear and repair culverts, and repair erosion-control features and gates; and
- Vegetation management activities, including cutting, trimming, and clearing trees, brush, noxious weeds, and undergrowth. Activities may involve mechanical and chemical control methods.

Some land-use impacts could occur during routine maintenance activities and increase during emergencies. Western would restore damaged areas or compensate landowners when responsible for damage. Past emergency activities have been infrequent and restricted, in most cases, to a small area. Existing and planned land uses would be allowed to continue in the ROW to the extent that such uses do not interfere with the ROW as described in the ROW Agreement.

3.5 ENVIRONMENTAL PROTECTION MEASURES

Western and SMUD have developed EPMs to reduce environmental consequences associated with construction activities. Environmental consequences for each resource area (see Chapter 4) assume that

EPMs specified in Table 3-3 would be fully implemented. Western would use these practices on both public and private lands. These EPMs would be implemented consistent with regulatory and industry standards for any activity proposed.

Table 3-3. Environmental Protection Measures

No.	Resource	Environmental Protection Measures
1	Air Quality	Western would adhere to all requirements of those entities having jurisdiction over air quality matters and obtain any permits needed for construction activities. Open burning of construction trash would not be allowed.
2	Air Quality	Project participants would use reasonably practicable methods and devices to control, prevent, and otherwise minimize atmospheric emissions or discharges of air contaminants.
3	Air Quality	Visible emissions from all off-road diesel-powered equipment would not exceed 40 percent opacity for more than three minutes in any one hour.
4	Air Quality	Equipment and vehicles that show excessive emissions of exhaust gases caused by poor engine adjustments or other inefficient operating conditions would not be operated until corrective repairs or adjustments were made.
5	Air Quality	Vehicles and equipment used in construction and maintenance of the proposed Project or alternatives would maintain appropriate emissions control equipment and be appropriately permitted.
6	Air Quality	Road construction would include dust-control measures such as watering and other approved suppressing agents for limiting dust generation.
7	Air Quality	Fill material storage piles would include dust-control measures such as water or chemical suppressants.
8	Air Quality	Ground surfaces that have been significantly disturbed would be seeded appropriately to prevent wind dispersion of soil.
9	Air Quality	Removal of vegetation and ground disturbance would be limited to the minimum area necessary to complete proposed Project construction activities. Vegetative cover would be maintained on all other portions of the proposed Project area.
10	Air Quality	Regular watering of exposed soils and unpaved access roads would be conducted during the construction period.
11	Air Quality	Grading activities would cease during periods of high winds (greater than 20 miles per hour averaged over 1 hour).
12	Air Quality	Trucks transporting loose material would be covered or would maintain at least 2 feet of freeboard and not create any visible dust emissions.
13	Air Quality	Excessive engine idling will be minimized according to Placer County and City of Sacramento regulations.
14	Air Quality	A comprehensive inventory (e.g., make, model, year and emission rating) would be submitted to the relevant air districts of all the heavy-duty off-road equipment (50 horsepower or greater) that would be used in aggregate of 40 or more hours for the construction project. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative shall provide the air districts with the anticipated construction timeline, including start date, name and phone number of the project manager and on-site foreman. Heavy-duty equipment would meet the standard emissions reduction of 20 percent NO_x and 45 percent PM_{10} compared to the most recent California Air Resources Board (CARB) fleet average at the time of construction.
15	Biological Resources	Mitigation measures developed during the consultation period under Section 7 of the Endangered Species Act (ESA) would be adhered to, as specified in the subsequent Biological Opinion of U.S. Fish and Wildlife Service (USFWS). In addition, applicable mitigation developed in conjunction with state and Tribal authorities would be followed.

Table 3-3. Environmental Protection Measures

No.	Resource	Environmental Protection Measures
16	Biological Resources	Before construction and maintenance, all personnel would be instructed on the protection of cultural, paleontological, and ecological resources. To assist in this effort, the construction and maintenance contract would address applicable Federal, state, local and Tribal laws regarding collection and removal antiquities, fossils, plants, and wildlife. Training would include the importance of these resources and the purpose and necessity of protecting them.
17	Biological Resources	Special-status species and their habitats would be protected during post-EIS and EIR phases of the project. This may involve conducting surveys for habitat, plant, and wildlife species of concern. Where special-status species or their habitats are found, appropriate action would be taken to avoid adverse impacts on the species and/or their habitat.
18	Biological Resources, Wetlands	A qualified biologist would conduct surveys in sensitive habitats before clearing vegetation. The purpose of this survey would be to identify biologically sensitive issues such as wetlands, vernal pools, or habitat of concern. Western would avoid or use best management practices to lessen disturbance.
19	Biological Resources	During construction and maintenance, no equipment refueling or oil changing would be conducted within 300 feet of any bodies of water or streams.
20	Biological Resources	Within riverine habitat, ROW clearing would be done by mechanical and manual methods. Construction and maintenance activities would be avoided within 100 feet of the stream bank.
21	Biological Resources	Vegetation would be controlled or removed in accordance with Western's *Integrated Vegetation Management Environmental Guidance Manual* (Western 2007b).
22	Biological Resources, Wetlands	To the extent practical, freshwater emergent, lacustrine, and riverine wetlands would be spanned and vehicular traffic would not encroach within 100 feet of the boundary of these wetlands.
23	Biological Resources, Wetlands	To the extent practical, when water is present, vernal pools would be driven around, spanned, or otherwise avoided.
24	Biological Resources	Replacing insulators on structures containing active raptor nests would be conducted after birds have fledged. Inactive nests would not be removed from structures unless they pose a safety or reliability hazard.
25	Biological Resources, Water Resources	Western would span the Feather River and Cross Canal riparian corridor and no construction or maintenance equipment would cross these water bodies. Sedimentation control structures would be used to prevent sediment from reaching riverine habitat.
26	Biological Resources, Floodplains, Water Resources, Wetlands	Hazardous materials would not be drained onto the ground or into streams or drainage areas. All construction and maintenance waste would be removed daily. This would include trash and litter, garbage, other solid waste, petroleum products, and other regulated materials. The materials would be sent to a disposal facility authorized to accept such materials.
27	Biological Resources, Soils	At completion of work and at the request of the land owner/manager, all work areas except access roads would be scarified or left in a condition that would facilitate natural vegetation. The site would be recontoured to provide for proper drainage, and prevent erosion.
28	Biological Resources	Equipment would be washed prior to entering sensitive areas within the Project area to control noxious weeds. The rinse water would be disposed of through the sanitary sewage system.
29	Biological Resources	**Vernal pool resources–specific.** Biological reconnaissance surveys, preconstruction surveys, and other biological investigations would be conducted to identify on-site vernal pool resources. If it is determined that wetland and/or vernal pool resources occur, Western would consult with USFWS. Western would assume presence of listed species in suitable vernal pools. Section 7 consultation with USFWS would determine appropriate measures to avoid and minimize loss of individuals.

Table 3-3. Environmental Protection Measures

No.	Resource	Environmental Protection Measures
30	Biological Resources	**Boggs Lake hedge hyssop and legenere–specific.** If preconstruction surveys determine the presence of the species, Western would consult with USFWS to determine appropriate measures to avoid and minimize loss of individuals.
31	Biological Resources	**Riparian habitat-specific.** If riparian vegetation requires replacement, it will be replaced at a 3:1 ratio on site or within the watershed, using native riparian trees and/or vegetation.
32	Biological Resources	**Valley elderberry longhorn beetle-specific.** Surveys for beetles and elderberry host plants by a qualified biologist will be conducted prior to construction and maintenance activities. To the maximum extent practicable, the project will avoid stands of elderberry bushes and avoid isolation of elderberry bushes from other nearby plant populations
33	Biological Resources	**Valley elderberry longhorn beetle-specific.** If elderberry plants cannot be avoided, and if approved by the USFWS through consultation, then transplantation/replacement mitigation measures may be implemented. Preconstruction surveys will assess the appropriate amount of mitigation.
34	Biological Resources	**Western spadefoot toad–specific.** If preconstruction surveys determine the presence of the toad, Western would consult with USFWS to determine appropriate measures to avoid and minimize take of individuals.
35	Biological Resources	**Giant garter snake-specific.** Preconstruction surveys for giant garter snake would be completed by a qualified biologist approved by USFWS. If any snake habitat is found, additional measures would be implemented to minimize disturbance of habitat and harassment of the species.
36	Biological Resources	**Giant garter snake-specific.** Between April 15 and September 30, all irrigation ditches, canals, or other aquatic habitat would be completely dewatered, with no puddle water remaining, for at least 15 consecutive days prior to the excavation or filling in of the dewatered habitat. Efforts would be made to ensure that dewatered habitat does not continue to support prey. If a site cannot be completely dewatered, netting and salvage of prey items may be necessary.
37	Biological Resources	**Giant garter snake-specific.** For sites containing snake habitat, and no more than 24 hours prior to start of construction activities (site preparation and/or grading), the Project area would be surveyed for the presence of the snake. If construction activities stop on the site for a period of 2 weeks or more, a new snake survey would be completed no more than 24 hours prior to the resumption of construction activities.
38	Biological Resources	**Giant garter snake-specific.** Clearing would be confined to the minimal area necessary to facilitate construction and maintenance activities. Giant garter snake habitat within or adjacent to the Project would be flagged and designated as environmentally sensitive areas. This area would be avoided by all construction personnel.
39	Biological Resources	**Giant garter snake-specific.** If a live giant garter snake is found during construction and maintenance activities, USFWS and the Project's biological monitor will be notified immediately. The biological monitor or his/her assignee shall do the following: 1. Escape routes for snakes should be determined in advance of construction and maintenance and snakes should always be allowed to leave on their own. 2. Stop construction and maintenance activities in the vicinity of the snake. 3. Monitor the snake and allow it to leave on its own. The monitor shall remain in the area for the remainder of the workday to make sure that the snake is not harmed, or if it leaves the site, that it does not return. If a giant garter snake does not leave on its own within 1 working day, further consultation with USFWS is required.
40	Biological Resources	**Giant garter snake-specific.** If any temporary fill and/or construction debris situated near undisturbed giant garter snake habitat is to be removed between October 1 and April 30, it would be inspected by a qualified biologist to ensure the snakes are not using it as an overwintering site.

Table 3-3. Environmental Protection Measures

No.	Resource	Environmental Protection Measures
41	Biological Resources	**Giant garter snake-specific.** No plastic, monofilament, jute, or similar erosion control matting that could entangle snakes would be placed on a Project site when working within 200 feet of snake habitat. Possible substitutions include coconut coir matting, tactified hydroseeding compounds, or other material approved by USFWS.
42	Biological Resources	**Northwestern pond turtle–specific.** Take of the turtle as a result of habitat destruction during construction and maintenance activities, including maintenance and removal of irrigation ditches and drains, would be minimized by the dewatering requirements described for the giant garter snake.
43	Biological Resources	**Chinook salmon or steelhead-specific.** The site would be monitored to ensure that no listed fish are present and/or harmed if working in a water channel. If listed fish are present, NMFS and CDFG, if appropriate, would be consulted.
44	Biological Resources	**Western yellow-billed-specific.** If preconstruction surveys or other sources determine the presence of nesting birds, construction avoidance areas would be enforced for a distance of 300 feet from the nest site, until young birds have fledged and left the nesting site.
45	Biological Resources	**Bank swallow-specific.** Disturbances to nesting colonies would be avoided within the nesting season of May 1 through August 31, or until a qualified biologist, with concurrence of USFWS and CDFG, if appropriate, has determined that the young have fledged or the nests are no longer occupied.
46	Biological Resources	**Bank swallow-specific.** If preconstruction surveys identify an active nesting colony, brightly colored construction fencing will be installed 250 feet from the active nesting colony. No construction disturbances will occur within the 250-foot fenced area during the nesting season In addition, disturbances within 0.5 mile upstream or downstream of a colony located on a natural waterway would be avoided.
47	Biological Resources	**Tricolored blackbird-specific.** If preconstruction surveys determine the presence of breeding and nesting birds, disturbances to nesting colonies would be avoided. A boundary shall be marked by brightly colored construction fencing establishing a 500 foot buffer from the active nest site. No disturbances would occur within the 500 foot area during the nesting season, February 1 to August 1 or while birds are present. Before the site can be disturbed, a qualified biologist, with concurrence by USFWS, would determine if the young have fledged and nest sites are no longer active.
48	Biological Resources	**Burrowing owl-specific.** Preconstruction surveys would be conducted prior to earth-disturbing activities to determine the presence of foraging or nesting owls. The surveys would be conducted by a qualified biologist. Results of the preconstruction surveys would be submitted to the land use agency with jurisdiction over the site prior to commencement of construction activities and a mitigation program would be developed and agreed to by the land use agency and Western prior to initiation of any physical disturbance on site.
49	Biological Resources	**Burrowing owl-specific**. Occupied burrows shall not be disturbed during nesting season (February 1 through August 31). No disturbance should occur within 50 meters of occupied burrows during the non-breeding season (September 1 to January 31) or within 75 meters during the breeding season (February 1 to August 31). A minimum of 6.5 acres of foraging habitat, contiguous with occupied burrow sites, would be permanently preserved for each pair of breeding burrowing owls or single unpaired resident bird.
50	Biological Resources	**Burrowing owl-specific.** If nests are found, USFWS and CDFG, if appropriate, would be contacted regarding suitable mitigation measures. These may include a 300 foot buffer around the nest site during the breeding season, relocation efforts for owls that have not begun egg-laying and incubation, or relocation of juveniles capable of independent survival. If on-site avoidance is required, the boundaries of the buffer zone would be determined by a qualified biologist and marked with yellow caution tape, stakes, or temporary fencing. The buffer zone would be maintained throughout the construction period. If relocation is approved by USFWS, a qualified biologist will prepare a plan for relocating the owls to a suitable site.

Table 3-3. Environmental Protection Measures

No.	Resource	Environmental Protection Measures
51	Biological Resources	**Swainson's hawk-specific.** A preconstruction survey would be completed to determine if active Swainson's hawk nest sites occur on or within 0.5 mile or if any Swainson's hawk nest trees would be removed on the Project site. Surveys would be conducted by experienced Swainson's hawk surveyors using Swainson's hawk Technical Advisory Committee's methods (May 31, 2000 or newer), as approved by USFWS.
52	Biological Resources	**Swainson's hawk-specific.** If breeding hawks are identified, no disturbances would occur within 0.5 mile of an active nest between March 15 and September 15, or until a qualified biologist, with discussion with CDFG, if appropriate, has determined that the young have fledged or the nest is no longer occupied. If an active nest site is located within 0.25 mile of existing urban development, a no-disturbance zone of 0.25 mile would be set.
53	Biological Resources	**Swainson's hawk-specific.** Where disturbance of a hawk nest cannot be avoided, construction would be deferred until after the nesting season. Then, if necessary, the nest tree may be removed after discussion with CDFG, if appropriate, and it has been determined that the young are no longer dependent upon the nest tree.
54	Biological Resources	**Swainson's hawk-specific.** If construction activities would cause nest abandonment or force out fledglings within a 0.25-mile buffer zone of the Project area, an on-site qualified raptor biologist would be assigned to the project.
55	Biological Resources	**Swainson's hawk-specific.** Valley oaks, tree groves, riparian habitat, and other large trees used by Swainson's hawk and other animals will be preserved wherever possible. If Swainson's hawk nest trees are lost, Western would implement mitigation planting.
56	Biological Resources	Upon locating dead, injured or sick threatened or endangered species, the USFWS Division of Law Enforcement (2800 Cottage Way, Sacramento, CA 95825) or the Sacramento Fish and Wildlife Ecological Services Office (2800 Cottage Way, Room W 2605, Sacramento, CA 95825, telephone 916 414 6000) must be notified within 1 working day. Written notification to both offices must be made within 3 calendar days and must include the date, time, and location of the discovery and any other pertinent information.
57	Cultural Resources, Paleontological Resources	Before construction, all supervisory construction personnel would be instructed by Western on the protection of cultural, paleontological, and ecological resources and that cultural resources might be presented in the study area. To assist in this effort, the construction contract would address applicable Federal and state laws regarding antiquities, fossils, plants, and wildlife, including collection and removal, and the importance of these resources and the purpose and necessity of protecting them. Contractors would be trained to stop work near any discovery and notify Western's regional environmental manager, who would ensure that the resource is evaluated and avoided. Known cultural resources would be fenced and a minimum distance maintained for work disturbances.
58	Cultural Resources	Where ground-disturbing activities are identified, cultural resource evaluations would be done to determine the need for field inventory. Construction activities would avoid all historic properties or a special use permit or Memorandum of Agreement would be developed in consultation with the State Historic Preservation Office (SHPO). Avoidance would include the use of temporary construction fencing where activities are planned to take place near cultural resources sites boundaries.
59	Cultural Resources, Floodplains, Water Resources, Wetlands	Direct impacts to irrigation system and drainage canal features that are eligible for the NRHP would be avoided during the siting of new transmission line structures and access roads and most other irrigation system features would be avoided to the extent practicable in siting new structures and access roads.

Table 3-3. Environmental Protection Measures

No.	Resource	Environmental Protection Measures
60	Cultural Resources	Cultural resources would be considered during post-EIS phases of proposed Project implementation. Surveys would be completed to inventory and evaluate cultural resources of the Preferred Alternative, or of any components that might be added to the project, or any existing components that would be modified. These surveys and any resulting property evaluation and analysis of effects would be conducted in accordance with Section 106 of the National Historic Preservation Act (NHPA) and in consultation with the SHPO.
61	Electric and Magnetic Fields	Complaints of radio or television interference generated by the transmission line will be responded to and appropriate actions taken.
62	Floodplains, Soils, Water Resources, Wetlands	Surface restoration would occur in construction areas, material storage yards, structure sites, spur roads, and existing access roads where ground disturbance occurs or where recontouring is required.
63	Floodplains, Soils, Water Resources, Wetlands	Access roads would be built at right angles to the streams and washes to the extent practicable. Culverts would be installed where needed. All construction and maintenance activities would be conducted to minimize disturbance to vegetation and drainage channels.
64	Floodplains, Soils, Water Resources, Wetlands	Excavated material or other construction materials would not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters.
65	Floodplains, Soils, Water Resources, Wetlands	Non-biodegradable debris would be collected and removed from the ROW daily and taken to a disposal facility. Slash and other biodegradable debris would be left in place or disposed of.
66	Floodplains, Soils, Water Resources, Wetlands	All soil excavated for structure foundations would be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations. Excess soil would be removed from the site and disposed of appropriately. Areas around structure footings would be reseeded with native plants.
67	Floodplains, Water Resources, Wetlands	Wherever possible, new structures and access roads would be sited out of floodplains. Due to the abundance of floodplains and surface water resources in the study area, complete avoidance may not be possible and Western would consult with U.S. Army Corps of Engineers (USACE).
68	Geology	Geological hazards would be evaluated during final design specification for each structure location and road construction area. Options would include avoidance of a poor site by selection of a site with stable conditions or correction of the unstable slope conditions.
69	Geology, Soils	A California-registered Professional Geotechnical Engineer would evaluate the potential for geotechnical hazards and unstable slopes on the centerline route and areas of new road construction or widening on slopes with more than a 15 percent gradient.
70	Health and Safety, Traffic	Conform with safety requirements for maintaining the flow of public traffic and conduct construction operations to offer the least possible obstruction and inconvenience to public transportation.
71	Health and Safety	Comply with all applicable health and safety laws, regulations, and standards.
72	Health and Safety	Post proper signage in areas within the ROW that would require temporary closure or limited access to accommodate certain land uses.
73	Health and Safety, Traffic and Transportation	Mark structures and/or shield wire with highly visible devices for identified locations, as required by applicable laws and regulations (for example, the Federal Aviation Administration regulations).

Table 3-3. Environmental Protection Measures

No.	Resource	Environmental Protection Measures
74	Land Use	When weather and ground conditions permit, all construction-caused deep ruts that are hazardous to farming operations and moving equipment would be restored to preconstruction conditions or compensation would be provided as an alternative if the landowner desires. Such ruts would be leveled, filled and graded, or otherwise eliminated in an approved manner. Ruts, scars, and compacted soils from construction activities in hay meadows, alfalfa fields, pastures, and cultivated productive lands would be loosened and leveled by scarifying, harrowing, discing, or other appropriate method. Damage to ditches, tile drains, terraces, roads and other features of the land would be corrected. The land and facilities would be restored as nearly as practicable to their original conditions.
75	Land Use	On completion of the work, all work areas except permanent access roads would be returned to pre-construction conditions unless otherwise specified by the land owner/ manager.
76	Land Use	During construction, movement would be limited to the access roads and within a designated area in the ROW to minimize damage to agricultural land.
77	Land Use	Construction operations would be conducted to prevent unnecessary destruction, scarring or defacing of the natural surroundings to preserve the natural landscape to the extent practicable.
78	Land Use	No permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey.
79	Land Use	Damaged fences and gates would be repaired or replaced to restore them to their preconstruction condition.
80	Land Use	Some land uses occurring within the ROW would require temporary closure or limited access. Proper signage would be posted in these areas.
81	Land Use	Power lines would span sensitive land uses to the extent possible. Where practical, access roads would be placed to avoid sensitive areas.
82	Land Use	Where practical, construction activities would be scheduled during periods when agricultural activities would be minimally affected or the landowner would be compensated accordingly.
83	Land Use	Structure design and placement would be selected to reduce potential conflicts with agricultural practices and the amount of land required for transmission lines.
84	Noise	All vehicles and equipment would be equipped with required exhaust noise abatement suppression devices.
85	Noise	Construction and maintenance activities would be consistent with local noise ordinances.
86	Paleontological Resources	Preconstruction surveys of sensitive paleontological areas may be conducted, as agreed upon by the appropriate land-managing agencies and Western.
87	Socioeconomics	Any land temporarily required for construction of the proposed facilities (such as conductor pulling sites and material and equipment storage areas) would be arranged through temporary-use permits or by specific arrangements between the construction contractor and affected landowners. Arrangements would be made with business owners to avoid or minimize disruptions in their business (by posting detours and limiting the area and time of disruption).
88	Socioeconomics	Where new ROW is needed, Western would acquire land rights (easements) in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646), as amended. Easements would be purchased through negotiations with landowners at fair market value, based on independent appraisals. The landowner would normally retain title to the land and could continue to use the property in ways that would be compatible with the transmission line.

Table 3-3. Environmental Protection Measures

No.	Resource	Environmental Protection Measures
89	Soils	Erosion control measures would be implemented to prevent loss of soil. Construction would be in conformance with Western's Integrated Vegetation Management Environmental Guidance Manual.
90	Soils	If wet areas cannot be avoided, Western would use wide-track or balloon tire vehicles and equipment and/or timber mats.
91	Soils, Water Resources, Wetlands	Construction vehicle movement outside of the ROW normally would be restricted to approved access or public roads.
92	Soils, Water Resources, Wetlands	Where feasible, all construction activities would be rerouted around wet areas while ensuring that the route does not cross sensitive resource areas.
93	Soils, Water Resources, Wetlands	Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses would be conducted to prevent muddy water and eroded materials from entering the streams or watercourses.
94	Traffic	Prior to the start of construction, Western would submit traffic control plans to all agencies with jurisdiction of public roads that would be affected by construction activities.
95	Traffic	Western would restrict all necessary lane closures or obstructions on major roadways associated with construction activities to off-peak periods to mitigate traffic congestion and delays.
96	Traffic	Western would ensure that roads or sidewalks damaged by construction activities would be properly restored to their preconstruction condition.
97	Visual Resources	Transmission line construction design would use monopoles whenever possible, rather than lattice structures.
98	Water Resources, Wetlands	Applicable permits, agreements, and certificates for construction in jurisdictional waters or wetlands would be obtained, e.g. from the USACE or RWQCB, as needed.
99	Water Resources, Wetlands	Culverts would be installed where needed to avoid surface water impacts during construction of transmission line structures. All construction activities would be conducted in a manner to avoid impacts to water flow.
100	Water Resources, Wetlands	Runoff from the construction site would be controlled and meet RWQCB storm water requirements and the conditions of a construction storm water discharge permit. A storm water pollution prevention plan would be prepared and implemented.
101	Wetlands	In areas where ground disturbance is substantial or where recontouring is required, vegetation restoration would occur.

3.6 COMPARISON OF ALTERNATIVES

Table 3-4 presents a summary comparison of impacts by resource topic for each alternative. Full discussion can be found in Chapter 4, Affected Environment and Environmental Consequences.

Table 3-4. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Air Quality									
Air emission standards[a]	Short-term construction and maintenance emissions exceed PM_{10}, NO_x, or VOC Air District thresholds	Short-term NO_x emissions would exceed district thresholds[a]							No
Biological Resources[b,c,d]									
Giant Garter Snake Habitat	Effects on giant garter snakes in rice field complexes, freshwater emergent wetlands, and water bodies	ROW would cross 270-283 acres of rice fields	ROW would cross 261-275 acres of rice fields	ROW would cross 281-292 acres of rice fields	ROW would cross 272-277 acres of rice fields	ROW would cross 280-297 acres of rice fields	ROW would cross 163 acres of rice fields	ROW would cross 236 acres of rice fields	No
Vernal Pool Habitat	Effects on vernal pool habitat	ROW would cross 4.0 acres of vernal pools	ROW would cross 4.0 acres of vernal pools	ROW would cross 9.2 acres of vernal pools	ROW would cross 3.4 acres of vernal pools	ROW would cross 3.7 acres of vernal pools	ROW would cross 11.1 acres of vernal pools	ROW would cross 11.8 acres of vernal pools	No
Designated critical habitat for Central Valley steelhead and/or chinook salmon	Effects on Central Valley Steelhead and/or Chinook Salmon	Potential effects on Central Valley Steelhead and Chinook Salmon							No
Sensitive species	Permanent loss of habitat for sensitive species	Sensitive species habitat would be permanently removed							No
Cultural Resources[c]									
Prehistoric cultural resources, historic cultural resources, and TCPs	Impacts to eligible cultural resources or TCPs	No[c]							No

Table 3-4. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Electric and Magnetic Fields[c]									
Corona, field, and health effect	Exposure to EMF	No[c]							NA
Environmental Justice[c]									
Low-income, minority, or subsistence populations in the project area are disproportionately affected	Disproportionate adverse impacts	No[c]							No
Floodplains[c,f]									
Obstructs, decreased capacity to convey flows, destabilization of soils, alter or impair ability of floodplains to convey flows	Increased susceptibility to flooding	No[c,f]							No
Geology[c]									
Subsidence, landslides, or seismic hazards	Erosion, subsidence, landslides, and seismic hazards	No[c]							No
Health and Safety[c]									
Hazardous materials/ waste, electrical hazards, and fall hazards	Mishandling hazardous materials, waste, herbicides, electrical contact, and worker falls	No[c]							No

Table 3-4. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Land Use[c]									
Proximity of new ROW of transmission lines to residences, loss of prime farmland, effects on recreation and open space, and impacts to traffic patterns during construction	Disturbances from construction or operation	Short-term construction impacts[c]							No
	Conflict with approved and/or adopted land use plans Loss of prime and unique farmland	No conflict with existing land use plans. 26 acres of prime farmland would be removed	No conflict with existing land use plans. 22 acres of prime farmland would be removed	No conflict with existing land use plans. 32 acres of prime farmland would be removed	No conflict with existing land use plans. 35 acres of prime farmland would be removed	No conflict with existing land use plans. 30 acres of prime farmland would be removed	No conflict with existing land use plans. 18 acres of prime farmland would be removed	No conflict with existing land use plans. 22 acres of prime farmland would be removed	No
Noise[c]									
Noise average day-night noise levels (L_{dn})	Noise from construction and operation	No[c]							No
Paleontological Resources[c]									
Destruction of significant fossils	Loss of, or inaccessibility to, scientifically important paleontological resources	No[c]							No

Table 3-4. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Socioeconomics[c]									
Displace existing residences or businesses or physically divide a community Degradation or over-commitment of existing goods and services to an extent that would limit the sustainability of existing communities	**Short-term effects:** Disrupting businesses and affecting income and employment	Short-term increased employment in the study area							No
	Long-term effects: Loss of farmland and planned development	Loss of up to 26 acres farmland and 202 acres of development	Loss of up to 27 acres farmland and 206 acres of development	Loss of up to 32 acres farmland and 205 acres of development	Loss of up to 35 acres farmland and 224 acres of development	Loss of up to 30 acres farmland and 202 acres of development	Loss of up to 18 acres farmland and 78 acres of development	Loss of up to 22 acres farmland and 99 acres of development	No
Soils[c]									
Erosion, improper drainage, high water erodibility, steep slopes, and compaction	Loss of top soil, steep slopes, and increase in soil compaction.	No[c]							No
Traffic[c]									
Increase traffic load and capacity of street system, change of traffic patterns, conflict with alternative transportation programs, cause traffic delays, and cause physical harm to roads that is not repaired.	**Short-term effects:** Traffic delays during construction No significant long-term effects	If construction of Segments 2A1 to 2A5 is on the east side of Highway 99, the alignment would cross Highway 99 once near Catlett Road. If construction of these segments is on the west side of Highway 99, the alignment would cross Highway 99 three times; once at Catlett Road, Cross Canal, and the point corresponding with the eastward selection[c]					No[c]	No[c]	No

Table 3-4. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Visual Resources[c]									
Altering existing landscapes, effects to areas of high visual quality or scenic landscapes, and consistency with local and county general plans	**Long-term effects:** Transmission lines constructed along areas with no scenic views or adjacent to existing lines	No[c]	No[c]	No[c]	No[c]	No[c]	No[c]	Alternative C, Segment $2C_2$ would conflict with the City of Roseville's visual resource policy and result in significant indirect and cumulative impacts.	No
Water Resources[c,e]									
Erosion, compaction, and sedimentation or blockage of drainage; introduction of debris, fill, or contamination into surface water or groundwater; damage to irrigation improvements; and depletion of water resources	Sedimentation from construction disturbance, blocked drainage, contaminants reaching surface water or groundwater, damage to irrigation improvements, and depleted water resources.	Western would obtain permits to comply with applicable environmental laws, regulations, and the statewide Construction Storm Water General NPDES Permit, and other applicable permit requirements.[c,e]							No

Table 3-4. Summary of Alternative Impacts

Resource Issue	Potential Impacts	Alternative A1 Impacts	Alternative A2 Impacts	Alternative A3 Impacts	Alternative A4 Impacts	Alternative A5 Impacts	Alternative B Impacts	Alternative C Impacts	No Action
Wetlands[b,c,e]									
Degradation of biological values and wetland functions from excavation, fill, disturbance, or sedimentation; and increased access by humans or invasive species	Short-term effects from construction within wetlands Long-term effects from structures sited in wetlands, vernal pools, and other Waters of the United States	4 structures may be sited in wetland areas[b,e]	4 structures may be sited in wetland areas[b,e]	6 structures may be sited in wetland areas[b,e]	4 structures may be sited in wetland areas[b,e]	4 structures may be sited in wetland areas[b,e]	10 structures may be sited in wetland areas[b,e]	7 structures may be sited in wetland areas[b,e]	No

Source: Burleson 2007

[a] Western would implement EPMs in accordance with air district requirements to minimize impacts.

[b] Western would coordinate with USFWS as part of their Section 7 consultation and CDFG.

[c] Western would adhere to EPMs to minimize impacts.

[d] Western would coordinate removal of elderberry bushes with USFWS.

[e] The proposed Project would span surface water and riparian habitat and avoid wetlands; however, if they could not be spanned or avoided, Western would coordinate with USACE, RWQCB, NOAA Fisheries, and USFWS.

[f] Construction in floodplains may require Western to coordinate with USACE, RWQCB, and/or the California Reclamation Board.

CDFG = California Department of Fish and Game

EPM = Environmental Protection Measures

NA = Not Applicable

NO_x = Nitrogen oxides

PM_{10} = Particulate matter less than or equal to 10 microns in diameter

ROD = Record of Decision

ROW = Right-of-Way

RWQCB = Regional Water Quality Control Board

TCP = Traditional cultural property

USACE = U.S. Army Corps of Engineers

USFWS = U.S. Fish and Wildlife Service

VOC = volatile organic compounds

Western = Western Area Power Administration

CHAPTER 4
Affected Environment and Environmental Consequences

The Affected Environment section for each resource describes existing conditions in the study area and includes background on the resource, definition of the study area, issues of environmental concern, and a characterization of the study area. The Environmental Consequences section provides information on the standards of significance, Western's and SMUD's EPMs, a description of impacts, including direct, indirect, and cumulative, for each alternative, and mitigation measures, if appropriate. The chapter concludes with discussion of unavoidable/adverse impacts, short-term use versus long-term productivity, irreversible/irretrievable commitment of resources, and growth-inducing impacts.

Issues identified through public involvement and during scoping are an integral part of the environmental analysis. These scoping issues determine the depth and breadth of environmental analysis required for the project alternatives. Western uses a "sliding scale" approach when considering how detailed an analysis is appropriate for each resource. Resources that are susceptible to impacts from the construction, maintenance, or operation of a transmission line are given full evaluation, while resources where impacts would not occur or can be easily avoided by facility location or structure placement are addressed in less detail.

Environmental resource areas evaluated in detail for the Draft SEIS and EIR include:

- Air
- Biological resources
- Cultural resources
- Electric and magnetic fields
- Environmental justice
- Floodplains
- Geology
- Health and safety
- Land use
- Noise
- Paleontology
- Socioeconomics
- Soils
- Traffic
- Visual resources
- Water resources
- Wetlands

The Environmental Consequences section for each resource analyzes and explains the environmental changes that can be expected from implementing the alternatives, including the No Action alternative. This section forms the scientific and analytic basis for the Draft SEIS and EIR (Chapter 40 of the Code of Federal Regulations (40 CFR) 1502.14). It consolidates the discussions on those elements described in the Purpose and Need, public participation, and alternative development and comparison sections of the Draft SEIS and EIR (40 CFR 1502.16). SNR uses standard construction practices and has adopted EPMs to minimize impacts to the environment. Table 3-3 is a list of the EPMs appropriate to this SEIS and EIR. They are an integral part of SNR's construction specifications.

Environmental impacts can be positive (beneficial) or negative (adverse) as a result of the action (direct) or as a secondary (indirect) result, and can be permanent to long-lasting (long-term), or temporary or of short duration (short-term). For this analysis short-term impacts were generally assumed to occur from construction. Impacts can vary in degree or magnitude from no change, or only slightly detectable change, to a total change in the environmental condition or system once Western and participants have implemented the proposed Project. The assessment identifies impacts, evaluates impacts based on the standards of significance, evaluates applicable EPMs, and recommends mitigation measures if EPMs were insufficient to reduce an impact. Short-term construction and long-term disturbances from Project alternatives were calculated for sensitive habitats, floodplains, prime and unique farmland, and proposed development in Appendix B and disturbed acreage is presented in Table B-1.

To determine the levels or magnitude of potential impacts to the environment, Western has developed standards of significance for each resource. They include the following guidelines:

- **Resource Sensitivity:** the probable response of a particular resource to project-related activities.
- **Resource Quantity:** the amount of the resource potentially affected. The Draft SEIS and EIR quantifies impacted resources to determine the significance of the impact.

- **Resource Quality:** the present condition of the resource potentially affected.
- **Duration of Impact:** the period of time over which the resource would be affected, measured as short-term (up to five years or as defined by the resource section) or long-term (life of the project and beyond). The anticipated duration of some impacts define their significance.

Final site design for the transmission line and access roads is not complete. Therefore, Western analyzed impacts for this SEIS and EIR using several project assumptions. These assumptions are generally conservative and suggest more impact than would actually be realized by the proposed Project. For example, assumptions were made that access roads would be 15 feet wide and located along and within the entire length of the transmission line ROW. While permanent access is needed for each structure, some access roads to the structures may be spur roads from existing roads. Some structures may be located immediately adjacent to existing roads. Also, the extent possible, travel to and from construction activities would be by overland travel and simple roads and trails. The result is that total impacts for actual activities of the proposed Project would be reduced from those presented in this SEIS and EIR.

4.1 AIR QUALITY

4.1.1 Affected Environment

Air quality is regulated by Federal Environmental Protection Agency (EPA), state (California Regional Air Resources Board (CARB)) and local air districts. The Federal Clean Air Act (CAA) (42 U.S.C. §§ 7401- 7661, as amended) required EPA to establish National Ambient Air Quality Standards (NAAQS) (see 40 CFR Part 50). The NAAQS include both primary (protective of human health) and secondary (protective of property and natural ecosystems) standards for "criteria" pollutants such as ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and particulate matter less than 10 micrometers in diameter (PM_{10}). These pollutants are called "criteria" air pollutants because EPA has established standards for each pollutant to be controlled to meet specific public health and welfare criteria. Based on the NAAQS, EPA established criteria for designating the air quality in specific geographic regions. Regions with air pollutant levels that exceed NAAQS are designated as "nonattainment" and regions with air pollutant levels that are less than or equal to NAAQS are designated as "attainment." The State of California has adopted standards known as the California Ambient Air Quality Standards (CAAQS) that are typically more stringent than NAAQS. Table 4.1-1 presents a comparison of Federal and state standards.

EPA has final responsibility for ensuring that all areas of the United States meet, or are making progress toward meeting, the NAAQS. All states must submit State Implementation Plans (SIP) for nonattainment areas to demonstrate how they will meet NAAQS within the required time frame. CARB oversees the activities of regional and county air districts. Each air quality district prepares a portion of the SIP and EPA decides whether to approve the SIP. Each district is also responsible for establishing rules and implementation measures to regulate air quality. The districts accomplish this by developing permitting systems for existing, new, and modified stationary sources; monitoring air quality; and enforcing the rules, as necessary. Air districts are responsible for developing guidance to regulate emission sources; therefore, each district publishes emission thresholds. Projects with emissions of regulated pollutants that exceed district threshold levels are required to control emissions to the lowest extent possible. Because O_3 is a major pollutant of concern, air districts have emission thresholds for the precursor compounds that contribute to formation of O_3 in the atmosphere: nitrogen oxides (NO_x) and reactive organic gases (ROG), also referred to as volatile organic compounds (VOC). Examples of ROG/VOC are benzene, xylene, propane, and aldehydes. These thresholds are presented in Table 4.1-2.

The CAA requires Federal agencies to ensure that actions conform to the approved air quality implementation plans within federally designated nonattainment regions. EPA has established general conformity regulations (40 CFR Part 93, Subpart B) containing procedures and criteria for determining whether a proposed Federal action would conform to CAA implementation plans. General conformity rates applicable to the proposed Project, measured in tons per year, are presented in Table 4.1-2. EPA requires that projects with emissions that exceed general conformity rates adopt enforceable emission control measures that reduce applicable pollutant emissions to the maximum extent possible.

Table 4.1-1. Relevant Federal and California Ambient Air Quality Standards

Pollutant	Averaging Time	California AAQS[a,c]	National AAQS Primary[b,c,d]	National AAQS Secondary [b,c,e]
Ozone (O_3) [f]	1 hour	0.09 ppm (180 µg/m^3)	—	Same as Primary Standard
	8 hours	0.070 ppm (137 µg/m^3)	0.08 ppm (157 µg/m^3)	
Respirable Particulate Matter (PM_{10})	24 hours	50 µg/m^3	150 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	20 µg/m^3	50 µg/m^3	
Fine Particulate Matter ($PM_{2.5}$)[f]	24 hours	—	65 µg/m^3	Same as Primary Standard
	Annual Arithmetic Mean	12 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	8 hours	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide (NO_2)[g]	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary Standard
	1 hour	0.18 ppm (338 µg/m^3)	—	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	0.030 ppm (80 µg/m^3)	—
	24 hours	0.04 ppm (105 µg/m^3)	0.14 ppm (365 µg/m^3)	—
	3 hours	—	—	0.5 ppm (1,300 µg/m^3)
	1 hour	0.25 ppm (655 µg/m^3)	—	—
Visibility-Reducing Particles	8 Hours	Extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more when relative humidity is less than 70%.	—	—

Source: CARB 2007a

[a] Title 17, California Code of Regulations (CFR). California Ambient Air Quality Standards for O_3, CO, $S0_2$ (1- and 24- hour), NO_2, suspended particulate matter (PM_{10} and $PM_{2.5}$), and visibility-reducing particles are values that are not to be exceeded.

[b] 40 CFR Part 50. National Ambient Air Quality Standards, other than those for O_3, PM, and those based on annual averages, are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year, with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, is equal to or less than the standard.

[c] Concentrations are expressed first in units in which they were promulgated. Equivalent units are given in parentheses and based upon a reference temperature of 25ºC and a reference pressure of 760 torr. All measurements of air quality are to be corrected to a reference temperature of 25ºC and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] National Primary Standards: the levels of air quality necessary, with an adequate margin of safety to protect the public health

[e] National Secondary Standards: the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant

[f] The EPA promulgated new Federal 8-hour O_3 and $PM_{2.5}$ standards on July 18, 1997. The Federal 1-hour O_3 standard continues to apply in areas that violate the standard.

[g] NO_2 is the compound regulated as a criteria pollutant; however, emissions are usually based on the sum of all oxides of nitrogen or NO_x.

AAQS = Ambient air quality standards
mg/m^3 = Milligrams per cubic meter
ppm = Parts per million
µg/m^3 = Micrograms per cubic meter

Table 4.1-2. Sacramento Area Voltage Support Air District Status

Project Segments*	FRAQMD	PCAPCD	SMAQMD
SVS Project Air District Jurisdiction			
Alternative A1	X		X
Alternative A2	X		X
Alternative A3	X		X
Alternative A4	X		X
Alternative A5	X		X
Alternative B	X	X	X
Alternative C	X	X	X
O'Banion Substation	X		
Elverta/Natomas Substations			X
Ozone			
Federal Attainment Status	Serious Nonattainment (8-hour)	Serious Nonattainment (8-hour)	Serious Nonattainment (8-hour)
California Attainment Status	Serious Nonattainment (1-hour)	Serious Nonattainment (1- and 8-hour)	Serious Nonattainment (1- and 8-hour)
NO_x (Ozone Precursor)			
EPA General Conformity Threshold Rate	50 tons/year	50 tons/year	50 tons/year
Air District Construction Threshold Rate	25 lb/day	82 lb/day	85 lb/day
VOC/ROG (Ozone Precursor)			
EPA General Conformity Threshold Rate—VOC	50 tons/year	50 tons/year	50 tons/year
Air District Construction Threshold Rate—ROG	25 lb/day	82 lb/day	None
PM_{10}			
Federal Attainment Status	Moderate Nonattainment	Moderate Nonattainment	Moderate Nonattainment
California Attainment Status	Nonattainment	Nonattainment	Nonattainment
EPA General Conformity Threshold Rate	100 tons/year	100 tons/year	100 tons/year
Air District Construction Threshold Rate	80 lb/day	82 lb/day	50 $\mu g/m^3$

Source: Backus 2006, CARB 2006, EPA 2006, FRAQMD 2006, SMAQMD 2006.

* There is no appreciable difference in air emissions between the route option east vs. west of SR 99.

EPA = U.S. Environmental Protection Agency
FRAQMD = Feather River Air Quality Management District
lb/day = Pound per Day
NO_x = Nitrogen oxides
PCAPCD = Placer County Air Pollution Control District
ROG = Reactive organic gas
SMAQMD = Sacramento Metropolitan Air Quality Management District
SVS = Sacramento Area Voltage Support
PM_{10} = Particulate matter less than 10 micrometers in diameter
$\mu g/m^3$ = Micrograms per cubic meter
VOC = Volatile organic compound

4.1.1.1 Resource Study Area

Figure 4.1-1 shows the study area in relationship to the air districts. The study area is located within three air districts:

- Feather River Air Quality Management District (FRAQMD)
- Placer County Air Pollution Control District (PCAPCD)
- Sacramento Metropolitan Air Quality Management District (SMAQMD)

4.1.1.2 Issues of Environmental Concern

Issues of environmental concern for air quality would be short-term pollutant emissions related to vehicle exhaust and particulates generated by soil-disturbing activities during construction and maintenance. Table 4.1-2 presents construction emission thresholds, based on maximum daily emissions, for each air district.

4.1.1.3 Characterization

The study area experiences hot summers, mild winters, infrequent rainfalls, moderate breezes, and low humidity. Prevailing winds are southerly for all months except November, when the winds typically blow from the north. Topographical features, light winds and minimal vertical mixing hinder the dispersal of air pollutants in the study area. Temperature inversions trap pollutants near the ground and commonly elevate air pollutant levels. EPA and the state have designated the entire study area as an area of nonattainment for O_3 and PM_{10}. The study area is designated as attainment for all other regulated pollutants.

The CARB collects ambient air quality data through a network of air monitoring stations around the state. Tables 4.1-3 and 4.1-4 provide a summary of the air quality data collected from air monitoring stations nearest to the project in each of the affected counties. The Placer County data are from PCAPCD's Roseville monitoring station, the Sacramento County data are from SMAQMD's Airport Road monitoring station, and the Sutter County data are from FRAQMD's Yuba City monitoring station. The air monitoring data show that the area is consistently in violation of air quality standards.

4.1.2 Environmental Consequences

4.1.2.1 Standards of Significance

A significant effect on air resources would occur under the following conditions:

- Emissions would contribute to new violations of standards for ambient air quality.
- Emissions would increase the frequency or severity of existing violations.
- Emissions would delay timely attainment of standards.

The proposed Project's primary issues would be short-term pollutant emissions related to vehicle exhaust and particulates generated by soil-disturbing activities during construction and maintenance. Vehicles and internal combustion-powered equipment, such as graders, excavators, dozers, scrapers, tractors, water trucks, and associated equipment, would generate CO, NO_x, SO_2, VOC/ROG, PM_{10}, and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) exhaust emissions. Earth clearing, grading and traffic on the site also would generate PM_{10} and $PM_{2.5}$.

4.1.2.2 Environmental Protection Measures

EPMs for air resources from Table 3-3 include the following:

1. Western would adhere to all requirements of those entities having jurisdiction over air quality matters and obtain any permits needed for construction activities. Open burning of construction trash would not be allowed.
2. Project participants would use reasonably practicable methods and devices to control, prevent, and otherwise minimize atmospheric emissions or discharges of air contaminants.
3. Visible emissions from all off-road diesel-powered equipment would not exceed 40 percent opacity for more than 3 minutes in any 1 hour.
4. Equipment and vehicles that show excessive emissions of exhaust gases caused by poor engine adjustments or other inefficient operating conditions would not be operated until corrective repairs or adjustments were made.

Table 4.1-3 Summary of Local Ozone Data

County/ Year	Days Over Ozone Standard[a]		Maximum Concentration Recorded (ppm)	
	State 1-hour (0.09 ppm)	National 8-hour (0.08 ppm)	1-Hour	8-Hour
Placer County				
2006	16	9	0.121	0.097
2005	13	9	0.118	0.106
2004	5	1	0.106	0.085
2003	13	5	0.133	0.109
2002	21	11	0.131	0.105
Sacramento County				
2006	8	3	0.243	0.092
2005	4	1	0.100	0.087
2004	0	0	0.090	0.072
2003	2	1	0.097	0.085
2002	4	0	0.100	0.081
Sutter County				
2006	1	0	0.102	0.081
2005	0	0	0.092	0.073
2004	2	0	0.098	0.081
2003	0	0	0.090	0.079
2002	3	3	0.108	0.090

Source: CARB Board 2007b

[a] Generally, state and national standards are not to be exceeded more than once per year.

ppm = Parts per million

5. Vehicles and equipment used in construction and maintenance of the proposed Project or alternatives would maintain appropriate emissions control equipment and be appropriately permitted.
6. Road construction would include dust-control measures such as watering and other approved suppressing agents for limiting dust generation.
7. Fill material storage piles would include dust-control measures such as water or chemical suppressants.
8. Ground surfaces that have been significantly disturbed would be seeded appropriately to prevent wind dispersion of soil.
9. Removal of vegetation and ground disturbance would be limited to the minimum area necessary to complete proposed Project construction activities. Vegetative cover would be maintained on all other portions of the proposed Project area.
10. Regular watering of exposed soils and unpaved access roads would be conducted during the construction period.
11. Grading activities would cease during periods of high winds (greater than 20 miles per hour averaged over 1 hour).
12. Trucks transporting loose material would be covered or would maintain at least 2 feet of freeboard and not create any visible dust emissions.

Table 4.1-4. Summary of Local PM_{10} Data

	Estimated Days Over PM_{10} Standard[a]		Annual Average		High 24-Hour Average	
	National (150 µg/m^3)	State (50 µg/m^3)	National	State	National	State
Placer County						
2006	*	*	9.5	*	26	27
2005	0	5.8	19.1	19.6	55	58
2004	0	0	21.6	22.1	43	43
2003	0	6.1	21	21.3	58	59
2002	0	6.1	24.6	25.2	58	61
Sacramento County						
2006	*	*	10.9	*	39	52.2
2005	0	27.5	20.4	30.4	56	99.8
2004	0	0	19.6	20.5	47	87.1
2003	*	*	20.7	*	57	123
2002	0	24.5	15	26	144.8	73
Sutter County						
2006	*	*	6.3	*	32	34
2005	0	31.1	24.7	25	59	60
2004	*	*	17	*	53	53
2003	0	30.7	13	26.4	81	83
2002	0	24.5	15.5	31.8	74	75

Source: CARB 2007b

[a] Generally, state and national standards are not to be exceeded more than once per year.

* There was insufficient (or no) data available to determine the value

PM_{10} = Particulate matter less than 10 micrometers in diameter
ppm = Parts per million

13. Excessive engine idling will be minimized according to Placer County and City of Sacramento regulations.

14. A comprehensive inventory (e.g., make, model, year and emission rating) would be submitted to the relevant air districts of all the heavy-duty off-road equipment (50 horsepower or greater) that would be used in aggregate of 40 or more hours for the construction project. The inventory shall be updated and submitted monthly throughout the duration of the project, except that an inventory shall not be required for any 30-day period in which no construction activity occurs. At least 48 hours prior to the use of subject heavy-duty off-road equipment, the project representative shall provide the air districts with the anticipated construction timeline, including start date, name and phone number of the project manager and on-site foreman. Heavy-duty equipment would meet the standard emissions reduction of 20 percent NO_x and 45 percent PM_{10} compared to the most recent CARB fleet average at the time of construction.

4.1.2.3 Impacts from Alternatives

Impacts from alternatives would primarily be from construction emissions, including grading, site clearing, dust from traffic, digging and filling, and concrete operations. Western used established emission factors approved by Federal, state, and local agencies to estimate maximum proposed Project emissions from construction. Western used projected construction activities, typical equipment use (as presented in Table 3-2), and proposed

construction sequencing (as presented in Table 4.1-5) to estimate maximum construction emissions for each alternative. Western then compared maximum daily emissions, determined from the construction month having the highest emissions, against each district's applicable construction emission threshold. Activities among alternatives would be very similar and there would be no appreciable difference in air emissions between the route option east or west of SR 99. Substation upgrades would occur before or after transmission line construction and were not included in Table 4.1-5.

Table 4.1-5. Proposed Construction Sequencing for Emission Calculations

Line Section	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
1 (Segment 1)	ROW (gates and clearing)	Excavation, foundations	Steel haul-out, assembly, and structure erection	Stringing		Cleanup, revegetation
2 (Segment 1)	ROW (gates and clearing)	Excavation, foundations	Steel haul-out, assembly, and structure erection	Stringing		Cleanup, revegetation
3 (Segment 2)		ROW (gates and clearing), build new access roads	Excavation, foundations	Steel haul-out, assembly and structure erection	Stringing	Cleanup, revegetation
4 (Segment 2)		ROW (gates and clearing), build new access roads	Excavation, foundations	Steel haul-out, assembly and structure erection	Stringing	Cleanup, revegetation
5 (Segment 3)		ROW (gates and clearing)	Excavation	Foundations	Steel haul-out, assembly, structure erection, and stringing	Cleanup, revegetation, and steel haul-out

Source: Western 2007a

ROW = Right of Way

Assumptions for Emission Calculations:

Assume dividing project into five sections (approximately 20% of project length - 8 miles each)
Assume starting at the north and working south (starting at Segment 1)
Assume PM_{10} fugitive dust from access road construction occurs in Month 2
Assume one foundation per day
Assume maximum of 1 mile of access road constructed per day = 1.8 acres disturbed/day in road construction = 9 lbs/day PM_{10} from Sacramento Metropolitan Air Quality Management District Road Construction Model Version 5.2

Many air districts differentiate between construction and operational emissions, recognizing that construction emission impacts are short-term and operational impacts are long-term. Estimated emissions are based on construction activities and are compared to each air district's construction emission threshold. As presented in Table 4.1-6, NO_x would exceed emission thresholds for all alternatives. Emissions from ROG are below emission thresholds for all districts. Emissions for PM_{10} are below emission thresholds for FRAQMD and PCAPCD. Emissions for PM_{10}, as predicted in pounds per day (lb/day), do not directly correlate to SMAQMD's concentration-based threshold of 50 micrograms per cubic meter ($\mu g/m^3$). SMAQMD recognizes that most PM_{10} emissions from this type of construction operations are caused by ground-disturbing operations. By limiting the area of ground disturbed daily and following Western's EPMs, PM_{10} emissions would not be considered significant by SMAQMD.

Monthly and total project direct emissions are presented in Table 4.1-7. The results are presented for Alternative C, which would have the highest emissions based on length and access roads. All alternatives would have maximum ROG and NO_x

Table 4.1-6 Daily Emission Comparison

Maximum Daily Emissions			
	Pollutant (lb/day)		
Alternative	**ROG**	**NOx**	**PM_{10}**
A1	16.4	114.2	12.1
A2	16.4	114.2	12.1
A3	16.4	114.2	12.1
A4	16.5	115.7	12.1
A5	16.3	113.4	12.0
B	16.3	113.0	12.0
C	16.7	119.1	12.2
O'Banion Substation*	3.0	21.0	0.6
Elverta/Natomas Substation*	2.2	13.1	0.4
Air District Emission Thresholds			
	Pollutant (lb/day)		
District	**ROG**	**NOx**	**PM_{10}**
FRAQMD	25	25	90
PCAPCD	82	82	82
SMAQMD	none	85	50 µg/m^3

Source: Western 2007a

* Substation upgrades would not be concurrent with transmission line construction.

FRAQMD = Feather River Air Quality Management District

NO_x = nitrogen oxides
lb/day = Pounds per day
PCAPCD: Placer County Air Pollution Control District
PM_{10} = Particulate matter less than 10 micrometers in diameter
ROG = Reactive organic gas
SMAQMD = Sacramento Metropolitan Air Quality Management District
µg/m^3 = Micrograms per cubic meter

Table 4.1-7 Monthly and Total Project Emissions

Month	Pollutant (lb/month)		
	ROG	**NOx**	**PM_{10}**
Month 1	50	296	9
Month 2	336	2,661	303
Month 3	396	2,957	85
Month 4	353	2,757	83
Month 5	248	1,626	51
Month 6	167	1,003	32
O'Banion Substation*	75	524	16
Elverta/Natomas Substation*	54	327	10
Project Total (lbs)	1,679	12,151	589
Project Total (tons)	0.8	6.1	0.3
EPA Conformity Threshold (tons/year)	50	50	100

Source: Western 2007a

* Substation upgrades would not be concurrent with transmission line construction.

ROG: Reactive organic gas
NO_x: Nitrogen oxides
EPA: U.S. Environmental Protection Agency
Emissions are calculated for Alternative C.
lb/month: pounds per month
PM_{10}: Particulate matter less than 10 micrometers in diameter

emissions in Months 3 and 4, during foundation pouring, resulting from maximum equipment present. All alternatives would have maximum PM_{10} emissions during access road construction in Month 2. Substation upgrades would not exceed emission thresholds. Total proposed Project emissions, however, are less than EPA conformity thresholds; therefore, a conformity determination is not required.

While implementation of EPMs would reduce NO_x, PM_{10}, and ROG emissions to the maximum extent practical, NO_x emissions still could exceed the districts' threshold values. Because of the linear nature of the proposed Project, construction emissions would be sporadic and spread over the proposed Project area. Emissions would not be expected to contribute to new violations of standards for ambient air quality, or increase the frequency or severity of existing violations. Emissions would not be expected to contribute to local air districts attainment of standards. Western has adopted a proactive stance by implementing EPMs that mirror measures recommended by the air districts. Therefore, the project would comply with air district requirements.

Western expects that NO_x, PM_{10}, and ROG emissions would actually be less than the estimated emissions presented in this SVS SEIS and EIR. The assumptions made in calculations assume the maximum daily equipment usage, based on a worst-case scenario. These maximum emissions do not include use of EPMs that would reduce emissions. Emission calculations are found in Western's *Estimated Emissions for the Sacramento Area Voltage Support Supplemental Environmental Impact Statement and Environmental Impact Report Project and Alternatives* (Western 2007a).

4.1.2.4 Impacts from the No Action Alternative

Transmission lines would not be constructed under the No Action Alternative. Therefore, air emissions would not increase and no significant impacts would occur from construction.

4.1.2.5 Cumulative Impacts

The Sacramento Valley is shaped like a bowl, contributing to the inversion layer that traps pollutants close to the ground, causing unhealthy air quality levels. Currently, vehicles and other mobile sources, including trucks, trains, buses, motorcycles, and agricultural and construction equipment, cause approximately 70 percent of the region's air pollution problem.

Past and present land use in the proposed Project area has been primarily agricultural. Agricultural operations contribute primarily to PM_{10} emission violations of NAAQS and CAAQS in the area from ground disturbances and rice burning. The Connelly-Areias-Chandler Rice Straw Burning Reduction Act of 1991 mandated that rice straw burning in the Sacramento Valley be phased down starting in 1992. Rice burning currently is allowed only under specified conditions for disease control.

Future planned development may change the proposed Project area from agricultural to residential, commercial, and industrial development uses. This shift in land use will change emissions to primarily vehicular exhaust and industrial emissions (ROG, CO, and NO_x).

Total maximum proposed Project emissions would contribute less than 0.1 percent to the annual emissions inventory for the Sacramento region. Construction and vehicular emissions, while meeting air district requirements, would still cause a small increase in O_3 precursor emissions, resulting in a minor direct, temporary adverse effect.

An increase in vehicular emissions from future development and population growth would have an indirect, permanent adverse impact on the air quality in the Sacramento Region. However, continued efforts from CARB and local air districts; mitigation measures, including use of best available control technology; and lower-emission vehicles may help to lower the impacts from emissions.

The proposed Project's contribution to foreseeable regional air emissions, as presented above for O_3, is not expected to be considerable. The conversion of farmland to development would result in a reduction in PM_{10} emissions from the decrease in ground disturbances and rice burning. All foreseeable projects would have to undergo local air district review and follow their mitigations; therefore, no significant cumulative air quality impacts would occur.

4.1.2.6 Impacts Summary

While minor differences exist in emission levels among the alternatives, no significant direct, indirect, or cumulative impacts would occur for air quality from any alternative.

4.2 BIOLOGICAL RESOURCES

4.2.1 Affected Environment

The biological resources section focuses on plant and animal species' habitats within the proposed study area. Biological resources were evaluated by reviewing existing literature, discussing species-specific information with agencies, and conducting surveys of the study area. Biological surveys were completed to assist in determining the presence of the plants, animals, and habitats that Federal and state resource management agencies consider deserving of special consideration in resource planning and development activities. Meandering pedestrian surveys were conducted systematically down each segment by 2 to 4 qualified biologists. Wildlife observations and habitat characterizations, including a wetland assessment, were recorded. Indications of wildlife presence were noted, including direct sightings, scat, tracks, burrows, and other signs. Vegetation communities were characterized in the field and mapped on aerial photographs. Surveys were restricted to areas with right-of-entry. Segments 1 and 2A were surveyed during one week in December 2005, one and a half weeks in January, two weeks in February, and one week in March 2006. Segments 2A, 2B, 2C, and 3 were surveyed during one week in August, September, and October 2006, respectively. The Segment 2A route option west of Highway 99 was surveyed during two days in April 2007. Of the 117 alternative ROW miles, 36 miles were not surveyed because right-of-entry was not granted from land owners. These areas were assessed from adjacent roadways and aerial photographs. Table D-1 in Appendix D summarizes observed habitat within the study area.

4.2.1.1 Resource Study Area

The study area for biological resources is defined as transmission line Segments 1, 2A1, 2A2, 2A3, 2A4, 2A5, 2B, 2C, and 3 from O'Banion Substation to Natomas Substation with a 125-foot ROW and a 500-foot buffer (see Maps C-1 to -12 in Appendix C). In some cases, the survey width extends beyond the proposed buffer if biological resources of concern could be impacted.

4.2.1.2 Issues of Environmental Concern

Issues of environmental concern include areas of designated critical habitat, essential fish habitat, special-status wildlife and plants, and sensitive habitat types, as well as non-threatened or endangered species and habitat. These issues are described in detail below.

Designated Critical Habitat

Critical habitat was identified as an issue of concern by both EPA and the U.S. Fish and Wildlife Service (USFWS). Critical habitat is defined in 50 CFR 424.02 as "the specific areas within the geographic area currently occupied by a species, at the time it is listed in accordance with the *Federal Endangered Species Act* (ESA) of 1973 (16 U.S.C. §§ 1531-1599), on which are found those physical or biological features essential to the conservation of the species and that may require special management considerations or protection." Either USFWS or the National Marine Fisheries Service (NMFS) may designate critical habitat.

Essential Fish Habitat-Magnuson-Stevens Fisheries Conservation and Management Act

The *Magnuson-Stevens Fisheries Conservation and Management Act* (MSA) (16 U.S.C. §§1801, *et seq*.), as amended, established procedures intended to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a fisheries management plan. Furthermore, the act provides that Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.

Special-Status Wildlife and Plant Species

Special-status species are those plants and animals that are of concern to Federal, Tribal, and state resource management agencies. Special-status species that may occur in the study area were identified by searching the California Department of Fish and Game (CDFG) California Natural Diversity Database (CNDDB) and from correspondence with USFWS and NMFS (refer to Appendix D for the CNDDB results and agency letters). The CNDDB was searched for each U.S. Geological Survey (USGS) 7.5-minute quadrangle within the study area. Special-status species that are likely to occur in the Project study area, include California or federally listed, proposed and candidate species; species afforded protection under the Fish and Game Code of California; Federal and CDFG "Species of Special Concern"; highest and second priority lists;

and California Native Plant Society (CNPS) Lists 1-3.

Sensitive Habitat Types

Wetlands, including vernal pools, freshwater emergent (a plant that is rooted below the water but has foliage that extends above the water level) wetlands, riparian corridors (habitat or areas, usually adjacent to rivers, streams, or lakes, where the vegetation and microclimate are heavily influenced by water), and slow-moving canals with emergent marsh and woody riparian vegetation are habitats of concern within the study area. Vernal pools occur seasonally in landscape depressions where there is a layer of hardpan under the soil that prevents water from draining. Vernal pools provide habitat for a number of protected, endangered, threatened, proposed, and candidate species that have adapted to periodic inundation. These include several species of vernal pool fairy and tadpole shrimp, as well as rare endemic plants.

Freshwater emergent wetlands are dominated by rooted herbaceous hydrophytes. These plants are typically perennial (lasting two seasons or more) and can tolerate water at their base, but they cannot survive long periods in which they are completely submerged. Freshwater emergent wetlands are important habitats for feeding, nesting, spawning, and resting cover for fish and wildlife, including many rare and endangered species. The presence of freshwater wetlands in a watershed helps reduce flood damage by slowing and storing flood water and can act as a sink (a place in the environment where a compound or material collects) for pollutants, thus preserving the quality of surface waters.

Riparian corridors contain plant species that are considered mesophytic (a plant that tolerates both dry and wet conditions). These include cottonwood (*Populus* sp.), willow (*Salix* sp.), sycamore (*Platanus* sp.), and other herbaceous and woody vegetation. Riparian corridors are sensitive because of their proximity to aquatic systems. Ground disturbance in riparian corridors can lead to erosion and the subsequent increase in sedimentation that would decrease water quality in these areas and downstream. Plant roots help anchor and stabilize soil, and aboveground riparian vegetation provides resistance to flood water, thereby lessening the adverse effects of flooding (Darby 1999). Removal of vegetation within riparian corridors could, therefore, increase the adverse effects of flooding.

4.2.1.3 Characterization

The following section presents a characterization of habitat types, critical habitat, and plant and animal species found in the study area. Each segment within the study area is then described based on these habitat types.

Habitat Types and Associated Plant Species

Eleven different habitat types occur within the study area. In general, habitat types were categorized based on *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986). Riverine, lacustrine, pasture, cropland, orchard/vineyard, and urban habitat types, which could not be categorized using Holland (1986), were categorized based on *A Guide to Wildlife Habitats of California* (Mayer and Laudenslayer 1988). Brief descriptions of these habitat types and associated plant species are provided below and are included in Appendix C (see Maps C-1 to -12).

- ***Cropland –*** Cropland habitat is typically a monoculture; that is, a single species growing in a given space. Most croplands support annuals planted in spring and harvested during summer or fall. In many areas, second crops are commonly planted after the first are harvested (Zeiner 1988a). Cropland present within the study area includes row crops, pasture, and grain crops. A major portion of the cropland in the study area is used for rice fields, which provide habitat for waterfowl and the giant garter snake, because they are flooded.
- ***Freshwater emergent wetland –*** These wetlands are characterized by erect, rooted, herbaceous hydrophytic (water-loving) vegetation. Dominant plants are generally perennials up to 7 feet high (Cowardin, *et al.* 1979). Freshwater emergent wetlands are flooded frequently and the plants found there must be able to tolerate an absence of oxygen (anaerobic environment) around their roots. Additional detail regarding this habitat type is provided in Sections 4.6 and 4.17, which address floodplains and wetlands, respectively.
- ***Great Valley Cottonwood Riparian Forest –*** This habitat type is a dense, broad-leaved, deciduous (plants that shed their leaves at the end of the growing season) riparian forest dominated by Fremont cottonwood (*Populus fremontii*) and Gooddings willow (*Salix*

gooddingii variabilis). The understory is dense, with abundant reproduction of canopy-dominant species. California wild grape (*Vitis californica*) is the most conspicuous vine. Scattered seedlings of shade-tolerant species, such as box-elder (*Acer negundo californica*) or Oregon ash (*Fraxinus latifolia*), may be found within this riparian forest, but frequent flooding prevents their reaching into the canopy (Holland 1986).

- ***Great Valley Riparian Scrub –*** This shrub-dominated habitat type is characterized as an open-to-dense, broadleaved, winter-deciduous streamside thicket dominated by any of several willow (*Salix)* species, including narrow-leafed willow (*Salix exigua*), red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), Goodding's black willow (*Salix gooddingii variabilis)*, California button willow (*Salix* sp.), as well as blue elderberry (*Sambucus Mexicana*), verbena (*Verbena* sp.), and Himalayan blackberry (*Rubus discolor*). This habitat is widespread along major rivers and smaller streams throughout the Great Valley watershed, usually below 1,000 feet in elevation (Holland 1986).
- ***Lacustrine –*** Lacustrine habitats are inland depressions or dammed riverine channels containing standing water. They may vary from small ponds of less than 2 acres to large areas covering several square miles. Depth can vary from a few inches to hundreds of feet. Lacustrine habitats include permanently flooded lakes and reservoirs, intermittent lakes, and ponds (Grenfell 1988a). Ponds are the main lacustrine habitat type in the study area.
- ***Non-native Grassland –*** A dense-to-sparse cover of annual grasses (plants that germinate, mature, set seed, and die in 1 year) typifies this habitat type. It is often associated with numerous species of showy-flowered, native annual forbs ("wildflowers"), especially in years of favorable rainfall. Germination occurs with the onset of the late fall rains; growth, flowering, and seed-set occur from winter through spring. With few exceptions, the plants are dead through the summer-fall dry season, persisting as seeds (Holland 1986).
- ***Orchard/Vineyard –*** Orchards are typically single-species, tree-dominated habitats. Depending on the tree type and pruning methods, they may be low bushy trees or taller species with a closed canopy. Both have an open understory to facilitate harvest. Vineyards are composed of single species planted in rows, usually supported on wood and wire trellises. Vines are normally intertwined in the rows but are open between rows. The ground under the vines is usually sprayed with herbicide to prevent growth of unwanted plants (Schultze 1988).
- ***Pasture –*** Pasture vegetation is usually a mix of annual and perennial grasses and legumes that normally provide nearly 100 percent ground cover. The mix of grasses and legumes varies according to management practices, such as seed mixture, fertilization, soil type, irrigation practices, weed control, and livestock type on the pasture (Zeiner 1988b).
- ***Riverine –*** Riverine habitats are intermittent or continually running water, such as rivers and streams (Grenfell 1988b). Within the study area, riverine habitats vary from large rivers, such as the Feather River, to intermittent streams, such as Coon Creek.
- ***Urban –*** The structure of urban vegetation varies with the following five types of vegetative structure: tree grove, street strip, shade tree/lawn, lawn, and shrub cover. Tree groves are common in city parks, greenbelts, and cemeteries. Strips of trees along streets show variation in spacing of trees, depending on the species, design and landowner preferences. Lawns are structurally the most uniform vegetation of the California urban habitat. Shrub cover is more limited in distribution than the other structural types; hedges represent a variation of the urban shrub cover type. Species composition varies with planting design and climate (McBride and Reid 1988).
- ***Vernal Pool –*** Vernal pools consist of grass- or mud-bottomed swales, earth sumps, or basalt flow depression pools in unplowed grasslands (USFWS 1992) with an impermeable layer. The impermeable layer allows the pools to retain water much longer than the surrounding uplands; nonetheless, the pools are shallow enough to dry up each season. Vernal pools may fill and empty several times during the rainy season (California Environmental Resources Evaluation System 2007). This habitat type is important in the Central Valley of California because only plants and animals that are adapted to this cycle of wet

and dry can survive in vernal pools. A number of protected plant and animal species rely on vernal pool habitats, resulting in special management consideration.

The following section presents critical habitat and special-status wildlife species that may occur in the study area.

Critical Habitat

Within the study area, NMFS has designated critical habitat for Central Valley spring-run chinook salmon and Central Valley steelhead that are known to occur within USGS Hydrologic Units 5519, 5520, 551922, and 552030, which contain the Sacramento River, Feather River, Sutter Bypass, and Nelson Slough. Additionally, these hydrologic units, plus Coon Creek, Cross Canal, and Natomas East Main Drainage Canal, are designated as critical habitat for the Central Valley steelhead (70 FR 52590 and 52604-52605).

Essential Fish Habitat

The study area is within the Central Valley Evolutionary Significant Unit (ESU) for Central Valley steelhead as well as the Central Valley ESU for fall/late-run and fall/spring-run chinook salmon. NMFS has designated waterbodies within the study area as EFH. The Sutter Bypass, Feather River, Coon Creek, Cross Canal, and Natomas East Main Drainage Canal have been designated as EFH for Pacific salmon.

Sensitive Habitat

Sensitive habitats are areas in which the plants, wildlife, or the habitat itself is either rare or especially valuable and any area which meets one of the following criteria: (1) contains or supports rare and endangered species, (2) contains breeding or nesting sites or is used by migratory and resident water-associated birds for resting and/or feeding, (3) existing game and wildlife refuges and reserves, (4) lakes and ponds and adjacent habitat, and (5) all perennial and intermittent streams and their tributaries, and (6) marshes and sloughs. Sensitive habitat includes, but is not limited to, riparian corridors, wetlands, riverine habitats, and habitats supporting rare, endangered, and unique species.

Segment Characterization

The following is a discussion of each segment by general habitat, sensitive habitat, and critical habitat. It also includes information on vegetation, wildlife, and special-status species that may be present in the segment. Table D-2 in Appendix D contains the special-status species that may be present.

4.2.1.4 Segment 1

Habitat

Segment 1 is parallel and adjacent to the Sutter Bypass. It crosses cropland, primarily rice fields, with associated irrigation ditches and canals. The segment crosses Gilsizer Slough from MP 1.3 to 1.8, Nelson Slough at MP 10.9, Feather River at MP 11.0 to 11.5, Coon Creek at MP 13.2, and Bunkham Slough at MP 15.6 (see Maps C-1 to -5 in Appendix C).

Sensitive and Critical Habitat

Segment 1 has four water crossings (Gilsizer Slough, Feather River, Coon Creek, and Bunkham Slough, which are critical habitat), totaling approximately 8.2 acres of riverine and riparian habitat (see Maps C-1 to -5 in Appendix C). Additionally, the segment crosses a total of 8.0 acres of freshwater emergent wetlands (further described in Section 4.16). Segment 1 parallels the Sutter Bypass, which is critical habitat, for about 9 miles. Sutter Bypass is a floodwater bypass of the Sacramento River that floods about once a year. From MP 1.3 to 1.8, the segment crosses Gilsizer Slough, a designated Fish and Game Code Significant Area (see Map C-1 in Appendix C). Gilsizer Slough is an engineered channel that begins in Yuba City and drains into the State Drain, which carries drainage water to the O'Banion Pumping Station. At about MP 11.0, the ROW encounters Nelson Slough, which is critical habitat, and the north levee of the Feather River floodplain. This portion of Segment 1 is located in the Nelson Slough Unit of the Feather River Wildlife Area, which is 1 of 108 state-owned wildlife areas designated as open space to protect and enhance habitat for wildlife species and to provide the public with wildlife-related recreational areas. The floodplain associated with the river is approximately 0.5 mile wide. Three mature elderberry shrubs were located within the Riparian Forest floodplain. Coon Creek and Bunkham Slough watersheds run through Blue Oak Woodland, Foothill Pine, and Valley Oak habitats. These drainages provide irrigation water to adjacent fields and ultimately feed the Sacramento River.

Plants and Wildlife

Vegetation in Nelson Slough includes valley oak, willows, cottonwood, blackberry, and elderberry. The Lower Feather River provides important breeding and migratory stopover habitat for numerous songbird species and has high potential for range expansion of riparian birds (RHJV 2004). Several species of birds were noted during field surveys on and around the existing transmission line structures along the entire segment length. These included great egret, American crow, red-tailed hawk, great blue heron, and American white pelican. Within the proposed Project area, Gilsizer Slough and the Feather River provide habitat and foraging grounds for waterfowl, migrating birds, and other wildlife species. Coon Creek provides rearing habitat for juvenile steelhead in the summer and spawning and rearing habitat for steelhead and chinook in other months of the year.

Special-Status Wildlife and Plant Species

Sutter Bypass, Feather River, and Coon Creek provide habitat for Central Valley spring-run chinook salmon and Central Valley steelhead and migratory birds. Gilsizer Slough, Nelson Slough, and Bunkham Slough are important freshwater emergent wetlands, which provide habitat for the giant garter snake, northwestern pond turtle, and resident tricolored blackbird. Great Valley Riparian Forest and riverine habitat along the Feather River provide habitat for the Swainson's hawk, bank swallow, and Aleutian Canada goose in the summer.

4.2.1.5 Segment 2A

Habitat

The first 0.7 mile of Segment 2A (including 2A1, 2A2, 2A3, 2A4, and 2A5) parallels Cross Canal, a man-made canal that supports emergent marsh and woody riparian vegetation similar to that found along natural waterways. Cross Canal is a perennial tributary of the Sacramento River (see Map C-5 in Appendix C). On the south side of Cross Canal, Segment 2A parallels Highway 99 along an east or west route option through rice fields to one of five alternative routes between Riego Road and Elkhorn Boulevard. Segments 2A1, 2A2, and 2A5 parallel the Natomas East Main Drainage Canal, which ultimately flows to the Sacramento River. This canal contains isolated pockets of willow and emergent marsh vegetation and provides habitat for the burrowing owl, giant garter snake, Swainson's hawk, and Central Valley steelhead. All alternatives contain irrigation ditches and canals associated with rice fields, freshwater emergent marsh, and seasonal wetlands and vernal pools.

Sensitive and Critical Habitat

Segment 2A alignments traverse between 1.7 and 2.7 acres of riparian habitat and between 0.8 and 6.0 acres of vernal pools (see Table B-1 in Appendix B). At MP 0.7, Segment 2A traverses Cross Canal, which is critical habitat. The slow-moving canal with emergent marsh and woody riparian vegetation, including willow and cottonwood, provides habitat for the giant garter snake, northwestern pond turtle, steelhead, chinook salmon, and Swainson's hawk.

Segment 2A1 crosses Riparian Great Valley Scrub at MP 9.5 and seasonal wetlands at MP 10.0. Segments 2A1, 2A2, and 2A5 cross isolated seasonal wetlands between about MP 11.0 and the end (see Map C-9 in Appendix C).

Segment 2A2 crosses a freshwater marsh complex between MP 8.3 and 9.3, which is a habitat mitigation bank, and freshwater marsh with riparian vegetation between MP 9.4 to 9.6 (see Maps C-7 and -9 in Appendix C).

Segment 2A3 crosses isolated vernal pools and vernal pool grassland from MP 11.1 to 11.9 (see Map C-10 in Appendix C).

Segment 2A4 crosses three isolated seasonal wetlands between MP 13.0 and 13.3 (see Map C-10 in Appendix C).

Segment 2A5 crosses isolated seasonal wetlands between MP 11.2 to 11.8 (see Map C-9 in Appendix C).

Plants and Wildlife

Vegetation in Cross Canal includes valley oak, cottonwood, willows, and blackberry. Mammals observed in the vicinity of Segment 2A include the California ground squirrel, Western grey squirrel, and field mouse. Cross Canal and the Natomas East Main Drainage Canal provide foraging and loafing habitat for waterfowl, migrating birds, and other wildlife species.

Special-Status Wildlife and Plant Species

The freshwater emergent marsh associated with Cross Canal supports isolated pockets of willow, emergent marsh vegetation, and open water. This

area provides habitat for wading birds, giant garter snakes, northwestern pond turtles, Central Valley steelhead, and Swainson's hawk. Rodent burrows on the upper banks of Cross Canal provide suitable habitat for burrowing owls. The seasonal wetlands crossed by Segments 2A1, 2A2, and 2A5, adjacent to the Natomas East Main Drainage Canal, provide habitat for California linderiella and vernal pool fairy shrimp (see Map C-9 in Appendix C). The Natomas East Main Drainage Canal provides habitat for the giant garter snake, Swainson's hawk, and Central Valley steelhead. Rodent burrows on the banks of the canal provide suitable habitat for the burrowing owl.

4.2.1.6 Segment 2B

Habitat

Segment 2B traverses Cross Canal, non-native grassland, rice fields, pasture, agricultural and grain fields, and five streams (Pleasant Grove Creek at MP 2.6, Curry Creek at MP 3.1, two perennial creeks at MP 5.2 and 8.2, and an intermittent creek at MP 8.6), totaling approximately 2.6 acres of riverine and riparian habitat (see Maps C-5, -6, -8, and -9 in Appendix C). The alignment parallels Pleasant Grove Creek Canal from MP 0.3 to 3.9. This is a man-made canal that extends south from Cross Canal, and supports freshwater emergent marsh vegetation.

Sensitive and Critical Habitat

Segment 2B crosses approximately 2.6, 7.9, and 11.4 acres of riparian habitat, vernal pools, and emergent wetlands, respectively. The segment traverses Cross Canal, which is critical habitat, with associated emergent marsh and woody riparian vegetation, near MP 0.1. The alignment follows Natomas Road along the Pleasant Grove Creek Canal and associated freshwater marsh from MP 0.3 to 4.5. The canal extends south from Cross Canal; Pleasant Grove and Curry creeks feed the canal, which then flows into the Natomas East Main Drainage Canal, which is critical habitat. A few scattered vernal pools and seasonal wetlands are present near MP 3.7. Between MP 4.5 and 7.5, the segment crosses scattered vernal pools and wet meadows (open prairie or grassland with waterlogged soils, but without standing water for most of the year). From MP 7.5 to 9.0, Segment 2B parallels two existing transmission lines that cross non-native grassland with vernal pools, seasonal wetlands, and a perennial creek at MP 8.2.

Plants and Wildlife

Vegetation observed in Cross Canal, Pleasant Grove Creek, and Curry Creek includes valley oak, cottonwood, willows, and blackberry. The two unnamed perennial creeks crossed by this segment contain willows, blackberry, and emergent vegetation; the unnamed intermittent creek contains annual grasses. These creeks provide habitat for migrating birds and other wildlife species. Non-native grasses are present throughout several portions of the segment. Mammals found in the vicinity of Segment 2B include the California ground squirrel, Western grey squirrel, and field mouse.

Special-Status Wildlife and Plant Species

Cross Canal provides habitat for the giant garter snake, northwestern pond turtle, steelhead, chinook salmon, and Swainson's hawk. The Pleasant Grove Creek Canal supports pockets of willow, emergent marsh vegetation, and open water, providing habitat for wading and migratory birds, giant garter snake, northwestern pond turtle, and Swainson's hawk. Burrowing owls were observed within the ROW at MP 3.5 and about 150 feet west of MP 3.6. A resident individual and possibly a pair were detected. Active burrows in the area were inspected and recorded. The vernal pools between MP 4.5 and 7.5 provide suitable habitat for vernal pool fairy shrimp and California linderiella. The perennial creeks at MP 5.2 and 8.2, and Curry Creek at MP 3.1 are slow-moving and support emergent marsh vegetation, providing habitat for the giant garter snake, tricolored blackbird, and northwestern pond turtle.

4.2.1.7 Segment 2C

Habitat

Segment $2C_1$ traverses Cross Canal and five stream crossings (Pleasant Grove Creek at MP 2.5, Curry Creek at MP 3.9, two perennial creeks at MP 5.9 and 8.7, and an intermittent creek at MP 9.1). From MP 0.2 to 6.7, the alignment crosses row crops and rice fields, with associated irrigation ditches, canals, and wetlands (see Maps C-5, -6, -8, and -9 in Appendix C). The alignment crosses predominantly non-native grassland from MP 6.1 to the end.

Segment $2C_2$ predominantly crosses rice fields, agricultural fields, and non-native grassland. This alignment has two stream crossings (Curry Creek at MP 5.0 and an intermittent creek at MP 5.7) and 9.0 acres of natural and manmade wetlands. The wetlands include emergent marsh, seasonal wetlands,

canals, ditches, and vernal pools (see Map C-12 in Appendix C).

Sensitive and Critical Habitat

Segment C crosses approximately 1.4 acres of riparian habitat, 8.6 acres of vernal pools, and 2.7 acres of emergent wetlands. The first 0.2 mile of Segment $2C_1$ traverses Cross Canal, which is critical habitat, and associated emergent marsh. Cross Canal is a slow-moving a man-made canal that supports emergent marsh and woody riparian vegetation similar to that found along natural waterways, including willow and cottonwood. This canal provides habitat for the giant garter snake, northwestern pond turtle, steelhead, chinook salmon, and Swainson's hawk. Pleasant Grove and Curry creeks support emergent marsh and large woody riparian vegetation. From MP 6.7 to 8.0, the alignment crosses sections of urban development and pastureland, with isolated vernal pools and seasonal wetlands. The two unnamed perennial creeks crossed by this segment contain willows, blackberry, and emergent vegetation. These creeks provide habitat for migrating birds and other wildlife species. From MP 8.0 to 9.1, Segment $2C_1$ parallels existing transmission lines that cross pastures with vernal pools and an intermittent creek at MP 9.1, which contains annual grasses.

Segment $2C_2$ crosses rice fields, with a few small, isolated vernal pools and seasonal wetlands in 4.9 miles (see Map C-12 in Appendix C). A pheasant hunting club is located near MP 3.0. The transmission line parallels the western edge of the West Roseville Specific Plan (WRSP) Open Space Preserve between MP 3.9 and 4.9. This preserve consists of several habitat types, including non-native grasslands, vernal pools, and riparian/oak woodland corridors. From MP 4.9 to 5.5, the alignment traverses agricultural land to the west and pastures with vernal pools and seasonal wetlands to the east and crosses a branch of Curry Creek at MP 5.0. At MP 5.5, the entire ROW consists of non-native grasslands with isolated vernal pools and seasonal wetlands, including a high density of vernal pools just before the alignment intersects the existing transmission line. The vernal pools provide suitable habitat for vernal pool fairy shrimp and California linderiella.

Plants and Wildlife

Vegetation in Cross Canal, Pleasant Grove Creek, and Curry Creek includes valley oak, cottonwood, willows, and blackberry. The perennial creeks crossed by Segment $2C_1$ at MP 5.9 and 8.7 supports emergent marsh vegetation. These creeks and canal provide habitat and foraging grounds for waterfowl, migrating birds, and other wildlife species.
Non native grasses dominate several portions of the segments. Mammals observed in the vicinity of Segments $2C_1$ and $2C_2$ include the California ground squirrel, Western grey squirrel, and field mouse. Bird species noted during field surveys include the great egret, American crow, red-tailed hawk, and great blue heron.

Special-Status Wildlife and Plant Species

Segment $2C_1$ crosses Pleasant Grove and Curry creeks, which are slow-moving and support emergent marsh vegetation and large woody riparian species, providing habitat for the giant garter snake, tricolored blackbird, Swainson's hawk, and northwestern pond turtle. The perennial creeks at MP 5.9 and 8.7 are slow-moving and support emergent marsh vegetation, providing habitat for the giant garter snake, tricolored blackbird, and northwestern pond turtle.

Segment $2C_2$ parallels the western edge of the WRSP Preserve, which provides habitat for several special status species and a variety of more common wildlife species. Segment $2C_2$ crosses isolated vernal pools between MP 5.5 and 6.3, including a high density complex just before the alignment intersects the existing transmission line, that provide suitable habitat for dwarf downingia, vernal pool fairy shrimp, and California linderiella. The alignment crosses Curry Creek which provides habitat for the giant garter snake, tricolored blackbird, and Swainson's hawk.

4.2.1.8 Segment 3

Habitat

The first 0.7 mile crosses non-native grassland with isolated seasonal wetlands. Segment 3 crosses the Natomas East Main Drainage Canal at MP 0.8. The rest of the segment crosses non-native grasslands with some seasonal wetlands and agricultural lands (see Map C-10 in Appendix C).

Sensitive and Critical Habitat

Segment 3 crosses about 3.2 acres of vernal pools and 0.1 acre of emergent wetlands. A freshwater marsh is located at MP 0.2 that provides habitat for the giant garter snake, tricolored blackbird, and

northwestern pond turtle. The alignment crosses seasonal wetlands between MP 0.2 and 1.0. At MP 0.8, the alignment crosses Natomas East Main Drainage Canal, which is critical habitat. The canal extends south from Pleasant Grove Creek Canal, merges with Arcade Creek, and flows to the Sacramento River. This canal contains pockets of willow and emergent marsh vegetation. It provides habitat for the giant garter snake, Swainson's hawk, and Central Valley steelhead. Rodent burrows along the banks of the canal provide suitable habitat for burrowing owls. From MP 1.1 to 3.7, the alignment crosses primarily pasture and isolated seasonal wetlands. At MP 2.4, the ROW crosses a northern claypan vernal pool.

Plants and Wildlife

Vegetation in the area includes non-native grasses. Mammals and birds found in the vicinity of Segment 3 include the California ground squirrel, magpie, and heron. The Natomas East Main Drainage Canal provides habitat for waterfowl, migrating birds, and other wildlife.

Special-Status Wildlife and Plant Species

The Natomas East Main Drainage Canal provides habitat for the Central Valley steelhead, burrowing owl, and Swainson's hawk. The open water canal is sparsely vegetated, providing marginal habitat for the giant garter snake. Wetlands in the ROW provide habitat for dwarf downingia, California linderiella, and vernal pool fairy shrimp.

4.2.2 Environmental Consequences

4.2.2.1 Standards of Significance

A significant effect on biological resources would occur under the following conditions:

- Loss of habitat or individuals resulting in the listing, or jeopardizing the continued existence of any species;
- Loss of habitat or individuals, resulting in the decline of its listing status (*e.g.*, from threatened to endangered); or
- Introduction or spread of noxious weeds.

Short-term impacts are those that last through the construction phase of a project or one or two reproductive cycles, whichever is longer.

Long-term impacts are those that last as long as the life of the transmission line or longer, depending on the organism or habitat involved.

Direct impacts are those that occur as a result of construction and maintenance or operation of the transmission line.

Indirect impacts are those that occur as a result of the transmission line presence. These are usually associated with increased human accessibility to a previously inaccessible area.

4.2.2.2 Environmental Protection Measures

EPMs for biological resources from Table 3-3 include the following:

15. Mitigation measures developed during the consultation period under Section 7 of the ESA would be adhered to, as specified in the subsequent Biological Opinion of USFWS. In addition, applicable mitigation developed in conjunction with state and Tribal authorities would be followed.
16. Before construction and maintenance, all personnel entering the construction area would be trained on the protection of cultural, paleontological, and ecological resources. To assist in this effort, construction and maintenance contracts would address applicable Federal, state, local, and Tribal laws regarding collection and removal of antiquities, fossils, plants, and wildlife. Training would include the importance of these resources and the purpose and necessity of protecting them.
17. Special-status species and their habitats would be protected during post-EIS and EIR phases of the project. This may involve conducting surveys for habitat, plant, and wildlife species of concern. Where special-status species or their habitats are found, appropriate action would be taken to avoid adverse impacts on the species and/or their habitat.
18. A qualified biologist would conduct surveys in sensitive habitats before clearing vegetation. The purpose of this survey would be to identify biologically sensitive issues such as wetlands, vernal pools, or habitat of concern. Western would avoid or use best management practices to lessen disturbance.
19. During construction and maintenance, no equipment refueling or oil changing would be

conducted within 300 feet of any bodies of water or streams.

20. Within riverine habitat, ROW clearing would be done by mechanical and manual methods. Construction and maintenance activities would be avoided within 100 feet of the stream bank.

21. Vegetation would be controlled or removed in accordance with Western's *Integrated Vegetation Management Environmental Guidance Manual* (Western 2007b).

22. To the extent practical, freshwater emergent, lacustrine, and riverine wetlands would be spanned and vehicular traffic would not encroach within 100 feet of the boundary of these wetlands.

23. To the extent practical, when water is present, vernal pools would be driven around, spanned, or otherwise avoided.

24. Replacing insulators on structures containing active raptor nests would be conducted after birds have fledged. Inactive nests would not be removed from structures without a permit, unless they pose a safety or reliability hazard.

25. Western would span the Feather River and Cross Canal riparian corridor and no construction or maintenance equipment would cross these water bodies. Sedimentation control structures would be used to prevent sediment from reaching riverine habitat.

26. Hazardous materials would not be drained onto the ground or into streams or drainage areas. All construction and maintenance waste would be removed daily. This would include trash and litter, garbage, other solid waste, petroleum products, and other regulated materials. The materials would be sent to a disposal facility authorized to accept such materials.

27. At completion of work and at the request of the land owner/manager, all work areas except access roads would be scarified or left in a condition that would facilitate natural vegetation. The site would be recontoured to provide for proper drainage, and prevent erosion.

28. Equipment would be washed prior to entering sensitive areas within the Project area to control noxious weeds. The rinse water would be disposed of through the sanitary sewage system.

29. Vernal pool resources–specific. Biological reconnaissance surveys, preconstruction surveys, and other biological investigations would be conducted to identify on-site vernal pool resources. If it is determined that wetland and/or vernal pool resources occur, Western would consult with USFWS. Western would assume presence of listed species in suitable vernal pools. Section 7 consultation with USFWS would determine appropriate measures to avoid and minimize loss of individuals.

30. Boggs Lake hedge hyssop and legenere-specific. If preconstruction surveys determine the presence of the species, Western would consult with USFWS to determine appropriate measures to avoid and minimize loss of individuals.

31. Riparian habitat–specific. If riparian vegetation requires replacement, it will be replaced at a 3:1 ratio on site or within the watershed, using native riparian trees and/or vegetation.

32. Valley elderberry longhorn beetle–specific. Surveys for beetles and elderberry host plants by a qualified biologist will be conducted prior to construction and maintenance activities. To the maximum extent practicable, the project will avoid stands of elderberry bushes and avoid isolation of elderberry bushes from other nearby plant populations.

33. Valley elderberry longhorn beetle-specific. If elderberry plants cannot be avoided, and if approved by the USFWS through consultation, then transplantation/replacement mitigation measures may be implemented. Preconstruction surveys will assess the appropriate amount of mitigation.

34. Western spadefoot toad–specific. If preconstruction surveys determine the presence of the toad, Western would consult with USFWS to determine appropriate measures to avoid and minimize take of individuals.

35. Giant garter snake–specific. Preconstruction surveys for giant garter snake would be completed by a qualified biologist approved by USFWS. If any snake habitat is found, additional measures would be implemented to minimize disturbance of habitat and harassment of the species.

36. Giant garter snake–specific. Between April 15 and September 30, all irrigation ditches, canals, or other aquatic habitat would be completely

dewatered, with no puddle water remaining, for at least 15 consecutive days prior to the excavation or filling in of the dewatered habitat. Efforts would be made to ensure that dewatered habitat does not continue to support prey. If a site cannot be completely dewatered, netting and salvage of prey items may be necessary.

37. Giant garter snake–specific. For sites containing snake habitat, and no more than 24 hours prior to start of construction activities (site preparation and/or grading), the Project area would be surveyed for the presence of the snake. If construction activities stop on the site for a period of 2 weeks or more, a new snake survey would be completed no more than 24 hours prior to the resumption of construction activities.

38. Giant garter snake–specific. Clearing would be confined to the minimal area necessary to facilitate construction and maintenance activities. Giant garter snake habitat within or adjacent to the Project would be flagged and designated as environmentally sensitive areas. This area would be avoided by all construction personnel.

39. Giant garter snake–specific. If a live giant garter snake is found during construction and maintenance activities, USFWS and the Project's biological monitor will be notified immediately. The biological monitor or his/her assignee shall do the following:

    1. Escape routes for snakes should be determined in advance of construction and maintenance and snakes should always be allowed to leave on their own.
    2. Stop construction and maintenance activities in the vicinity of the snake.
    3. Monitor the snake and allow it to leave on its own. The monitor shall remain in the area for the remainder of the workday to make sure that the snake is not harmed, or if it leaves the site, that it does not return. If a giant garter snake does not leave on its own within 1 working day, further consultation with USFWS would be required.

40. Giant garter snake–specific. If any temporary fill and/or construction debris situated near undisturbed giant garter snake habitat is to be removed between October 1 and April 30, it would be inspected by a qualified biologist to ensure the snakes are not using it as an overwintering site.

41. Giant garter snake–specific. No plastic, monofilament, jute, or similar erosion control matting that could entangle snakes would be placed on a Project site when working within 200 feet of snake habitat. Possible substitutions include coconut coir matting, tactified hydroseeding compounds, or other material approved by USFWS.

42. Northwestern pond turtle–specific. Take of the turtle as a result of habitat destruction during construction and maintenance activities, including maintenance and removal of irrigation ditches and drains, would be minimized by the dewatering requirements described for the giant garter snake.

43. Chinook salmon or steelhead–specific. The site would be monitored to ensure that no listed fish are present and/or harmed if working in a water channel. If listed fish are present, NMFS and CDFG, if appropriate, would be consulted.

44. Western yellow-billed cuckoo–specific. If preconstruction surveys or other sources determine the presence of nesting birds, construction avoidance areas would be enforced for a distance of 300 feet from the nest site, until young birds have fledged and left the nesting site.

45. Bank swallow–specific. Disturbances to nesting colonies would be avoided during the nesting season of May 1 through August 31, or until a qualified biologist, with concurrence of USFWS and CDFG, if appropriate, has determined that the young have fledged or the nests are no longer occupied.

46. Bank swallow–specific. If preconstruction surveys identify an active nesting colony, brightly colored construction fencing would be installed 250-feet from the active nesting colony. No construction would occur within the 250-foot fenced area during the nesting season. In addition, disturbances within 0.5 mile upstream or downstream of a colony located on a natural waterway would be avoided.

47. Tricolored blackbird–specific. If preconstruction surveys determine the presence of breeding and nesting birds, disturbances to nesting colonies would be avoided. A boundary shall be marked by brightly colored construction fencing

establishing a 500-foot buffer from the active nest site. No disturbances would occur within the 500-foot area during the nesting season, February 1 to August 1 or while birds are present. Before the site can be disturbed, a qualified biologist, with concurrence by USFWS, would determine if the young have fledged and nest sites are no longer active.

48. Burrowing owl–specific. Preconstruction surveys would be conducted prior to earth-disturbing activities to determine the presence of foraging or nesting owls. The surveys would be conducted by a qualified biologist. Results of the preconstruction surveys would be submitted to the land use agency with jurisdiction over the site prior to commencement of construction activities and a mitigation program would be developed and agreed to by the land use agency and Western prior to initiation of any physical disturbance on site.

49. Burrowing owl–specific. Occupied burrows shall not be disturbed during nesting season (February 1 through August 31). No disturbance should occur within 50 meters of occupied burrows during the non-breeding season (September 1 to January 31) or within 75 meters during the breeding season (February 1 to August 31). A minimum of 6.5 acres of foraging habitat, contiguous with occupied burrow sites, would be permanently preserved for each pair of breeding burrowing owls or single unpaired resident bird.

50. Burrowing owl–specific. If nests are found, USFWS and CDFG, if appropriate, would be contacted regarding suitable mitigation measures. These may include a 300-foot buffer around the nest site during the breeding season, relocation efforts for owls that have not begun egg-laying and incubation, or relocation of juveniles capable of independent survival. If on-site avoidance is required, the boundaries of the buffer zone would be determined by a qualified biologist and marked with yellow caution tape, stakes, or temporary fencing. The buffer zone would be maintained throughout the construction period. If relocation is approved by USFWS, a qualified biologist will prepare a plan for relocating the owls to a suitable site.

51. Swainson's hawk–specific. A preconstruction survey would be completed to determine if active Swainson's hawk nest sites occur on or within 0.5 mile or if any Swainson's hawk nest trees would be removed on the Project site. Surveys would be conducted by experienced Swainson's hawk surveyors using Swainson's hawk Technical Advisory Committee's methods (May 31, 2000 or newer), as approved by USFWS.

52. Swainson's hawk–specific. If breeding hawks are identified, no disturbances would occur within 0.5 mile of an active nest between March 15 and September 15, or until a qualified biologist, with discussion with CDFG, if appropriate, has determined that the young have fledged or the nest is no longer occupied. If an active nest site is located within 0.25 mile of existing urban development, a no-disturbance zone of 0.25 mile would be set.

53. Swainson's hawk–specific. Where disturbance of a hawk nest cannot be avoided, construction would be deferred until after the nesting season. Then, if necessary, the nest tree may be removed after discussion with CDFG, if appropriate, and it has been determined that the young are no longer dependent upon the nest tree.

54. Swainson's hawk–specific. If construction activities would cause nest abandonment or force out fledglings within a 0.25-mile buffer zone of the Project area, an on-site qualified raptor biologist would be assigned to the project.

55. Swainson's hawk-specific. Valley oaks, tree groves, riparian habitat, and other large trees used by Swainson's hawk and other animals will be preserved wherever possible. If Swainson's hawk nest trees are lost, Western would implement mitigation planting.

56. Upon locating dead, injured or sick threatened or endangered species, the USFWS Division of Law Enforcement (2800 Cottage Way, Sacramento, CA 95825) or the Sacramento Fish and Wildlife Ecological Services Office (2800 Cottage Way, Room W-2605, Sacramento, CA 95825, telephone 916-414-6000) must be notified within 1 working day. Written notification to both offices must be made within 3 calendar days and must include the date, time, and location of the discovery and any other pertinent information.

4.2.2.3 Impacts from Alternatives

Project construction and maintenance activities, including access roads, pulling sites, vegetation removal in the new ROW, and structure assembly and erection, may result in adverse impacts to biological resources. The following section discusses how these construction activities may impact critical habitat, special-status species, and sensitive habitat types as they pertain to the standards of significance. Assumptions used to calculate disturbance area are in Appendix B.

Sutter County does not have an adopted Habitat Conservation Plan (HCP), but is in the process of completing a scientific review of the Sutter County Natural Community Conservation Plan/HCP. The Conservation Element of the Sacramento County General Plan outlines policies for resource mitigation and habitat restoration.

Portions of each alternative are located within the Natomas Basin Habitat Conservation Plan (NBHCP) (2003). Additionally, portions of Alternatives B and C are located within the proposed Placer County Conservation Plan (PCCP) (2005). NBHCP and PCCP conservation strategies rely on minimizing, avoiding, and mitigating impacts for species and habitats covered under the plans. Species covered in the NBHCP and PCCP that occur within the Project area include Swainson's hawk, giant garter snake, burrowing owl, northwestern pond turtle, Aleutian Canada goose, valley elderberry longhorn beetle, and bank swallow. Western would consult with the appropriate landowners to comply with existing or planned HCP.

Designated Critical Habitat

Within the study area, NMFS designated the Sutter Bypass, Feather River, and Nelson Slough critical habitat for spring-run chinook salmon and the Central Valley steelhead. In addition to these hydrologic units, Cross Canal, Coon Creek, and Natomas East Main Drainage Canal are designated as critical habitat for the Central Valley steelhead (70 FR 52590 and 52604-52605). Measures described in the EPMs above would be taken to avoid impacts to the Central Valley spring-run chinook salmon and Central Valley steelhead in the locations where the transmission line crosses designated critical habitat.

Alternatives C and B may have one and two structures, respectively, sited in the freshwater marsh associated with Cross Canal. Impacts may include:

- Disturbance to fish during migration;
- Disruption of natural channel processes, including migration and breeding;
- Loss of riparian vegetation; and
- Increased turbidity and sedimentation.

Construction or maintenance would occur in the summer, when water is not present within the freshwater marsh area, to avoid direct impacts to the fish. Western would span designated critical habitat whenever possible.

Essential Fish Habitat

The activities associated with this project that may adversely affect in-stream habitat are the erection of structures within the highwater mark or removal of riparian vegetation along a designated EFH waterbody. Western would avoid construction in waterbodies; however, it may be necessary to clear some vegetation in a riparian zone for worker safety and line reliability. If clearing cannot be avoided in the riparian zone of a designated EFH, Western would consult with USFWS, NMFS, and CDFG, if appropriate. These areas of concern are spread throughout the Project Area; therefore any alternative may be affected by construction within a designated EFH.

Special-Status Wildlife and Plant Species

To avoid or minimize impacts to special-status species and minimize alteration of habitat resulting in the listing of a species, all construction personnel would be instructed prior to construction on Federal, state, and Tribal laws regarding plants and wildlife, including collection and removal, and the importance of these resources and the purpose and necessity of protecting them.

Construction sites located in sensitive habitats would require a qualified biologist to survey and identify biologically sensitive issues before clearing vegetation. This would minimize the unnecessary loss of vegetation.

Endangered or threatened wildlife and plant species associated with sensitive habitat may be adversely impacted by the movement of vehicles through sensitive habitats or construction within these areas. Where necessary, construction vehicles would drive around sensitive habitat and work from the other side. Table 4.2-1 presents the acres of disturbance in sensitive areas. Special-status

Table 4.2-1 Acres of Sensitive Habitat and Area of Disturbances Associated with Project Routes

Habitat Type	Alternative							
	A1	A2	A3	A4	A5	B	C	No Action
Rice Fields (Total Acres)	270.3	260.6	281.1	272.3	279.8	162.7	236.0	0.0
Riverine/Riparian (Total Acres)	10.9	10.9	9.9	9.9	9.9	10.8	9.6	0.0
Vernal Pools, Seasonal Wetlands, and Wetland Swales (Total Acres)	4.0	4.0	9.2	3.4	3.7	11.1	11.8	0.0
Freshwater Emergent Wetlands (Total Acres)	8.1	8.1	8.1	8.1	8.1	19.5	10.8	0.0
Rice Fields Short-term/Long-term Acres of Disturbance	57.2/ 34.9	55.6/ 33.9	59.0/ 36.0	56.1/ 34.1	60.0/ 36.6	32.9/ 20.0	41.1/ 22.5	0/0
Riverine/Riparian Short term/Long-term Acres of Disturbance	2.1/ 1.3	2.1/ 1.3	1.9/ 1.2	1.9/ 1.2	1.9/ 1.2	2.1/ 1.3	1.8/ 1.1	0/0
Vernal pools, Seasonal Wetlands, and Wetland Swales Short-term/Long-term Acres of Disturbance	0.4/ 0.1	0.4/ 0.1	1.4/ 0.8	0.3/ 0.0	0.3/ 0.1	1.8/ 1.0	1.3/ 0.5	0/0
Freshwater Emergent Wetlands Short term/Long-term Acres of Disturbance	1.6/ 1.0	1.6/ 1.0	1.6/ 1.0	1.6/ 1.0	1.6/ 1.0	3.7/ 2.4	1.9/ 1.1	0/0
Number of Structures in Sensitive Habitats/Acres of Long-term Disturbance	5/ 0.05	5/ 0.05	7/ 0.07	5/ 0.05	5/ 0.05	11/ 0.11	8/ 0.08	0/0

Source: Western GIS 2007

Assumptions used to make calculations:

A new structure every 1,100 feet;

0.23 short-term acre for each structure; and

0.01 long-term acre for each structure.

Access Road Assumptions:

Assume 0 acres for Segment 1 access road because it's in existing ROW;

Assume access roads parallel to transmission lines for Segments 1, 2A1, 2A2, 2A3, 2A4, 2A5, and 2B;

Assume 6.3 miles of new access road for 2C portion (9.4 miles is along existing ROW);

Assume 15 foot width for access roads; and

Assume road disturbance acres for long- and short-term = miles*5280*15'width\43560.

Assume a pulling site every three miles and 0.4 acre short-term disturbance per site.

Assume Materials Storage Yard every 15 miles and short-term disturbance of 5 acres per site.

Rice Fields - Short-term disturbance does not include material storage yards, straight ratio of long-term disturbance to transmission line length.

Riparian short-term does not include material storage yards and pulling sites.

Emergent wetlands short-term does not include material storage yards and pulling sites.

Vernal pool short-term does not include material storage yards and pulling sites.

Structures in sensitive habitat assumes 0.01 acre of long-term disturbance per structure, and does not include access roads.

species supported by each of the sensitive habitats are presented in Table 4.2-2.

Impacts to wetlands associated with Feather River, Gilsizer Slough, Cross Canal, Natomas East Main Drainage Canal, and rice fields would be a primary concern for each alternative. Long term disturbance to 0.02 acre within a vernal pool complex may result from two structures in Segment 3. Temporary disturbance of vernal pools and swales may result in

Table 4.2-2 Sensitive Habitats and Supported Special-Status Species

Agriculture Lands, Rice Fields, and Canals	Riverine and Riparian	Vernal Pools and Swales	Freshwater Emergent Wetlands and Seasonal Wetlands
western burrowing owl	Cooper's hawk	slender Orcutt grass	Cooper's hawk
Swainson's hawk	Swainson's hawk	Sacramento Orcutt grass	Swainson's hawk
Aleutian Canada goose	loggerhead shrike	Solano grass	American peregrine falcon
tricolored blackbird	Aleutian Canada goose	legenere	bald eagle
giant garter snake	western yellow-billed cuckoo	dwarf downingia	Aleutian Canada goose
	greater sandhill crane	California linderiella	tricolored blackbird
	bald eagle	vernal pool fairy shrimp	western yellow-billed cuckoo
	purple martin	vernal pool tadpole shrimp	White-faced ibis
	bank swallow	California linderiella	greater sandhill crane
	northwestern pond turtle		giant garter snake
	Central Valley steelhead		northwestern pond turtle
	Central Valley winter-run chinook salmon		Conservancy fairy shrimp
	Central Valley spring-run chinook salmon		California linderiella
	Central Valley fall-run chinook salmon		vernal pool fairy shrimp
	Sacramento splittail		vernal pool tadpole shrimp
	valley elderberry longhorn beetle		longhorn fairy shrimp
			midvalley fairy shrimp
			slender Orcutt grass
			Sacramento Orcutt grass
			Solano grass
			legenere
			dwarf downingia

Source: Burleson 2007

the loss of individual special-status species. Vernal pools have been known to recover within one to four seasons following disturbance, as long as the hardpan in the soil is not penetrated. Soil disturbance from temporary roads and pulling sites would not be deep enough to damage the impermeable soil layer. Consultation with USFWS would determine what mitigation may be required for temporary impacts to threatened or endangered species habitat.

Alternatives B and C may impact wetlands associated with Curry and Pleasant Grove creeks. The impacts to wetlands from each alternative are presented in

Table 4.2-1. The species that may be impacted by wetland disturbance are listed in Table 4.2-2.

Construction and maintenance in and around agricultural lands, rice fields, and canals could result in the loss of individual western burrowing owls or giant garter snakes. Compliance with EPMs during construction and maintenance of the transmission line for each segment would allow Western and its contractors to avoid or reduce impacts. Most bird species are sufficiently mobile to avoid construction and maintenance activities. Measures would be taken during construction to avoid active nests. New transmission lines would be constructed adjacent to rice fields, marshes, Great Valley Riparian Forest, and waterways that attract Swainson's hawk, bank swallow, and migrating birds. Bird collisions may occur when birds are unable to see the lines, especially during fog and rain. If collisions occur, Western would provide marking devices to reduce them. These devices would use the best technology currently available to alert birds to an obstacle in the air. The need to comply with the National Electric Safety Code for design of lines above 69 kV would minimize the risk of larger bird electrocutions.

Sensitive Habitat Types

Each alternative may result in the alteration or temporary disturbance of riverine and riparian habitat (see Table 4.2-1) and may impact one or more of the sensitive communities. Each alternative may have two structures sited within Gilsizer Slough and one within riparian habitat between Nelson Slough and the Feather River. No construction and maintenance equipment would cross the water bodies. Sedimentation control measures would be used to prevent sediment from reaching riverine habitat.

Impacts to Great Valley Riparian Forest and Scrub habitats and freshwater emergent wetlands would occur if large woody vegetation was removed from the water's edge in riparian habitats. This could result in additional solar heating of the water. The Sacramento County General Plan calls for no net loss of riparian habitat. Western would consult with the appropriate agencies to minimize temporary and/or permanent loss of habitat or individuals that may jeopardize the continued existence of a species or allow its listing status to decline. Removing vegetation in riparian zones could also result in erosion with the subsequent increase in sedimentation of the watercourse. This would reduce the value of the habitat to aquatic and semi-aquatic wildlife.

Where previously cleared areas are not available, it may be necessary to clear vegetation for pulling sites and staging areas. These areas may include locations where pulling sites occur at turning structures. Because the conductors and overhead ground wires are pulled in a straight line, when the transmission line turns a corner, pulling sites would occur outside of the ROW. Removing vegetation in these areas would be a short-term impact because vegetation would grow back. However, this may contribute to the introduction or spread of noxious weeds. To control the spread of noxious weeds, equipment would be washed prior to entering the Project area. The water would be disposed of through the sanitary sewer system.

4.2.2.4 Impacts from the No Action Alternative

If the facilities were not developed, routine and emergency maintenance would increase due to the advancing age of the equipment. The need for increased maintenance results in more emergency maintenance, which may threaten worker and public safety and the reliable delivery of electricity.

Under the No Action Alternative, additional indirect impacts to biological resources would not occur. However, direct impacts associated with increase in routine and emergency maintenance would occur. Activities in the ROW, including the methods used for access and maintenance, would remain the same or increase.

No additional impacts to special-status species would occur beyond those described in the Programmatic Biological Opinion issued for Western's routine maintenance activities by USFWS on March 30, 2005.

4.2.2.5 Cumulative Impacts

The Sacramento Valley provides habitat essential for some threatened and endangered species. Currently, the irrigated rice fields, riverine and riparian habitat, wetlands, and seasonal wetlands provide habitat for giant garter snake, Central Valley chinook salmon and steelhead, migrating birds, vernal pool shrimp, valley elderberry longhorn beetle, and special-status plant species.

Past and present land uses in the Project area were primarily agricultural with encroaching residential development. Project construction and maintenance

could permanently disturb up to 36.6 acres of irrigated rice fields, 1.3 acres of riparian habitat, 0.8 acre of seasonal wetlands and vernal pools, and 2.4 acres of freshwater marsh. Species that utilize these habitats are listed in Table 4.2-2. Fragmentation and loss of habitat have contributed to declines in these species populations, principally as a result of urban development and conversion of native habitat to agriculture (Ehrlich 1998; Klute et al. 2003; USFWS 1999; Wilcox and Murphey 1985; Woodbridge 1998). Consultation with the appropriate agencies would determine what mitigation may be required to offset impacts to threatened or endangered species habitat; therefore, this project would not contribute to a loss of habitat.

Foreseeable future projects in the study area include continued commercial and residential developments that could result in a conversion of sensitive habitats to urban uses unable to support special-status species (SACOG 2005a). This urban development would further fragment and reduce available habitat. Figure 4.9-3 shows planned development and potential projects that would convert agriculture land to urban use in Sacramento, Sutter, and Placer counties.

Within the study area, the USFWS provides a mechanism for protecting special-status species and habitats through the development of HCPs. Part of the Project area lies within the boundaries of the NBHCP as well as other HCP that have yet to be finalized, but are imminent. These plans provide for limited authorized development for Land Use Agency permittees. The NBHCP was established to promote biological conservation, along with agricultural and economic development, and is designed primarily to protect Swainson's hawk and the giant garter snake; and secondarily, a variety of wetland, upland, and vernal pool special-status species. The expected planned growth within the Sacramento area would result in loss of habitat for special-status species. By participating with consulting agencies, HCP, and other conservation and mitigation efforts, these losses would be reduced to less than significant.

4.2.2.6 Summary of Impacts

Table 4.2-1 presents impacts from each alternative. Western would consult with the appropriate agencies to compensate for any loss of riverine and riparian habitat, agricultural lands, and a variety of wetland habitats prior to beginning construction activities. Complying with EPMs and incorporating measures identified through agency consultations would prevent the alternatives from causing a significant direct, indirect, or cumulative impact.

4.3 CULTURAL RESOURCES

4.3.1 Affected Environment

This section describes cultural resources located within the proposed Project area and the impacts the proposed Project may have on these resources. Cultural resources are sites, structures, landscapes, and objects of importance to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources also include traditional lifeways and practices, community values, and institutions. Cultural resources have an important role in connecting contemporary societies to their heritage and traditions. These resources are non-renewable. Once damaged or destroyed, they cannot usually be restored or reconstructed to a degree matching their original integrity or value.

4.3.1.1 Resource Study Area

The study area for cultural resources includes the "area of potential effects," as defined by 36 CFR Part 800.16[d]. The area of potential effects (APE) is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties." The APE for visual effects, as determined in consultation with the California State Historic Preservation Officer (SHPO) includes an area of at least 1 mile from any project component. The APE also includes a width of 200 feet (100 feet each side of the centerline) of each segment, where ground-disturbing activities could occur.

4.3.1.2 Issues of Environmental Concern

The following laws, regulations, and Executive Orders (EO) contain specific cultural resource requirements or restraints that could affect the alternatives:

- National Historical Preservation Act (NHPA) of 1966, as amended (16 U.S.C. §§ 470, *et seq*.) and implementing regulations (36 CFR Part 800)
- California Public Resources Code (PRC) Section 5000.1, which establishes the *California Register of Historical Resources* and criteria for eligibility. It prohibits obtaining or possessing Native American artifacts or human remains. This section sets procedures for notification if

Native American artifacts or remains are discovered.

- American Indian Religious Freedom Act (AIRFA) of 1978 (42 U.S.C. § 1996)
- Archaeological Resources Protection Act (ARPA) of 1979 (16 U.S.C. §§ 470aa, as amended, and implementing regulations at 43 CFR Part 7)
- EO 13007, Indian Sacred Sites, May 24, 1996
- Scoping comments: The United Auburn Indian Community, composed of Miwok and Maidu Indians, expressed interest during the SEIS and EIR scoping phase. They requested that a qualified archaeologist conduct a field survey of the proposed Project site and complete a literature search at the appropriate Information Center associated with the California Historical Resources Information System. They also requested to receive notification and a copy of the cultural resources report.

This Draft SEIS and EIR organizes cultural resource information into the categories of prehistoric cultural resources, historic cultural resources, and traditional cultural properties (TCP). A cultural resource can fall into more than one category from a long period of use or for multiple functions.

Prehistoric Cultural Resources

Prehistoric resources refer to any material remains, structures, and items used or modified by people before the establishment of a European presence in the Sacramento Valley in the early 19th century. Examples of prehistoric resources in the study area include village sites, rock shelters, rock art, water-control features, game drives or traps, aboriginal trails, campsites, and scatters of prehistoric artifacts.

Historic Cultural Resources

Historic resources include material remains and landscape alterations since the arrival of Europeans in the area. Examples in the study area include homestead, ranching, and agricultural features; water control features; mining features; historic trails, roads, and railroad features; buildings and structures in cities; Native American resources; and scatters of historic artifacts.

Traditional Cultural Properties

TCPs are places associated with the cultural practices or beliefs of a living community. These sites are rooted in the community's history or are important in maintaining cultural identity. The relationships between these cultures and their surroundings are as varied as the cultures themselves. These relationships may have resulted in the attachment of traditional, spiritual, or religious aspects to various natural and cultural features. Religious resources, such as sacred areas or places, are needed for the practice of a religion. These resources have attained a position in the religious or spiritual history and activities of the community and are a part of that particular culture's spiritual survival. Very often religious resources also are considered to be TCPs.

4.3.1.3 Characterization

Native American Consultation

Western contacted the California Native American Heritage Commission (NAHC) to identify appropriate Native American contacts for the study area. In a letter dated March 23, 2007, the NAHC identified several Tribes likely to have an interest in the proposed Project. Western will continue to consult with all interested Tribes throughout the process.

Literature Search

Western completed archival research to determine if any historic or archaeological sites have been identified within the ROWs or within 1 mile of the ROW of any of the alternatives. Western conducted research at the California Historical Resources Information System North Central Information Center at California State University in Sacramento and Northeast Information Center at California State University in Chico. In addition, historic records and maps of the General Land Office were reviewed to identify locations of early historic roads, railroads, residential buildings, and other potentially historic features within or near the ROW. USGS maps dating from the early 1950s also were examined to determine the locations of buildings and structures that could be older than 50 years within a mile of the ROW.

Field Survey Methodology

Western evaluated previous pedestrian surveys of portions of the proposed Project area for adequacy. All previous surveys were either more than 10 years old or were not surveyed at the same level of intensity required for the SVS Draft SEIS and EIR survey (15-meter-wide transects). A cultural

resources pedestrian survey was conducted in August 2006 to characterize the accessible portions of the study area for the SVS Draft SEIS and EIR analysis (CH2M Hill 2007). The survey covered proposed route segments within a 200-foot-wide corridor and within a 300-foot radius surrounding all turning structures to accommodate pulling and tensioning equipment. Under consultation with the SHPO, this survey area will be extended to 700 feet and additional survey conducted for the Preferred Alternative. Surveyors walked the survey areas in systematic linear transects, spaced 15 meters apart, to locate all cultural resources. When sites were located, the members of the survey crew examined the areas near the original find closely in all directions to define the contents of the site and its boundaries.

The pedestrian inventory does not reflect a 100-percent survey of the APE. Western and the SHPO agreed that portions of the study area could not be surveyed because of the presence of rice fields. In other cases, landowner did not grant permission to access some areas. The west side of SR 99 was also not included in the pedestrian surveys because it was only recently identified as an alternative route; most landowners associated with the alignment west of SR 99 denied right of entry for surveys. Overall, it was possible to survey only about 44 percent of the study area. Survey coverage ranged from 43.1 to 61.1 percent for each alternative (see Table 4.3-1). A complete survey of any remaining portions of the final alignment and access roads will take place after the Preferred Alternative is chosen. Western will consult with the SHPO at that time under Section 106 of the NHPA regarding the identification and evaluation of historic properties and the assessment of effects on significant properties.

Western also conducted a reconnaissance of historic buildings and structures. The reconnaissance team checked maps to determine which buildings and structures were present 50 years ago. They then examined these locations in the field to determine which of the buildings and structures are still present. In addition, Western examined the remaining buildings and structures that are older than 50 years to determine whether these buildings retain structural and design integrity and could be significant historic structures.

Cultural Resources Identified

The letter from the NAHC stated there are no known TCPs or sacred sites located in the study area.

Field surveys identified no prehistoric cultural resources located within the survey area. The area outside of the Project ROW but within one mile of it contains a prehistoric archaeological site, several historic-era refuse deposits associated with farming or farmsteads, and a World War I era feed mill.

Segment 3 would rebuild about 4.8 miles of the 115-kV Elverta-North City transmission line between the Elverta and Natomas substations. Segment 2C would abandon about 8.7 miles of the Cottonwood-Roseville transmission line. The Cottonwood-Roseville and Elverta-North City transmission lines were constructed in 1947 and 1955, respectively. These transmission lines may be

Table 4.3-1. Pedestrian Archaeological Survey Coverage

Alternative	Total Acres	Acres Surveyed	Acres not Surveyed				Percent Surveyed
			Due to Agriculture	Due to Landowner	Due to Dense Vegetation/ Waters	Due to Development/ Industry	
A1-East	813.1	368.4	104.2	286.9	35.1	18.5	45.3%
A2-East	810.7	373.3	104.2	279.6	35.1	18.5	46.0%
A3-East	817.4	362.0	104.2	297.6	35.1	18.5	44.3%
A4-East	852.2	360.5	104.2	333.9	35.1	18.5	42.3%
A5-East	816.5	354.1	104.2	304.6	35.1	18.5	43.4%
B	756.4	454.9	100.3	150.2	32.5	18.5	60.1%
C	920.2	546.1	157.9	164.8	32.9	18.5	59.3%

eligible as historic properties because they are more than 50 years old.

The Reclamation District 1000 Rural Historic Landscape District is a historic property that covers a significant portion of the southwest study area. Several segments encounter or cross portions of this 90-square mile district. Reclamation District 1000 is a cultural landscape with a period of significance from 1911 to 1939. It consists of the Sacramento River levee; several large drainage and irrigation canals and their levees; smaller drainage and irrigation ditches; a roadway network; eight pumping plants; and associated landscape of large agricultural fields bounded by roadways and water management features. Reclamation District 1000 includes 30 linear miles of major canals and more than 150 linear miles of irrigation and drainage ditches. This property was found eligible for listing in the National Register of Historic Places. Reclamation District 1000 was documented with archival-quality photographs, which were placed in the Historic American Engineering Record as mitigation for a flood control project that involved improvements to the levee, drainage, and roadway systems. Each segment in the study area spans at least one contributing element of this property, including the Cross Canal and Levee. Segments also may span contributing elements of this district, including the Natomas East Main Drainage Canal and East Levee; the East Drainage Canal; Sankey, Riego, and West Elverta roads; and the Pleasant Grove Creek Canal and levee. Segments 2A1, 2A2, 2A3, 2A4, and 2A5 also cross numerous small drainage and irrigation canals that are not individually named but are part of this historic landscape district. Segments 2B and 2C encounter contributing elements to the Reclamation District 1000 Rural Historic Landscape District. Segment 2B spans the Cross Canal and Levee, then runs parallel with the northeast boundary of the district along the Pleasant Grove Creek Canal between Howsley and Sankey roads, but outside of the district boundary. Segment 2C spans the Cross Canal and Levee but does not otherwise enter the district. Segment 3 also traverses a portion of Reclamation District 1000, along its southeastern edge, and crosses the East Levee and Natomas East Main Drainage Canal.

The Feather River Bypass Levee and Levee are also potentially eligible historic properties in the Study Area. Segment 1 would cross these properties. Sites recorded or re-recorded during the pedestrian archaeological survey included the former Western Pacific Railroad ROW (still in use by the Union Pacific Railway) (Segments 2B, 2C, and 3); the abandoned right-of-way of the Sacramento Northern railroad and row of abandoned telephone poles located along this ROW (Segment 2B); a historic-era refuse scatter in an agricultural field (Segment 1); a large refuse pile and a concrete foundation (Segment 2B); a former farmstead site with barn and partly collapsed shed buildings (Segment 2B); a corral and loading chute (Segment 2C); and a pedestrian or horse underpass through a large earthen berm with two hitching posts (Segment 3).

Although it is not known what additional sites occur within the portions of segments that were not surveyed, farming-related sites of the historic era are most likely. Prehistoric sites are also somewhat likely near the major waterways and on the edge of the upland terrace adjacent to the Natomas Basin.

During the buildings and structures reconnaissance survey, Western identified 78 farmsteads or buildings more than 50 years old within a mile of one or more of the alternative routes. Western will conduct additional reconnaissance for the Preferred Alternative to examine whether these properties are architecturally or historically significant and retain integrity. If so, Western will determine whether the transmission line could have an adverse effect on their integrity of setting. This study will be conducted in consultation with the SHPO in compliance with Section 106 of the NHPA.

4.3.2 Environmental Consequences

Potential impacts from constructing and operating the proposed Project could include disturbance or destruction of archaeological deposits. Impacts also could result from the visual effects of introducing new structural elements, affecting the integrity of a historic building, structure, landscape, or TCP. Potential impacts of ROW maintenance also might involve ground disturbance for access road clearance or vegetation management. Alternatives requiring construction of new access roads would have the highest potential for impacts to archaeological resources. Augering new holes for transmission line structure foundations would have the next largest impact. Removing an existing transmission line could impact archaeological resources from pulling or digging out transmission line structures. Construction noise could be considered a temporary impact to the setting of a historic property.

4.3.2.1 Standards of Significance

A significant effect on cultural resources would occur under the following conditions:

- Unmitigated adverse effect to an NRHP-eligible cultural resource or TCP; or
- Disturbance of any human remains, including those interred outside of formal cemeteries.

4.3.2.2 Environmental Protection Measures

EPMs for cultural resources from Table 3-3 include the following:

57. Before construction, all supervisory construction personnel would be instructed by Western on the protection of cultural, paleontological, and ecological resources and that cultural resources might be presented in the study area. To assist in this effort, the construction contract would address applicable Federal and state laws regarding antiquities, fossils, plants, and wildlife, including collection and removal, and the importance of these resources and the purpose and necessity of protecting them. Contractors would be trained to stop work near any discovery and notify Western's regional environmental manager, who would ensure that the resource is evaluated and avoided. Known cultural resources would be fenced and a minimum distance maintained for work disturbances.
58. Where ground-disturbing activities are identified, cultural resource evaluations would be done to determine the need for field inventory. Construction activities would avoid all historic properties or a special use permit or Memorandum of Agreement would be developed in consultation with the SHPO. Avoidance would include the use of temporary construction fencing where activities are planned to take place near cultural resources sites boundaries.
59. Direct impacts to irrigation system and drainage canal features that are eligible for the NRHP would be avoided during the siting of new transmission line structures and access roads and most other irrigation system features would be avoided to the extent practicable in siting new structures and access roads.
60. Cultural resources would be considered during post-EIS phases of Project implementation. Surveys would be completed to inventory and evaluate cultural resources of the Preferred Alternative, or of any components that might be added to the project, or any existing components that would be modified. These surveys and any resulting property evaluation and analysis of effects would be conducted in accordance with Section 106 of the NHPA and in consultation with the SHPO.

4.3.2.3 Impacts From Alternatives

Each alternative would rebuild about 4.8 miles of the Elverta-North City and Elverta-Natomas transmission line that is more than 50 years old and a potential historic resource. Alternative C would abandon an additional 8.7 miles of Cottonwood-Roseville transmission line that is more than 50 years old and a potential historic resource. Western would record and evaluate these transmission lines to determine eligibility as part of SHPO consultation.

Each alternative would cross or parallel potentially historic resources, including the Feather River Bypass Levee, the Feather River Levee, and a historic-era refuse scatter along Segment 1. The proposed Project would span the Feather River Bypass Levee and any potential effects would likely be indirect. The proposed Project would likely avoid the historic-era refuse scatter, but it is possible that construction of access roads or structures could affect this site.

Each alternative would span elements of Reclamation District 1000, a well-preserved ordered grid of canals, ditches, levees, roads, and large irrigated field blocks that form an integrated rural landscape. Alternatives A1 to A5 would span Cross Canal, then span or parallel Sankey, Riego, and Elverta roads; the East Drainage Canal; Natomas East Main Drainage Canal; East Levee; and a large network of smaller irrigation and drainage ditches that help to define the cultural landscape. Alternative B would span the Cross Canal, then parallel the Pleasant Grove Creek Canal, but remain outside of the district's boundary. Cross Canal would be the only element of Reclamation District 1000 crossed by Alternative C.

Alternative B would run within the abandoned Sacramento North Railroad ROW. There would be a direct effect on this property, as the transmission structures would be placed on the former railroad grade. If the railroad is determined eligible, the

proposed Project could be considered an adverse effect.

Other potentially historic properties that may be directly affected include the Western Pacific Railroad (active as Union Pacific) (all alternatives); a tunnel and hitching post feature (all alternatives); a barn and collapsed shed and a large refuse scatter (Alternative B); and Sorento Road (all alternatives); and a corral and loading chute (Alternative C).

The proposed Project would introduce new visual elements and temporary construction noise that could potentially affect the setting of significant historic properties for all alternatives.

Western would enter consultation with the SHPO to identify and evaluate historic properties, including Cottonwood-Roseville and Elverta-North City transmission lines, Reclamation District 1000, and determine eligibility and effect of the Preferred Alternative. Western's standard practice is to avoid cultural and historic properties and TCPs. If the potential for adverse impacts is determined, a Memorandum of Agreement would be developed between Western and SHPO that would stipulate appropriate mitigation measures.

EPMs summarized in Section 4.3.2.2 are expected to avoid or minimize the magnitude of any cultural resource impacts. Therefore, significant impacts would not be expected for any alternative. Complete inventories and eligibility and effect determinations will be made in consultation with SHPO and other interested agencies for the Preferred Alternative and any potential effects on historic properties would be resolved through that process.

4.3.2.4 Impacts from the No Action Alternative

There would be no new impacts under this alternative. Impacts would be restricted to existing transmission line and access road maintenance. This includes periodic air and ground patrols. Repair to the transmission lines or structures could involve localized ground disturbance from heavy equipment. Vegetation removal by hand or mechanical equipment may be necessary to improve access roads or access to individual transmission line structures. The EPMs summarized in Section 4.3.2.2 are expected to avoid or minimize the magnitude of cultural resource impacts; therefore, significant impacts are not expected.

4.3.2.5 Cumulative Impacts

It is possible that past, present, and reasonably foreseeable future projects could result in the unmitigated loss of cultural resources or incremental unmitigated damage to them. For example, any intensive development in the Natomas Basin would tend to incrementally reduce the historical integrity of Reclamation District 1000 as a rural historic landscape in ways that may or may not be fully taken into account by mitigation measures. Some impacts to cultural resources would be evaluated and resolved as individual projects are permitted and constructed. The effects of development over a large area can result in the loss of information that would be otherwise available from archaeological deposits that this development removes or damages.

4.3.2.6 Summary of Impacts

Results from the cultural resources analysis indicate that the proposed Project would not have any direct, indirect, or cumulatively significant, unmitigated or residual effects on archaeological or other cultural resources.

4.4 ELECTRIC AND MAGNETIC FIELDS

4.4.1 Affected Environment

Both voltage and current are required to transmit electrical energy over a transmission line. Current, a flow of electrical charge measured in amperes, is the source of a magnetic field. Voltage represents the potential for an electrical charge to do work and is measured in volts (V) or kV. Voltage is the source of an electrical field.

The possibility of adverse health effects from electric and magnetic fields (EMF) exposure has increased public concern in recent years about living near high-voltage transmission lines. The available evidence has not established that such fields pose a significant health hazard to exposed humans. However, the same evidence does not prove that there is no hazard. Therefore, in light of present uncertainty, this section discusses issues, as well as Western's policy to reduce such fields where feasible, until the issue is better understood.

4.4.1.1 Resource Study Area

The study area is the transmission line ROW and any structures (buildings, other transmission lines, etc.) within 200 feet of this ROW. All transmission

lines for the proposed Project would be operated at 230 kV.

4.4.1.2 Issues of Environmental Concern

All transmission lines generate EMF. The existing and new transmission lines would generate similar EMF. The electrical effects of a transmission line can be characterized as "corona effects" and "field effects." Corona is the electrical breakdown of air into charged particles. It is caused by the electrical field at the surface of conductors. Field effects are induced currents and voltages, as well as related effects that might occur as a result of EMF at ground level.

Issues of concern identified during the original EIS and the SEIS and EIR included: human health and safety hazards from direct and cumulative EMF exposure, EMF effects on livestock, and television interference.

Corona Effects

Corona can occur on the conductors, insulators, and hardware of an energized high-voltage transmission line. Corona on conductors occurs at locations where the field has been enhanced by protrusions, such as nicks, insects, dust, or drops of water. During fair weather, the number of these sources is small, and the corona effect is less than significant. However, during wet weather, the number of these sources increases and corona effects are much greater. Effects of corona are audible noise, radio and television interference, visible light, and photochemical reactions.

- ***Audible Noise***—Corona-generated audible noise from transmission lines is generally characterized as a crackling/hissing noise. The noise is most noticeable during wet-weather conditions. Audible noise from transmission lines is often lost in the background noise at locations beyond the edge of the ROW.
- ***Radio and Television Interference***—Corona-generated radio interference is most likely to affect the amplitude modulation (AM) broadcast band (535 to 1,705 kilohertz); frequency modulation (FM) radio is rarely affected. Only AM receivers located very near to transmission lines have the potential to be affected by radio interference. Television interference from corona effects occurs during bad weather, and is generally of concern for transmission lines with a voltage of 345 kV or more and only for receivers within about 600 feet of the line.
- ***Visible Light***—Corona is visible as a bluish glow or as bluish plumes. On the transmission lines in the area, the corona levels are so low that the corona on the conductors would be observable only under the darkest conditions with the aid of binoculars.
- ***Photochemical Reactions***—When corona is present, the air surrounding the conductors is ionized and many chemical reactions take place, producing small amounts of O_3 and other oxidants. Approximately 90 percent of the oxidant is O_3, while the remaining 10 percent is composed principally of NO_x. The maximum incremental O_3 levels at ground level produced by corona activity on the transmission lines during bad weather would be less than 1 part per billion (ppb). This level is less than significant when compared to natural levels and their fluctuations.

Field Effects

The electric field created by a high-voltage transmission line extends from the energized conductors to other conducting objects such as the ground, transmission structures, vegetation, buildings, vehicles, and persons. The electric field is measured in units of kV/meter (m), at a height of 1 m above ground level. Field effects can include induced currents, steady-state current shocks, spark discharge shocks, and in some cases, field perception.

- ***Induced Currents***—When a conducting object, such as an ungrounded fence, vehicle, or person, is placed in an electric field, current and voltages are induced. The magnitude of the induced current depends on the electric-field strength and size and shape of the object. The induced currents and voltages represent a potential source of nuisance shocks near a high-voltage transmission line. Western's transmission line design practices place high-voltage transmission lines high above objects to reduce the potential for nuisance shocks. In addition, permanent structures in the ROW, such as fences, gates, and metal buildings are grounded.
- ***Spark-Discharge Shocks***—If the induced voltage was sufficiently high on an ungrounded object, a spark-discharge shock would occur as contact is made with the ground. Under

Western's transmission line design practices, the magnitude of the electric field would be low enough that this type of shock would occur rarely, if at all. Carrying or handling conducting objects, such as irrigation pipe, under transmission lines can result in spark discharges that are a nuisance. The primary hazard with irrigation pipes or any other long objects, however, is electrical flashover from the conductors if a section of pipe is inadvertently tipped up near the conductors.

- ***Steady-State Current Shocks***—Steady-state currents are those that flow continuously after a person contacts an object, such as an ungrounded fence, and provides a path to ground for the induced current. The effects of these shocks may include involuntary movement in a person.
- ***Field Perception and Neurobehavioral Responses***—When the electric field under a transmission line is sufficiently strong, it can be perceived by hair rising on the back of one's hand. At locations directly under the conductors, it is possible for some individuals to perceive the field while standing on the ground. Perception of the field does not occur at or beyond the edge of the ROW.

Magnetic Field

A 60-hertz magnetic field is created in the space around transmission line conductors by the electric current flowing in the conductors. The magnetic field is expressed in units of microteslas (µT) and in gauss or milligauss (mG), where 1 mG is one thousandth of a gauss (1 µT = 10 mG). The maximum magnetic fields of transmission lines are similar to the maximum magnetic fields measured near some common household appliances. The actual level of magnetic field would vary as the current on the transmission line and the distance to the line varies. No established health-based limits exist for peak magnetic fields. A possible short-term effect associated with magnetic fields from alternating current transmission lines is induced voltages and currents in long-conducting objects such as ungrounded fences and aboveground pipelines.

Health Effects

While there is considerable uncertainty about the EMF/health effects issue, the following facts have been established from the available information and have been used to establish Western's existing policies:

- Any exposure-related health risk to the exposed individual likely would be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns are about the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency, and maintainability, depending on the type and extent of such measures.

No Federal regulations have established environmental limits on the strengths of fields from power lines. However, the Federal government continues to conduct and encourage EMF research.

In light of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new transmission lines are similar to those from existing lines. Some states (Florida, Minnesota, New Jersey, New York, and Montana) have set specific environmental limits on one or both fields. These limits, however, are not based on any specific health effects. Most regulatory agencies believe that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

The State of California Department of Education enacted regulations that require minimum distances between a new school and the edge of a transmission line ROW. The setback distances are 100 feet from the edge of the transmission line ROW for 50- to 133-kV lines, 150 feet from the edge of the transmission line ROW for 220- to 230-kV lines, and 350 feet from the edge of the transmission line ROW for 500- to 550-kV lines. These distances were not based on specific biological evidence, but on the known fact that fields from power lines drop to near background levels at those distances. In 1993, the California Public Utilities Commission (CPUC) authorized the state's investor-owned utilities to implement "no and low-cost EMF avoidance measures" in the construction of new and upgraded utility projects. This authorization was affirmed by the CPUC in January 2006 (CPUC 2006). Western is not subject to state regulations nor is Western an investor-owned utility; however, Western has field-reducing guidelines for designing new and upgraded

transmission lines. California has no other rules governing EMF.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component, which can cause radio noise, audible noise, and nuisance shocks. The present focus is on magnetic fields, because these can penetrate building materials and potentially produce the types of health impacts at the root of the present concern. It is important for perspective to note that an individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (NIEHS 1995; DOE 1995). Scientists have not established which types of exposures would be more biologically meaningful. High-level magnetic field exposures regularly occur in areas other than the power line environment. Examples of magnetic fields at particular distances from household appliance surfaces are listed in Table 4.4-1.

4.4.1.3 Characterization

The proposed Project would involve construction of 230-kV transmission lines, in various configurations: single-, double-, and parallel single-circuit lines. EMF measured under the lines and at the edge of the ROW would vary, depending upon the configuration of the circuits and operation of the lines. Circuits placed parallel to each other tend to cancel EMF, thus reducing the measured fields under the lines and at the edge of the ROW. Fields and currents can be induced on nearby ungrounded fences, irrigation pipes, and other metallic objects.

4.4.2 Environmental Consequences

4.4.2.1 Standards of Significance

A significant effect from EMF would occur under the following conditions:

- EMF avoidance practices are not conducted in the design and operation of the transmission line.
- The distance between the edge of ROW and the edge of the property line of an existing or an approved school site is less than 150 feet.

4.4.2.2 Environmental Protection Measures

EPM Number 61 for EMF is listed in Table 3-3. It states that Western would respond to complaints of radio or television interference generated by the transmission line and would take appropriate actions.

SMUD has an established EMF program and policy. The program includes the following:

- SMUD will continue to follow studies of EMF.
- As results become available, customer owners and employees will be informed through public workshops and publications.

Table 4.4-1. Magnetic Fields from Household Appliance Surfaces

Appliance	Milligauss at 1 foot	Milligauss at 3 feet
Can opener	7.19 to 163.02	1.3 to 6.44
Clock	0.34 to 13.18	0.03 to 0.68
Clothes iron	1.66 to 2.93	0.25 to 0.37
Coffee machine	0.09 to 7.30	0 to 0.61
Computer monitor	0.20 to 134.7	0.01 to 9.37
Dishwasher	4.98 to 8.91	0.84 to 1.63
Fax machine	0.16	0.03
Portable fan	0.04 to 85.64	0.03 to 3.12
Range	0.60 to 35.39	0.05 to 2.83
Television	1.80 to 12.99	0.07 to 1.11

Source: Zaffanella 1997

- Pending definite results of the research, SMUD will adopt practices, where practical, which will minimize potential EMF exposure from new transmission and distribution facilities.
- SMUD will actively support and participate in research projects and electric utility groups studying the relationship between EMF and human health.

SMUD's EMF policy will include the practice of "prudent avoidance" which can help reduce customer's exposure to EMF while the research continues. SMUD's practice of prudent avoidance will include:

- Designing and building future SMUD transmission and distribution facilities to limit EMF levels.
- Providing information to concerned customer-owners and employees about measures they can take to reduce their exposure to EMF.
- Advising designers and contractors on the placement of electrical equipment in new buildings.
- Loaning meters to customer-owners and employees to survey magnetic fields in their homes and businesses.
- Dedicating an Environmental Specialist to follow EMF studies and answer customer and employee's prudent avoidance and EMF questions.
- Providing an EMF answer-line which connects customers directly to SMUD's Environmental Specialist.
- SMUD staff shall keep the Board of Directors informed about the implementation of this program including costs and results of ongoing EMF research.

4.4.2.3 Impacts from Alternatives

Western follows Federal laws and regulations for designing, constructing, maintaining, and operating its transmission lines. Impacts from proposed Project alternatives would be relatively similar. A discussion of the impacts from EMF effects is presented below:

- ***Audible Noise***—No design-specific Federal regulations exist to limit audible noise from transmission lines. No noise codes are applicable to transmission lines in California. Audible noise from transmission lines associated with proposed Project alternatives is limited instead through design and maintenance standards established from industry research and experience as effective without significant impacts on line safety, efficiency, maintainability, and reliability.

  Noise levels depend on the strength of the line electric field. The potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet weather and from lines 345 kV or higher. Research by EPRI (1982) validated this by showing the fair weather audible noise from modern transmission lines of less than 500 kV to be indistinguishable from background noise at the edge of a 100-foot ROW.

Several studies have been conducted related to the potential health effects of fields. A summary of some of those studies follows.

Paper by Dr. Sander Greenland, "A Pooled Analysis of Magnetic Files, Wire Codes, and Childhood Leukemia"

A paper by Dr. Sander Greenland (University of California, Los Angeles) and colleagues entitled "A Pooled Analysis of Magnetic Fields, Wire Codes, and Childhood Leukemia" (Greenland 2000) was published in the journal *Epidemiology*. The work was funded by NIEHS (EPRI 2000).

The authors concluded:

— An effect of magnetic fields below 0.3 µT (3 [mG]) is unlikely or too small to detect in epidemiological studies.

— There is suggestive evidence that an association between magnetic fields greater than 0.3 µT (3 mG) and childhood leukemia exists.

— Magnetic fields show a more constant association with childhood leukemia than wire code does.

— Future studies of EMF and childhood leukemia should focus on highly exposed populations.

NATIONAL ENVIRONMENTAL HEALTH SCIENCE REPORTS

In June 1999, the National Institute of Environmental Health Sciences (NIEHS) released its report, Health Effects from Exposure to Power-line Frequency Electric and Magnetic Fields (NIEHS 1999). The report's Executive Summary concludes that "extremely-low-frequency electric and magnetic field (ELF-EMF) exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion (NIEHS), this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the U.S. uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or noncancer health outcomes provide sufficient evidence of a risk to currently warrant concern." Nevertheless, the report goes on to recommend some actions: "In summary, the NIEHS believes that there is weak evidence for possible health effects from ELF-EMF exposures, and until stronger evidence changes this opinion, inexpensive and safe reductions in exposure should be encouraged (Electric Power Research Institute [EPRI] 1999)."

The NIEHS report, submitted to Congress, is the culmination of a long-term commitment under the Research and Public Information Dissemination (RAPID) Project, which began with the Energy Policy Act of 1992. RAPID's objective was to accelerate applied EMF research with a focused program supported by matching funds from the Federal government and the private sector. The electric utility industry provided most of the private sector funds.

The most significant source for the NIEHS report was the NIEHS Working Group (The Working Group) Report, which resulted from a 9-day meeting in June 1998. The Working Group considered all literature to be relevant to the potential effects of power-frequency electric and magnetic fields on health, including cancers of several types, adverse pregnancy outcomes, chronic illnesses (for example, Alzheimer's disease and amyotrophic lateral sclerosis), and neurobehavioral changes (for example, depression, learning, and performance). The Working Group found limited support for a causal relationship between childhood leukemia and residential exposure to EMF, and between adult chronic lymphocyte leukemia and employment on jobs with potentially high magnetic field exposure. Based on this assessment and charged with ranking EMF according to International Agency for Research on Cancer criteria, the Working Group assigned EMF a 2B ranking, which translates to "possible human carcinogen." For all other health outcomes, the Working Group concluded that the evidence was inadequate.

Although regulatory actions are not in the purview of NIEHS, they suggest "the power industry continue its current practice of siting power lines to reduce exposures and continue to explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards. We also encourage technologies that lower exposures from neighborhood distribution lines provided that they do not increase other risks, such as those from accidental electrocution or fire."

Paper by Dr. Anders Ahlbom, Karolinska Institute, Sweden, "Childhood Leukemia and Electromagnetic Radiation - A Review of Epidemiological Studies"

A paper describing the results of a pooled analysis of magnetic fields and childhood leukemia was published in the September 2000 issue of *British Journal of Cancer*. Dr. Anders Ahlbom (Karolinska Institute, Sweden) and colleagues conducted the analysis funded by the European Union (Ahlbom 2000). This pooled analysis is based on original, individual-level data, unlike meta-analysis, which is based on published results combined from previous epidemiological studies to examine whether there is an association between magnetic fields and leukemia (EPRI 2000).

The authors concluded:

— "We did not find any evidence of an increased risk of childhood leukemia at residential magnetic field levels less than 0.4 µT (4 mG). However, we did find a statistically significant relative risk estimate of two for childhood leukemia in children with residential exposure to EMF greater than 0.4 µT (4 mG) during the year before diagnosis. Less than one percent of subjects were in this highest exposure category. The results did not change following adjustment for the potential confounders. In addition, the existence of the so-called wire code paradox could not be confirmed."

— "The explanation for the elevated risk is unknown but selection bias may have accounted for some of the increase."

Report by the Department of Health Services, State of California, "An Evaluation of the Possible Risks from Electric and Magnetic Fields from Power Lines, Internal Wiring, Electrical Occupations, and Appliances"

In response to a requirement of the California Public Utilities Commission, the California Department of Health Services (DHS) initiated research on the possible health effects of electric and magnetic fields created by the use of electricity. While the report does not include recommendations on how to protect against the identified health risks, it does recommend further research.

The final report, dated June 2002, asked three DHS scientists to review studies to examine the potential biological and health effects resulting from EMF exposure. The scientists made the following conclusions:

— To one degree or another, all three of the DHS scientists are inclined to believe that EMF can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig's Disease, and miscarriage.

— They strongly believe that EMFs do not increase the risk of birth defects, or low birth weight.

— They strongly believe that EMFs are not universal carcinogens, because there are a number of cancer types that are not associated with EMF exposure.

— To one degree or another, they are inclined to believe that EMFs do not cause an increased risk of breast cancer, heart disease, Alzheimer's Disease, depression, or symptoms attributed by some to sensitivity to EMF.

— All three scientists had judgments that were "close to the dividing line between believing and not believing" that EMFs cause some degree of increased risk of suicide.

— For adult leukemia, two of the scientists are "close to the dividing line between believing or not believing" and one was "prone to believe" that EMFs cause some degree of increased risk.

Report by the United Kingdom National Radiological Protection Board, "Review of the Scientific Evidence for Limiting Exposure to Electromagnetic Fields (0-300 GHz)"

In 2004, at the request of the UK Department of Health, the National Radiological Protection Board (NRPB) published the "Review of the Scientific Evidence for Limiting Exposure to Electromagnetic Fields (0-300 GHz)" (NRPB 2004). Conclusions of the review include:

— Power frequency magnetic fields have no effect on human chromosomes and therefore are very unlikely to cause cancer. Research found no support for the hypothesis that there is a causal connection between magnetic fields and childhood leukemia.

— Exposure for long periods to magnetic fields significantly stronger than those near power lines or domestic appliances produced no evidence of damage to chromosomes leading to aberrations, nor any change in the deoxyribonucleic acid (DNA) repair mechanisms that operate after damage caused by a mutagenic agent (typically DNA damage produced by gamma radiation).

— At the cellular level, there is no clear evidence that exposure to power frequency EMF at levels likely to be encountered can affect biological processes that are implicated in causing cancer.

For the proposed Project, low-corona design would minimize the potential for corona-related audible noise. This means upgraded, modified, and new transmission lines would add a small incremental noise level to existing background noise levels.

- ***Radio and Television Interference***—Transmission line-related radio frequency interference is an indirect effect of line operation produced by the physical interactions of line electric fields. The level of interference usually depends on the magnitude of the electric fields involved. The potential for such interference is usually only of concern for transmission lines of 345 kV and above and not the 230-kV transmission lines associated with the proposed Project. The lines would be constructed according to Western's standards, which minimize the potential for surface irregularities (nicks and scratches on the conductor), sharp edges on suspension hardware, and other irregularities.

  However, if such interference occurred, Western would implement practices to eliminate it such as by appropriate line maintenance and antenna modification.

- ***Visible Light***—On the transmission lines for the proposed Project, the corona would be similar to those on existing lines. The visible corona on the conductors would be seen only under the darkest conditions with the aid of binoculars and would not be significant.

- ***Photochemical Reactions***—The maximum incremental O_3 levels at ground level produced by corona activity on the new transmission lines would be similar to that produced by existing lines in the area. During rain or fog, O_3 produced would be less than 1 ppb. This level is less than significant when compared to natural levels and their fluctuations.
- ***Induced Currents***—The magnitude of the induced currents depends on the electric field strength and size and shape of the object. Under Western's transmission line design practices, high-voltage transmission lines are placed high above objects on the ground to reduce the potential for these shocks. In addition, permanent structures in the ROW, such as fences, gates, and metal buildings, would be grounded. Induced currents would be less than significant for the proposed Project.
- ***Steady-State Current Shocks***—The proposed Project would be constructed according to Western's design practices to prevent hazardous shocks from direct or indirect human contact with overhead energized line. Western would also follow National Electrical Safety Code standards to prevent shock. Therefore, these lines are not expected to pose any such hazards to humans.
- ***Spark-Discharge Nuisance Shocks***—Under Western's transmission line design practices, the magnitude of the electric field would be low enough that this type of shock would occur rarely, if at all. Under current Western practice, the potential for nuisance shocks would be minimized through standard grounding procedures. Ensuring adequate ground clearance would minimize the potential for the electrical charging.
- ***Field Perception and Neurobehavioral Responses***—Perception of the field associated with the new transmission lines would not be detected beyond the edge of the ROW. Persons working within the ROW (for example, farmers) might feel the field. Studies of short-term exposure to electric fields have shown that some people may perceive fields (such as felt movement of arm hair) at levels of about 2 to10 kV/m, but studies of controlled short-term exposures to even higher levels in laboratory studies have shown no adverse effects on normal physiology, mood, or ability to perform tasks. The International Commission on Non Ionizing Radiation Protection (ICNIRP 1990) guidelines propose that short-term exposures be limited to 10 kV/m for the general public. This level could occur directly below the proposed transmission line but would decrease with distance from the centerline.
- ***Magnetic Fields***—The maximum magnetic fields of the transmission lines for the proposed Project would be comparable with the maximum magnetic fields measured near some common household appliances (NIEHS 1995; DOE 1995). The actual level of magnetic field would vary as the current on the transmission line varies and as the height of the line above ground varies. No established regulatory limits exist for peak magnetic fields.

Siting and designing transmission lines incorporates prudent avoidance of residences, schools, hospitals, and other facilities where people may reside for extended periods of time. For this project, sensitive receptors would be avoided. Transmission lines would not pass within 150 feet of any existing or proposed new school sites. The Elverta Joint Elementary School is the nearest school or daycare center to any of the segments and is located about 1,000 feet from the termination of Segment $2C_2$. Therefore, potential exposure to EMF is less than significant.

The medical and scientific communities generally agree that the available research evidence has not demonstrated that EMF creates a health risk. However, they also agree that the evidence has not dismissed the possibility of such a risk. Finally, they agree that while this is an important issue that needs resolution, it is uncertain when such a resolution will occur. The present scientific uncertainty means that public health officials cannot establish any standard or level of exposure that is known to be either safe or harmful.

4.4.2.4 Impacts from the No Action Alternative

Under the No Action Alternative, power shortages would be more frequent than shortages under the proposed Project. No changes to existing EMF conditions would be expected.

4.4.2.5 Cumulative Impacts

No environmental standards or any health-based standards exist that indicate that EMF is a risk from

past, present, and future transmission lines and this proposed Project would not contribute to a cumulative impact.

4.4.2.6 Summary of Impacts

No significant direct, indirect, or cumulative impacts from EMF would be expected from any of the proposed Project alternatives.

4.5 ENVIRONMENTAL JUSTICE

This section analyzes the distributional patterns of high-minority and low-income populations within census blocks and characterizes the distribution of such populations as they relate to the proposed Project. This analysis focuses on whether Project impacts have the potential to affect high-minority populations and low-income communities disproportionately, thus creating an adverse environmental justice (EJ) impact.

On February 11, 1994, President Clinton issued an "Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" 59 FR 7629 (1994), designed to focus attention on environmental and human health conditions in areas of high-minority populations and low-income communities and to promote non-discrimination in programs and projects substantially affecting human health and the environment. Executive Order 12898 requires agencies to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

In 1997, the EPA's Office of Environmental Justice released the Environmental Justice Implementation Plan, supplementing the EPA EJ strategy and providing a framework for developing specific plans and guidance for implementing Executive Order 12898. Federal agencies received a framework for the assessment of EJ in the EPA's Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis in 1998. This approach emphasizes the importance of selecting an analytical process appropriate to the unique circumstances of the potentially affected community. Minority populations, as defined by this guidance document, are identified where either:

- The minority population of the affected area is greater than 50 percent of the affected area's general population; or
- The minority population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

Consistent with the definition of minority populations, many EJ analyses in environmental review documents apply the 50-percent threshold to the identification of low-income populations as well. Specifically, low-income populations are identified where either:

- The low-income population of the affected area is greater than 50 percent of the affected area's general population; or
- The low-income population percentage of the area is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis.

The State of California has a number of legislative actions associated with EJ. For example, under Assembly Bill 1553 (signed in 2001), the Governor's Office of Planning and Research is required to adopt guidelines for addressing EJ issues in local agencies' general plans.

4.5.1 Affected Environment

4.5.1.1 Resource Study Area

The EJ study area includes census blocks that are within 0.5 mile of the centerline along segment corridors. A large portion of the proposed Project area would traverse private property or run along existing easements owned by Western. The EJ study area includes both urban and rural areas, including the Sacramento metropolitan area.

4.5.1.2 Issues of Environmental Concern

EJ considerations focus on the potential for disproportionate impacts resulting from Federal activities on minority populations, low-income communities, and tribes. Impacts could occur temporarily during construction and for the long term after construction.

4.5.1.3 Characterization

Minority Populations. For the purposes of this analysis, U.S. Census Year 2000 minority population data is presented by census block to characterize the ethnic makeup of the study area. The U.S. Census defines minorities as individuals who are members of the following population

groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic. Table 4.5-1 provides population percentages for the minority populations within census blocks presented in Figure 4.5-1.

Three census blocks within the study area contained minority populations greater than 50 percent, but as a whole, only 31.7 percent of the census blocks in the study area contained more than 50 percent minority populations. About 34 percent of the Segment 1 study area traversed census blocks with more than 50 percent minority populations. Segments 2A1, 2A2, 2A3, 2A4, 2A5, 2B, and 2C did not traverse any census blocks that contained more than 50 percent minority populations. Segment 3 ends about 0.5 mile from a census block with a minority population greater than 50 percent.

Low-Income Populations. The U.S. Census Bureau defines low-income populations by comparing the household income of a given area to that same area's weighted poverty thresholds established by the U.S. Department of Finance (U.S. Census 2006). Table 4.5-2 presents the low-income population profile for census blocks presented in Figure 4.5-2. None of the study area traverses census blocks with low-income populations that exceeded 50 percent; in fact, the highest percentage low-income population in a study area census block was 28.9 percent.

4.5.2 Environmental Consequences

4.5.2.1 Standards of Significance

A significant effect to EJ would occur under the following condition:

- Low-income or minority populations in the study area are disproportionately affected.

4.5.2.2 Environmental Protection Measures

EPMs described in the air quality, cultural resources, EMF, health and safety, noise impact assessments, and socioeconomic sections would help minimize and avoid adverse impacts to minority and low-income populations (see Table 3-3).

Table 4.5-1. Study Area Minority Population Profile by Census Block

Figure 4.5-1 Identification	Census Block	Population	Minority Population	Percent Minority
1	60670070011	1,442	865	60.0
2	60670070081	982	255	26.0
3	60670071002	220	47	21.4
4	60670071001	890	323	36.3
5	60670072083	449	22	4.9
6	60670072081	665	147	22.1
7	60670072064	704	116	16.5
8	60670072063	840	163	19.4
9	60670072062	707	128	18.1
10	60610213012	1,012	161	15.9
11	61010511004	851	180	21.2
12	61010511003	363	141	38.8
13	61010511002	663	97	14.6
14	61010510001	1,108	572	51.6
15	61010509004	317	136	42.9
16	61010509003	253	158	62.5
17	61010510002	1,356	551	40.6
18	61010509001	381	127	33.3
TOTAL	**NA**	**13,203**	**4,189**	**31.7**

Source: 2000 U.S. Census

Table 4.5-2. Study Area Low-Income Population Profile by Census Block

Figure 4.5-2 Identification	Census Block	Population for Whom Poverty was Determined	Income Below Poverty Level	Percent Low-Income
1	60670070011	1,414	408	28.9
2	60670070081	982	47	4.8
3	60670071002	220	12	5.5
4	60670071001	885	121	13.7
5	60670072083	449	37	8.2
6	60670072081	642	80	12.5
7	60670072064	704	71	10.1
8	60670072063	840	92	11.0
9	60670072062	691	83	12.0
10	60610213012	1,012	87	8.6
11	61010511004	851	161	18.9
12	61010511003	363	71	19.6
13	61010511002	663	58	8.8
14	61010510001	1,108	284	25.6
15	61010509004	317	20	6.3
16	61010509003	253	44	17.4
17	61010510002	1,354	241	17.8
18	61010509001	381	90	23.6
TOTAL	**NA**	**13,129**	**2,007**	**15.3**

Source: 2000 U.S. Census

4.5.2.3 Impacts from Alternatives

Construction and operation of the proposed Project would not result in disproportionate impacts on minority and/or low-income populations. The study area covers 18 census blocks in portions of Placer, Sacramento, and Sutter counties with a combined minority population of 4,189 (31.7 percent). Segment 1 is common to each alternative and traverses two census blocks with high minority populations. Segment 3 is common to each alternative and is near one census block with high minority populations. The majority of Segments 1 and 3 (73 percent) traverse areas that do not contain high minority populations; therefore, environmental impacts associated with construction or operations would not disproportionately affect minority populations in the Project area.

The study area contains 2,007 low-income individuals in the workforce or 15.3 percent of the study area population. Because the potentially affected low-income population accounts for such a small percentage, environmental impacts associated with construction or operations would not disproportionately affect the low-income populations in the study area.

Participation in the proposed Project by Indian tribes and other potentially affected minorities and the effects of potential rate increases were issues identified during the public scoping process. Rate increases might affect low-income populations more than others. While rate increases are not included in the proposed Project, they could occur as a result of the added cost of improving Western's and SMUD's transmission systems.

A number of sections in this SVS Draft SEIS and EIR have identified less-than-significant impacts resulting from Project construction and implementation, including air resources, cultural resources, EMF, floodplains, geology, health and safety, noise, paleontology, socioeconomics, soils, traffic, and water resources. Implementation of EPMs would result in less-than-significant impacts for Project construction and operations for biological resources, land use, and wetlands. Impacts appear to affect each alternative relatively equally. Therefore, no environmental impacts would be disproportionately distributed to minority populations in the proposed Project area.

4.5.2.4 Impacts from the No Action Alternative

Under the No Action Alternative, power outages may be more frequent than outages under the proposed Project. Power outages can have a disproportionate impact on low-income and minority workers with hourly wages, as opposed to salaries, who work for manufacturing and other businesses particularly affected by disruptions in power service. This impact likely would be less than significant.

4.5.2.5 Cumulative Impacts

Currently, the overall study area does not contain a minority or low-income population greater than 50 percent. Past and present land use in the proposed Project area was primarily agricultural. The Sacramento Valley has seen population growth for the last 20 years and development is expected to continue in Sutter and Placer counties and to extend north from the city of Sacramento into the study area, as further discussed in Section 4.9. Foreseeable development would increase construction employment, housing, and tax base within the study area. Therefore, the cumulative impacts would be beneficial to the socioeconomics of the area.

4.5.2.6 Summary of Impacts

No significant direct, indirect, or cumulative impacts to environmental justice would result from the proposed Project or the No Action Alternative.

4.6 FLOODPLAINS

4.6.1 Affected Environment

This section describes existing floodplain conditions within the study area and how the proposed Project alternatives would affect floodplains. Floodplains perform the natural, vital function of conveying and dissipating the volume and energy of peak, surface runoff flows downstream. Periodic flood flows form and sustain specific habitat types (such as wetland and riparian areas) within the floodplains (see Section 4.2 for a discussion of habitat types and Section 4.17 for wetlands). Environmental regulations have been developed to preserve unimpaired flood flows through established floodplains, prevent flood-related damage to downstream resources, and protect unique habitat types and species. These regulations include EO 11988 and Floodplain Management (42 *Federal Register* [FR] 26951, May 24, 1977). DOE has established procedures for compliance with EO 11988 at 10 CFR Part 1022.

4.6.1.1 Resource Study Area

The study area includes floodplain portions of the Sutter Bypass, Feather River, and associated smaller tributary floodplains crossed by or along the proposed Project transmission ROW alignments.

Floodplains within the study area were determined by reviewing the Federal Emergency Management Agency (FEMA) maps of delineated floodplains. Floodplains for the larger tributaries are constrained by levees to prevent extensive overbank flooding and convey peak flows downstream. In some locations, the levees have been set back, expanding the area available to flooding to reinstate a more natural local flood regime.

4.6.1.2 Issues of Environmental Concern

The issue of concern is that structure footings and access roads may alter or impair the ability of floodplains to convey or obstruct flows, decrease bank stability, and increase erosion. Reduced floodplain capacity may adversely impact lives and property downstream, as well as a wide variety of natural resources downstream. There are two types of floodplains in the study area: (1) the 100-year floodplain has a 1 percent chance of flooding in any given year and (2) the 500-year floodplain has a 0.2 percent chance of flooding in any given year. This likelihood of occurrence is based on historic hydrology; future flood flows may be more or less frequent.

4.6.1.3 Characterization

Segment 1; Segments 2A1, 2A2, 2A3, 2A4, 2A5, 2B, and $2C_1$; and Segment 3 cross through the 100- and 500-year floodplains of the various watercourses

between O'Banion and Natomas Substations. Figure 4.6-1 shows segment alignments within floodplains. Table B-1 in Appendix B summarizes acreage crossed by each segment within the 100- and 500-year floodplains.

All of Segment 1 is within either a 100- or 500-year floodplain. O'Banion Substation is within the 100- and 500-year floodplains. From MP 0.0 to 8.9, the segment follows the Sutter Bypass which is the border between the 100- and 500-year floodplain designations. The 100-year floodplain is on the west side of the alignment, and the 500-year floodplain on the east side of the alignment. The majority of Segment 1 is within the 500-year floodplain. The Sutter Bypass carries excess flood flows from the Sacramento River and discharges these waters to low-lying areas. From MP 8.9 to 10.8, the segment crosses a 500-year floodplain, and from MP 10.8 to 11.6, it crosses the 100-year floodplain associated with the Feather River. The alignment between MP 11.8 and 17.0 is within a 500-year floodplain, primarily crossing rice fields protected by levees and spanning Coon Creek at MP 13.3.

Segments 2A1 through 2A5 proceed along Cross Canal, which is the border between the 100- and 500-year floodplains. The 100-year floodplain is on the south side of the alignment, and the 500-year floodplain is on the north side of the alignment. The 2A segments lie completely within the 100-year floodplain south of Cross Canal.

Segment 2B lies in the 100-year floodplain from MP 0.0 to 6.0, MP 6.5 to 7.1, and MP 7.9 to 9.4. The remaining portions of the alignment fall outside of the 100- and 500-year floodplain.

Segment $2C_1$ crosses the 100-year floodplain from MP 0.0 to 3.0 and MP 3.5 to 4.5. The alignment crosses two perennial creeks and their associated 100-year floodplains at MP 5.9 and 7.5 and lies within the 100-year floodplain from MP 8.0 to 9.6.

Segment $2C_1$ ends near the Elverta Substation located within the 100-year floodplain. The remaining portions of the alignment fall outside of the 100- and 500-year floodplain. Segment $2C_2$ is outside of the 100- and 500-year floodplain.

Natomas Substation and Segment 3 lie completely within the 100-year floodplain, except for 0.3 acre of Segment 3 that is outside of the 100- and 500-year floodplain at MP 0.5.

4.6.2 Environmental Consequences

The proposed Project would impact floodplains during and following construction of new access roads, structures, and temporary work sites within existing and new ROW. Activities that result in additional fill within, or block water movement through, the floodplain could reduce its capacity to dissipate the energy and volume of peak flows.

4.6.2.1 Standards of Significance

A significant effect to floodplains would occur under the following conditions:

- Increased susceptibility to on-site (in the study area) flooding as a direct result of the proposed Project.
- Increased damage associated with floods due to the presence of the facility.
- Increased stage or extent of flood event.

4.6.2.2 Environmental Protection Measures

EPMs for floodplains from Table 3-3 include the following:

26. Hazardous materials would not be drained onto the ground or into streams or drainage areas. All construction and maintenance waste would be removed daily. This would include trash and litter, garbage, other solid waste, petroleum products, and other regulated materials. The materials would be sent to a disposal facility authorized to accept such materials.

59. Direct impact to irrigation system and drainage canal features that are eligible for the NRHP, would be avoided during the siting of new transmission line structures and access roads, and most other irrigation system features would be avoided to the extent practicable in siting new structures and access roads.

62. Surface restoration would occur in construction areas, material storage yards, structure sites, spur roads, and existing access roads where ground disturbance occurs or where recontouring is required.

63. Access roads would be built at right angles to streams and washes to the extent practicable. Culverts would be installed where needed. All construction activities would be conducted to minimize disturbance to vegetation and drainage channels.
64. Excavated material or other construction materials would not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters.
65. Non-biodegradable debris would be collected and removed from the ROW daily and taken to a disposal facility. Slash and other biodegradable debris would be left in place or disposed of.
66. All soil excavated for structure foundations would be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations. Excess soil would be removed from the site and disposed of appropriately. Areas around structure footings would be reseeded with native plants.
67. Wherever possible, new structures and access roads would be sited out of floodplains. Because of the abundance of floodplains and surface water resources in the study area, complete avoidance may not be possible and Western would consult with USACE.

4.6.2.3 Impacts from Alternatives

Disturbances to 100- and 500-year floodplains are presented in Table B-1 in Appendix B to compare alternatives. Short-term disturbances would result from construction of material storage yards, access roads, structures, and pulling sites. Long-term disturbances would result from structure foundations and access roads. The proposed Project would result in construction disturbances between 20.0 and 53.9 acres and 55.0 and 57.1 acres in the 100- and 500-year floodplain, respectively. The proposed Project would result in long-term disturbances between 5.8 and 26.5 acres and 30.5and 31.7acres in the 100- and 500-year floodplain, respectively. There would be no difference in floodplain impacts between the route options east and west of State Route (SR) 99.

To prevent increased susceptibility to flooding as a direct result of the proposed Project, surface restoration would occur in construction areas where ground disturbance occurs or where recontouring is required. All soil excavated for structure foundations would be backfilled and tamped around the foundations and used to provide positive drainage around the structure foundations. Native seed mixture would be planted around structure footings to promote revegetation. Western would remove excess excavated soil from the site and dispose of it appropriately. The amount of available floodplain within and surrounding the area would completely absorb any change resulting from such modifications. For each of the alternatives, these negligible changes to the 100- and 500-year floodplains would not alter the capacity of the floodplain to convey and dissipate the volume and energy of peak flows. Therefore, the proposed Project would not increase the stage or extent of a flood.

Access roads may require grading, vegetation clearing, and/or installation of culverts. The majority of access roads would be located within the100-year floodplain and could potentially provide long-term impacts to the storage volume capacity and flow of the natural floodplain. However, the flood management program in the proposed Project area is capable of accepting the increase in flood flow and volume. Implementation of the EPMs would result in a less-than-significant impact.

If a flood event occurred during construction or maintenance activities, there could be an increase in sediment discharge from the site and a decrease in bank stability that could potentially obstruct, impede, or interfere with the natural flow of the water system. Implementation of the EPMs would result in a less-than-significant impact.

4.6.2.4 Impacts from the No Action Alternative

Without the proposed Project, no changes to existing facilities or alignment would occur and no new impacts to the floodplain would be expected. Normal operation and maintenance, repairs, and emergency management of the system would likely increase in frequency. There are recognized temporary and insignificant impacts from maintaining access and transmission service (for example, vegetation management within the ROW). These impacts would continue as before or be avoided or minimized to the extent possible using EPMs. The No Action Alternative would not increase the susceptibility to on-site flooding.

4.6.2.5 Cumulative Impacts

Past projects included levees, first built by early settlers to the Sacramento Valley to protect homes and farmlands from floodwaters. These levees were often overtopped and the situation worsened with hydraulic mining, which clogged river channels with debris and silt, reducing the river's capacity to carry water. The remedy was to build a levee system close to the channel, thereby keeping the water velocity high enough to scour away the sediment resulting in reduction of natural floodplains. In response to increased urban and agricultural development over the past 150 years, the Sacramento Flood Control Project currently provides flood control protection by maintaining the levee system.

Foreseeable future projects in the study area include numerous residential and commercial developments that would result in substantial construction within floodplains. The proposed Project would contribute a minor amount to cumulative impacts to the 100- and 500-year floodplains. Local planning agencies and their boards and commissions determine the magnitude, location, and nature of future growth, which may alter existing floodplains in the study area. Further development may result in changes to existing floodplains. However, the appropriate authorities would evaluate new projects and approved them on a case-by-case basis. The proposed Project would provide a minimal cumulative contribution to floodplain impacts.

4.6.2.6 Impacts Summary

While minor differences exist in the levels of disturbance to the 100- and 500-year floodplains among alternatives, no significant direct, indirect, or cumulative impacts are expected from any of the alternatives.

4.7 GEOLOGY

4.7.1 Affected Environment

This section describes the existing geologic and hydrogeologic conditions within the proposed Project area and potential impacts the proposed Project alternatives may have on these resources.

4.7.1.1 Resource Study Area

The focus of the study for geologic constraints and hazards is the transmission line ROW and nearby geologic faults, including the Willows fault, that could potentially affect the transmission lines.

4.7.1.2 Issues of Environmental Concern

Issues of environmental concern for geological resources include erosion, subsidence, landslides, and seismic and related hazards (liquefaction).

4.7.1.3 Characterization

Regional Setting

The study area lies within the Central Valley of California, a broad depositional basin located between the Sierra Nevada Mountains on the east and the Coast Mountain Range on the west. The Central Valley is about 400 miles long by 50 miles wide, covers about 20,000 square miles, and contains the Sacramento Valley. The surface elevation of the Central Valley lowland rises from slightly below sea level to about 400 feet above sea level at its north and south ends. The valley is unusual for a lowland area because it is a relatively undeformed basin surrounded by highly deformed rock units. The northern half of the Central Valley where the proposed Project is located is known as the Sacramento Valley. The Central Valley rough has been filled with 10 vertical miles of deposits in the Sacramento Valley. These sediments range in age from Jurassic to Holocene. The Sacramento River drains the northern part of the Sacramento Valley.

The geology in the Sacramento Valley relates to three different subbasins within the Sacramento Groundwater Basin: (1) the North American Subbasin, (2) the South American Subbasin, and (3) parts of the Cosumnes Subbasin.

The North American Subbasin lies in the east central portion of the Sacramento Groundwater Basin. The Bear River is its north boundary, the Feather River is its west boundary, and the Sacramento River is its south boundary. The east boundary is a north-south line extending from the Bear River south to Folsom Lake. The east boundary represents the approximate edge of the alluvial basin, where little or no groundwater flows into or out of the groundwater basin from the rock of the Sierra Nevada. The east portion of the study area is characterized by low, rolling dissected uplands. The west portion is nearly a flat flood basin for the Bear, Feather, Sacramento and American rivers, and several small east side tributaries. The general direction of drainage is west to southwest at an average grade of about 5 percent (DWR 2004).

The South American Subbasin is bounded on the east by the Sierra Nevada, on the west by the Sacramento

River, on the north by the American River, and on the south by the Cosumnes and Mokelumne rivers. These perennial rivers generally create a groundwater divide in the shallow subsurface. There is interaction between groundwater of adjacent subbasins at greater depths (DWR 2004).

The Cosumnes Subbasin is the area of unconsolidated to semi-consolidated sedimentary deposits bounded on the north and west by the Cosumnes River, on the south by the Mokelumne River, and on the east by consolidated bedrock of the Sierra Nevada Mountains. The Cosumnes Subbasin is bounded on the south and southwest by the Eastern San Joaquin Subbasin and on the north to northwest by the South American Subbasin of the Sacramento Valley Groundwater Basin. The subbasin drains westward through three major rivers, namely the Cosumnes on the north, Dry Creek in the middle, and the Mokelumne River on the south. A large surface water body, the Camanche Reservoir, is located along a portion of the Mokelumne River in the southeast part of the subbasin (DWR 2004).

Geologic Formations in the Study Area

The proposed Project alignment crosses three geologic formations (at land surface) between the O'Banion and Natomas substations. Figure 4.7-1 shows the geology units that surround the study area. These Quaternary and Tertiary deposits include:

- ***Quaternary Floodbasin (Qb)***—Floodbasin deposits associated with flood stage on major streams;
- ***Quaternary River Deposit (Qr)***—River deposits associated with river channels, floodplains and natural levees; and
- ***Quaternary Continental Deposit (QTc)***—Continental deposits (older alluvium, fanglomerate, and sedimentary formations).

Floodbasin deposits (Qb) crop out in low-lying areas throughout the Central Valley. They result from flood waters entering low-lying basins and depositing mostly fine silt and clay and some fine sand. Floodbasin deposits grade into river deposits, rocks, deposits of Tertiary and Quaternary age, and lacustrine and marsh deposits. As with most deposits of Quaternary age in the valley, contact with underlying deposits is difficult to determine. Floodbasin deposits in the Sacramento Valley consist of as much as 160 feet of fine-grained sediments in the area west and south of Sacramento (DWR 2004). In the San Joaquin Valley, the deposits are estimated to be as much as 100 feet thick (Page 1986).

River deposits (Qr) crop out along the major rivers and streams of the Central Valley and include channel and floodplain deposits. River deposits are still accumulating, except where human activity intervenes. Channel deposits, which consist chiefly of sand and gravel, range in width from a few feet to nearly 1,000 feet. Floodplain deposits generally are finer-grained than channel deposits and consist chiefly of sand and silt. They range in width from a few hundred feet to more than 3 miles. Because soil development and topography are the criteria for mapping river deposits, subsurface contact with underlying deposits is poorly defined. River deposits in the Sacramento area are predominantly coarse-grained at relatively shallow depths that appear to be hydraulically continuous with the present stream channels, floodplains, and natural levees. River deposits are a maximum of about 115 feet thick (DWR 2004) and are the most permeable deposits in the Sacramento Valley.

Continental deposits (QTc) are largely of Holocene age; along their outer margins, however, some may be Pleistocene age. The deposits crop out chiefly along the major rivers and streams of the valley, as well as in other low-lying areas, and include river deposits, floodbasin deposits, and sand dunes, all of Holocene age. In places, they may include such deposits as the Modesto Formation of Pleistocene age (Page 1986).

Figure 4.7-1 presents geological deposits in the vicinity of the study area. Segments of transmission lines in relation to local geology are described below.

River deposits pose the greatest concern for building or accessing transmission lines. The deposits consist of sand and gravel, usually unconsolidated; are typically water-bearing; and are poor for compaction and drilling. River deposits along the ROW are approximately perpendicular to the route because they follow the rivers west from the Sierra Nevada Mountains. Segment 1 crosses about 3.3 miles of river deposits along the Feather River.

Continental deposits are the most geologically stable and are most prevalent along the study area in Sacramento County. Continental deposits are present in 24.2 miles of Alternative A1; 21.3 miles of Alternative A2; 19.9 miles of Alternative A3;

19.3 miles of Alternative A4; 21.1 miles of Alternative A5; 25.0 miles of Alternative B; and 31.3 miles of Alternative C.

Floodbasin deposits are more suitable for construction than river deposits, but less suitable than continental deposits. Floodbasin deposits are present in 6.1 miles of Alternative A1; 8.9 miles of Alternative A2; 10.6 miles of Alternative A3; 12.6 miles of Alternative A4; 9.3 miles of Alternative 2A5; 3.0 miles of Alternative B; and 3.0 miles of Alternative C.

Mining

No mining activities are located in the proposed Project vicinity.

Faults

Earthquakes occur along fault zones. A fault zone is a break in the continuity of a rock formation caused by a shifting or dislodging of the earth's crust. Figure 4.7-1 shows faults near the study area. The nearest historically active fault is the Concord Fault, about 50 miles west of the study area. Displacement on the Dunnigan Fault, about 20 miles west of the study area, has occurred within Holocene time (within the last 10,000 years). The nearest faults to the ROW have not been active within Quaternary times. This includes the Willows Fault. The Willows Fault parallels the proposed Project ROW within 1 to 5 miles of the study area and crosses the study area at the O'Banion Substation, Segment 1, Segments 2A1 to 2A5, and Segment 3.

Seismicity

A Seismic Zone classification is used by the Uniform Building Code (UBC) to define the magnitude of protection required for a building design to withstand earthquake risk in the area or from adjacent areas. UBC Seismic Zones range from 1 to 4 (with Zone 4 having the highest risk) and are based on a 10-percent probability of specific peak ground acceleration (PGA) values being exceeded within 50 years. The entire study area is located within UBC Zone 3. All of California is seismically active, with numerous historic earthquakes and seismic activity recorded by instruments daily. Seismic Zone 3 could have earthquakes with a Modified Mercalli Intensity (MMI) rating of VIII or higher. The MMI scale rates earthquakes by their effect on people, structures, and objects. Major structural damage would typically occur from an earthquake with an intensity of VIII or higher. Intensity VIII is generally equated with an average peak acceleration of 20 to 30 centimeters per second (cm/sec). This intensity typically results in slight damage to specially designed structures; considerable damage to ordinary substantial buildings, with partial collapse; and great damage to poorly built structures. This intensity also could result in falling columns, monuments, and walls (Bolt 1988). Secondary hazards of earthquakes include rapid ground settlement (subsidence), landslides and rockfalls, and liquefaction. These hazards are discussed below.

Subsidence

Land subsidence occurs when the ground surface decreases in elevation. It can be caused by various natural phenomena such as tectonic movement, consolidation, hydrocompaction, or rapid sedimentation. Subsidence can also result from a variety of human activities, including withdrawing water or petroleum from the subsurface. The numerous fine-grained (clayey) lenses in Central Valley deposits are conducive to subsidence. Subsidence is typically a slow process, unless induced by seismic activity. Its potential effects on structures might not be evident for years or decades.

Landslides and Rockfalls

Landslides, rockfalls, mudslides, and debris avalanches refer to rock or debris descending a slope as a result of gravity. Slopes within the study area are typically shallow or nonexistent, making landslides unlikely. Construction in areas with steep slopes should be avoided whenever possible. These limited areas may include the banks of some rivers, levees, or canals.

Liquefaction

Liquefaction occurs when saturated soils lose strength and cohesion when subjected to dynamic forces, such as shaking during an earthquake. Liquefaction also can occur in unsaturated soils with low cohesion, such as sand. Liquefaction and related phenomena have caused a tremendous amount of damage during historical earthquakes and occurs when water pressure between soil particles increases until the soil cohesion is lost, along with the support that it normally supplies to building foundations. Liquefaction occurs more frequently in areas where groundwater is very shallow, such as in river deposits near water bodies. Quaternary River Deposits (Segment 1, MP 9.5 to 12.8) may be prone to liquefaction.

4.7.2 Environmental Consequences

4.7.2.1 Standards of Significance

Significant geologic impacts would result if:

- Structures fail or create hazards to adjacent property resulting from slope instability, effects of earthquake, or adverse soil conditions (such as compressible, expansive, or corrosive soils).
- Known mineral resource of economic value to the region and the residents of the state are lost or made inaccessible for future use.

4.7.2.2 Environmental Protection Measures

EPMs for geologic resources from Table 3-3 include the following:

68. Geological hazards would be evaluated during final design specification for each structure location and road construction area. Options would include avoidance of a poor site by selection of a site with stable conditions or correction of the unstable slope conditions.
69. A California-registered Professional Geotechnical Engineer would evaluate the potential for geotechnical hazards and unstable slopes on the centerline route and areas of new road construction or widening on slopes with more than a 15-percent gradient.

4.7.2.3 Impacts from Alternatives

The study area crosses three geologic formations at land surface. These formations are, in order of suitability for construction: QTc, Qb, and Qr. QTc is the most geologically stable and most prevalent along the proposed Project ROW. No noteworthy geological features or mineral resources were identified to distinguish among the alternatives. Potential geological impacts would be similar, although the specific locations might vary. The route for Alternatives A1, A2, A3, A4, and 2A5 would cross a fault zone that has not been active within the past 1.6 million years; therefore, this is not considered to have more seismic impact than Alternatives B or C. There would be no difference in geology impacts between the route option east vs. west of SR 99. Mineral resources were not identified in the study area; therefore, no economic value to the region and residents of the state would be lost or inaccessible for future use.

Any steep or unstable slopes near the proposed Project ROW would be avoided or minimized with standard construction practices described above. The proposed Project would cross river deposits and floodbasin deposits that could also succumb to earthquake forces, such as liquefaction, more readily than continental deposits. Geological hazards would be evaluated during final design of each structure location and road construction area and standard design practices would be used. Proposed Project activities would result in less-than-significant impacts to geological resources.

4.7.2.4 Cumulative Impacts

Present and past agricultural uses in the study area have not affected geology. Given Western's design standards and practices, no significant direct or indirect impacts to geology would result from the proposed Project or the No Action Alternative. Foreseeable future projects in the study area include commercial and residential developments that would follow standard design practices to minimize geologic impacts. Therefore, the proposed Project would not contribute to cumulative impacts on geology or mineral resources.

4.7.2.5 Summary of Impacts

No significant direct, indirect, or cumulative impacts to geology would be expected from any of the proposed Project alternatives.

4.8 HEALTH AND SAFETY

4.8.1 Affected Environment

This section describes the health and safety issues associated with the proposed Project.

4.8.1.1 Resource Study Area

The resource study area for health and safety depends on the specific health and safety issue. For example, the study area for hazardous materials and herbicides is the area where they are stored, transported, or applied. Fires, electrocutions, and falls could occur anywhere along the transmission line, making the proposed ROW the study area.

4.8.1.2 Issues of Environmental Concern

Issues of environmental concern for health and safety are spills or mishandling of hazardous materials, hazardous waste, herbicides, electrical contact (fires, burns, and electrocutions), and worker falls. One property owner requested that fencing be installed around new structures so children cannot climb them.

4.8.1.3 Characterization

Hazards can occur under existing conditions, as discussed below:

Hazardous Materials and Hazardous Waste

Hazardous materials concerns could arise from spills (gasoline, diesel fuel, oil, or solvents) from containers or vehicles. Spills could contaminate soils or leach into ground or surface water. Known storage locations include existing substations (O'Banion, Elverta, and Natomas). California-designated hazardous waste has been stored at the Elverta Substation. The waste is managed in accordance with regulations, and is removed for final disposal within allowable time limits. The other substations may store hazardous waste (for example, bushings and oil) for short periods as allowed by regulation.

Western applies herbicides along the existing ROW (Segments 1 and 3), where vegetation threatens the safe operation of the transmission line and related facilities. Herbicide misuse, over-spray, or drift could adversely affect humans, wildlife, vegetation, or water.

Electrical Hazards

Electrical hazards could include vegetation or equipment fires, electrical burns, or electrocutions to humans or animals. Electrical hazards could occur anywhere near energized conductors or facilities (Segments 1, 2, and 3). These hazards are primarily a concern for construction and maintenance workers.

Fall Hazards

Fall hazards could affect individuals working at heights. Elevated work is essential for assembly and repair of transmission structures and equipment (Segments 1, 2, and 3). Workers typically perform this work from bucket trucks or by climbing structures. In both instances, Western requires workers to use fall-protection devices.

4.8.2 Environmental Consequences

The project could affect the environment if hazardous materials were released from spills, as discussed above.

4.8.2.1 Standards of Significance

A significant effect on health and safety would occur under the following conditions:

- Creation of a public or worker health hazard beyond limits set by health and safety regulatory organizations; or
- Interference with adopted emergency response plans.

4.8.2.2 Environmental Protection Measures

EPMs for Health and Safety from Table 3-3 include the following:

70. Conform with safety requirements for maintaining the flow of public traffic and conduct construction operations to offer the least possible obstruction and inconvenience to public transportation.
71. Comply with all applicable health and safety laws, regulations, and standards.
72. Post proper signage in areas within the ROW that would require temporary closure or limited access to accommodate certain land uses.
73. Mark structures and/or shield wire with highly visible devices for identified locations, where required by applicable laws and regulations (for example, the Federal Aviation Administration regulations).

Each of the health and safety issues described above is highly regulated by one or more of the following: U.S. Department of Transportation (DOT), EPA, Occupational Safety and Health Administration (OSHA), and DOE, as well as state, county and local governments. Additionally, Western and its contractors are required to comply with safety and environmental protection policies and guidance developed by Western, including Western's Occupational Safety Program (Western 1998), the *Power System Maintenance Manual* (PSMM), the *Power System Safety Manual* (PSSM) (Western 2002b), and *Power System Operations Manual* (PSOM).

4.8.2.3 Impacts from Alternatives

Construction, rebuilding, and maintenance activities increase the exposure to safety and health hazards.

The risk varies along proposed Project routes, increasing where substances are stored or transferred; live electrical components are likely to contact vegetation, animals, or humans or where workers conduct their tasks at heights. Generally, new construction would be the most intensive in worker time and exposure to these hazards, followed by maintenance. Therefore, the alternatives would be expected to have similar health and safety risks. Performed in compliance with all applicable regulations and guidance, activities for the proposed Project would pose no significant threat to the health and safety of workers or the public or interfere with adopted emergency response plans.

The proposed Project would consist of monopole structures which would require a bucket truck with removable ladders to access. Children would be unable to climb the structures, as there are no climbing features on the monopoles. Western would, therefore, not provide fencing around structures as the impacts to children and the public would be less than significant.

4.8.2.4 Impacts from the No Action Alternative

Under the No Action Alternative, maintenance and line inspection activities would continue on the existing transmission lines. Performed in compliance with all applicable regulations and guidance, these activities would pose no significant threat to the health and safety of workers or the public or interfere with adopted emergency response plans.

4.8.2.5 Cumulative Impacts

Past and present health and safety risks in the proposed Project area are primarily from agricultural operations because the study area passes through extensive farmland. Agriculture ranks high among hazardous industries and farmers are at high risk for fatal and nonfatal injuries, work-related lung diseases, noise-induced hearing loss, skin diseases, and certain cancers associated with chemical use and prolonged sun exposure. Planned developments in the study area would reduce the amount of farmland, thereby reducing health and safety risks associated with agriculture. Increased development in the study area, however, may contribute to the risk of construction-related and automobile accidents. Cumulative impacts from proposed Project construction, operation, and maintenance activities, combined with foreseeable development in the area, would be negligible when performed in compliance with applicable health and safety regulations.

4.8.2.6 Summary of Impacts

Performed in accordance with EPMs and health and safety requirements, the proposed Project would not have significant direct, indirect, or cumulative impacts on health and safety.

4.9 LAND USE

4.9.1 Affected Environment

This section identifies and describes all major land uses that could be affected by the construction and operation of proposed Project alternatives. Western compiled land use information from maps and existing literature from public agencies, including: Sacramento, Sutter, and Placer counties; city of Sacramento; California Department of Conservation; and private organizations. Data sources for the baseline inventory included interpretations from USGS 7.5-minute topographic quadrangle sheets and natural color aerial photographs. Baseline data were supplemented by meetings with Federal, state, and county and city planning and land management agencies.

4.9.1.1 Resource Study Area

The land use study area includes the segment corridors to at least 0.5 mile from centerline. Appendix C presents aerial photographs of the area.

4.9.1.2 Issues of Environmental Concern

Issues of environmental concern include land uses that are susceptible to disturbances resulting from either construction or operation of the proposed Project (such as noise, traffic, dust, etc.). In addition, several issues were identified during scoping. These include reduction of developable acreage; interference and cessation of development; conflicts with existing and proposed land use plans; impacts on farming operations; and removal of prime and unique farmland from production.

4.9.1.3 Characterization

This section describes the existing land uses, land use designations, zoning, and development plans for the study area, which includes Sutter, Sacramento, and Placer counties. The study area also traverses the sphere of influence of the cities of Roseville and

Sacramento.[1] Figure 4.9-1 presents general land use designations for the study area compiled from Sutter, Sacramento, and Placer counties and the city of Roseville. Table 4.9-1 presents general categories of land uses and provides examples of specific land uses within each category. Figure 4.9-2 presents general zoning for the study area compiled from Sutter, Sacramento, and Placer counties. Land use designations are a combination of existing land uses and what future development is planned for a given area, per county or municipal planning. Zoning represents the land use allowed by regulation, and can be changed by following county or municipal procedures. Western and SMUD held meetings with Sacramento, Placer, and Sutter counties and city of Roseville and Sacramento planners to determine locations of specific plans, proposed developments, and habitat conservation areas near the proposed Project. Figure 4.9-3 presents these plan areas and Table 4.9-2 describes the current status for each area. Sacramento, Sutter, and Placer counties had 308,035, 348,349, and 139,597 acres of farmland, respectively, in 1997 with respective production values of $285.6 million, $343.5 million, and $60.5 million in 2000 (California Department of Finance 2002).

The California Department of Conservation (CDC) rates agricultural land according to soil quality and irrigation status and developed the Farmland Mapping and Monitoring Program (FMMP) that produces maps and statistical data used for analyzing impacts on California's agricultural resources. The maps are updated every 2 years with the use of aerial photographs, a computer mapping system, public review, and field reconnaissance. Figure 4.9-4 presents FMMP information in the proposed Project area and Table 4.9-3 defines the land categories (CDC 2006). The CDC administers the Williamson Act, which provides the strongest protection against conversion of agricultural land to urban uses. Landowners within agricultural preserves (those eligible for Williamson Act enrollment) volunteering to keep their land in agricultural or open space uses under a 10-year Williamson Act contract are assessed based on those uses rather than full market or development value during the period of the contract. In 1998, the "Super Williamson Act" became law, providing additional tax incentives to landowners willing to enter into 20-year contracts.

[1] The Sphere of Influence represents the geographic extent to which a city can expand by annexation.

Figure 4.9-5 presents agricultural lands that are enrolled in the Williamson Act.

Table 4.9-4 summarizes information on each segment regarding land use, zoning, amount of prime and unique farmland, governing land use plans, and planned development for each segment. Milepost information is approximate and presented in Figures 3.1-4 through 3.1-12.

4.9.2 Environmental Consequences

4.9.2.1 Standards of Significance

Within the study area, the proposed Project would result in significant impacts if it would:

- Conflict with approved and/or adopted land use plans and goals of the community or area in which they are located, including open space designations or other types of areas designated for preservation;
- Cause physical damage to roads or property, including agricultural, that is not compensated for or repaired to a level equal to or better than what existed prior to damage;
- Preclude present or approved land uses, including prime and unique farmland; and
- Conflict with existing and planned utility ROW.

4.9.2.2 Environmental Protection Measures

EPMs for land use issues from Table 3-3 include the following:

74. When weather and ground conditions permit, all construction-caused deep ruts that are hazardous to farming operations and moving equipment would be restored to preconstruction conditions or compensation would be provided as an alternative if the landowner desires. Such ruts would be leveled, filled and graded, or otherwise eliminated in an approved manner. Ruts, scars, and compacted soils from construction activities in hay meadows, alfalfa fields, pastures, and cultivated productive lands would be loosened and leveled by scarifying, harrowing, discing, or other appropriate method. Damage to ditches, tile drains, terraces, roads and other features of the land would be corrected. The land and facilities would be restored as nearly as practicable to their original conditions.

75. On completion of the work, all work areas except permanent access roads would be returned to pre-construction conditions unless otherwise specified by the land owner/manager.
76. During construction, movement would be limited to the access roads and within a designated area in the ROW to minimize damage to agricultural land.
77. Construction operations would be conducted to prevent unnecessary destruction, scarring or defacing of the natural surroundings to preserve the natural landscape to the extent practicable.
78. No permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey.
79. Damaged fences and gates would be repaired or replaced to restore them to their preconstruction condition.
80. Some land uses occurring within the ROW would require temporary closure or limited access. Proper signage would be posted in these areas.
81. Power lines would span sensitive land uses to the extent possible. Where practical, access roads would be placed to avoid sensitive areas.
82. Where practical, construction activities would be scheduled during periods when agricultural activities would be minimally affected or the landowner would be compensated accordingly.
83. Structure design and placement would be selected to reduce potential conflicts with agricultural practices and the amount of land required for transmission lines.

4.9.2.3 Impacts from Alternatives

Appendix B provides a summary of land disturbances for each alternative. Short-term disturbances would result from construction of material storage yards, access roads, structures, and pulling sites. Long-term disturbances would result from structure foundations and access roads. The alternatives pass primarily through agricultural and industrial lands. Construction and maintenance of the proposed Project would not conflict with existing land use plans and goals because transmission lines are an allowed use on lands designated agricultural and industrial/commercial by the Sacramento, Sutter, and Placer County General Plans.

Segment 1 applies to each action alternative and a portion of it passes through the Feather River Wildlife Area, designated as open space. Segment 1 would be constructed adjacent to an existing transmission line where recreation uses and open space designation could continue within new and existing ROW.

Alternatives A1 and A2 may impact land owned by The Natomas Basin Conservancy (TNBC) along the west side of East Levee Road and Alternatives A3, A4, and A5 may impact TNBC along the east or west side of Highway 99. The mission of TNBC is to promote biological conservation along with economic development and the continuation of agriculture in the Natomas Basin. The NBHCP prepared for the Natomas Basin allows urban development to occur according to local land use plans; therefore, transmission lines would be allowed. Any impacts to conservation lands would be less than significant with implementation of EPMs and consultation described in the biology and wetlands resource sections (Section 4.2 and 4.17).

A residential development is located south of Elkhorn Boulevard in the North Natomas Community Plan area; however, Alternative 2A4, the nearest alternative, would be constructed on the north side of the road in land zoned for agricultural use.

Alternative C would traverse the western boundary of the city of Roseville's sphere of influence. A goal of the city of Roseville's General Plan is to preserve visual quality along the city's western boundary; transmission lines could affect this goal, as further discussed in Section 4.15.2.3.

Construction activities could cause physical damage to local roadways or driveways. The alternatives would traverse driveways of several rural residences and businesses that may be impacted by construction and maintenance activities. Western would work closely with landowners and adhere to EPMs to reduce the magnitude of these impacts. Western would avoid and reduce the magnitude of such impacts by carefully siting staging areas and construction traffic routes; making arrangements with local business owners and residents, and repairing any damage that may occur to roadways or driveways during construction. These impacts would be temporary and would not be significant with implementation of EPMs.

Comments identified during scoping included concerns over the possibility of reducing the amount of developable acreage, interfering and stopping development, and taking farmland out of production. The proposed Project ROW would traverse up to

Table 4.9-1. Land Use Designations

Classification or Land Use Type	Examples of Land Uses
Residential	Single-family residences; multi-family residences such as condominium or apartment, townhouse, or mobile home parks
Civic/Public Facilities	Government offices, airports, police and sheriff stations, fire stations, major medical health care facilities, religious facilities, non-attended public parking facilities, correctional facilities
Commercial	Retail store, shopping center, professional office, business park, retail plant nursery, commercial storage, hotels, and motels
Industrial	Manufacturing facility, motion picture and television studio lots, mineral extraction, oil well, oil refinery, tank farm, substation, gravel pit, concrete plant, landfill, sewer plant, transmission line
Open Space and Recreation	Significant ecological areas, environmentally sensitive habitat, wildlife refuge, river, stream or floodplain, vacant urban land, coastal bluffs, non-recreational area, general rural land, golf course, local or regional park, cemetery, beaches, cultural center, museum, campground, fairgrounds, golf course, playground
Agriculture including prime and unique farmland	Farm field (irrigated or non-irrigated cropland), orchard, wholesale nursery

Source: Southern California Association of Governments (SCAG) 2003

Table 4.9-2 Existing and Proposed Specific Plans, Developments, and Sensitive Areas

Plan/Proposed Development (reference)	Description	Status	Proximity to Study Area
Sutter Pointe Specific Plan (Sutter County May 2007)	The Sutter Pointe Specific Plan would provide for orderly and systematic development of 7,500 acres in the southeastern Sutter County area. It is a mixed-use project that combines industry, commerce, housing, open space, and civic and associated uses. Buildout of the proposed project would be split into five residential/mixed-use development phases and five employment center development phases and is anticipated to occur over about 30 years.	An NOP was issued on March 29, 2007 to prepare a Draft EIR. The comment period closed on April 30, 2007. With the exception of the on- and off-site sewer infrastructure needed to support initial project phases, the project will be analyzed in the EIR at a program level.	Segments 2A1, 2A2, 2A3, 2A4, 2A5, and 2B would pass through this area. A sewer interceptor is proposed to run east along Riego Road. Several schools are proposed at locations greater than 2,000 feet from Segments 2A1 and 2A2.
Metro Air Park (Sacramento County Planning Department August 2006)	Metro Air Park is a 1,892-acre commercial development directly east of Sacramento International Airport.	Metro Air Park planning could start by the end of 2007; however, there are still ongoing negotiations which could affect the future.	About 1 mile west of Segment 2A4. Utility corridors have not been designated.
Greenbriar Specific Plan (Sacramento County Planning Department August 2006)	The Greenbriar Specific Plan would result in the development of 3,473 residential units (671 low-density, 2,215 medium-density, and 587 high-density); approximately 27.5 acres of commercial land uses; an approximate 39-acre lake/detention basin; a 10-acre elementary school; 49 acres of parks and open space; and a 250-foot linear open space/buffer.	The EIR for the Greenbriar Project is being recirculated and revised. The project has not been approved.	Adjacent to southwest corner of Segment 2A4. Utility corridors exist in this area and would not conflict.
North Natomas Community Plan (Sacramento County Planning Department August 2006)	The North Natomas Community Plan area, as amended through 2004, contains a large amount of vacant land (2,813 acres). The designation with the most remaining vacant land is Employment Center with about 890 acres of available land. Approximately 3,512 acres are designated for residential use. There are also 1,414 acres of parks and open space.	The North Natomas Community Plan was approved and a large portion of the area has been developed.	Segment 2A4 follows the northern boundary of this area. Segment 3 lies about 0.5 mile east of this area. No utility corridors were identified that would conflict.
Natomas Joint Vision Plan (Sacramento County Planning Department August 2006)	The Natomas Joint Vision Plan is a collaborative effort between the city of Sacramento and Sacramento County to develop a vision for the 10,000-acre area of Sacramento County between the northern city of Sacramento limits and Sutter County. Concepts for development have been considered and include a mixture of residential densities, an industrial park (in addition to Metro Air Park), and open spaces throughout, most extensively to the north, separating development from the Sutter County boundary. A large amount of open space is anticipated to be dedicated in this area for habitat preservation and farmland retention.	To date, no land use plans have been adopted, and all considerations have been conceptual.	Segments 2A2, 2A3, 2A4, 2A5, and 3 pass through this area. Utility corridors have not been identified.

Table 4.9-2 Existing and Proposed Specific Plans, Developments, and Sensitive Areas

Plan/Proposed Development (reference)	Description	Status	Proximity to Study Area
Panhandle Annexation (Sacramento County Planning Department August 2006 and City of Sacramento Planning August 2006)	The project consists of two portions: the southern portion, an 835-acre area to the south of Del Paso Road, between Del Paso Road and I-80, Northgate Boulevard and Gateway Park Boulevard; and the northern portion, or the 594.7-acre area to the north of Del Paso Road, between Del Paso Road and Elkhorn Boulevard. Upon annexation, the northern portion is proposed to be developed with a Planned Unit Development with a variety of low-, medium-, and high-density residential uses (a total of 3,075 residential units), commercial uses, an elementary school, a middle/high school, and recreation and park spaces. (Sacramento County 2006a)	The environmental document is currently out for public review. The project has not been approved.	Segment 3 passes through this area and Segment 2A4 follows the northern boundary of this area. Utility corridors exist in this area and would not conflict.
The Natomas Basin Conservancy (TNBC May 2007)	TNBC serves as the plan operator for the Natomas Basin Habitat Conservation Plan (NBHCP). TNBC acquires lands for the 22 special-status species that are identified in the NBHCP.	Operating.	Segments 2A2, 2A3, 2A4, and 2A5 pass through portions of this area. Utility corridors have not been identified.
Regional University (Placer County Planning Department GIS 2006)	The 1,100-acre site for this proposed development is located between the West Roseville Specific Plan area and Brewer Road, about 2 miles north of Baseline Road. A formal development proposal was originally submitted to Placer County for a project that includes a 6,000-student university plus a 1,200-student high school on 600 acres, and an adjoining 500-acre mixed-use community with 2,342 dwelling units and 73 acres of commercial uses.	A draft Specific Plan is currently under review by Placer County. Environmental review has not been initiated.	Segment $2C_2$ follows the northern boundary of this area. Utility corridors have not been identified.
Creekview Specific Plan (City of Roseville GIS 2007)	This is a 680-acre specific plan area located west of the City of Roseville, but within its sphere of influence, generally northwest of the West Roseville Specific Plan.	Roseville city staff and the landowner team are in the preliminary process of developing a land use plan for this project. Environmental review has not been initiated.	This area is located about 0.25 mile east of Segment $2C_2$. Utility corridors have not been identified.
West Roseville Specific Plan (City of Roseville GIS 2007)	The West Roseville Specific Plan area includes approximately 3,100 acres. Planned land uses include approximately 8,430 dwelling units and 2.2 million square feet of non-residential uses. An open space preserve is planned for this area along the western boundary. (Roseville 2004a)	The West Roseville Specific Plan has been approved. Phase I buildout is in progress.	Segment $2C_2$ is adjacent to the western boundary of this area. Utility corridors have not been identified.
Curry Creek Community Plan (City of Roseville GIS 2007)	The Placer County Board of Supervisors has discussed preparation of a "Curry Creek Community Plan" that would generally encompass the regional university site and the area between that site and the Placer Vineyards Specific Plan area.	A decision has not been made whether to proceed with this project.	Segment $2C_2$ envelopes this area. Utility corridors have not been identified.

Table 4.9-2 Existing and Proposed Specific Plans, Developments, and Sensitive Areas

Plan/Proposed Development (reference)	Description	Status	Proximity to Study Area
Placer Vineyards Specific Plan (City of Roseville GIS 2007)	The Placer Vineyards Specific Plan project is a mixed-use master planned community with residential, employment, commercial, open space, recreational and public/quasi-public land uses. The plan provides for 14,132 homes in a range of housing types, styles, and densities.	The final EIR is being prepared. The project has not been approved.	Segments 2B and $2C_1$ pass through this area. No utility corridors were identified that would conflict.
Sierra Vista Specific Plan (City of Roseville GIS 2007)	Most of the SVSP area is within the city of Roseville's sphere of influence and encompasses about 2,172 acres. The plan area could ultimately include 10,300 residential dwelling units, commercial, open space, parks, and five schools.	Roseville city staff and the landowner team are in the preliminary process of developing a land use plan for this project. The Roseville City Council agreed to process an application to annex the area in April 2007.	Segment $2C_2$ passes through the western portion of this planning area. Utility corridors have not been identified.
Brookfield Development (City of Sacramento 2006)	Mixed use future study area bounded by the Sutter County Line to the north, Elverta Road to the south, East Levee Road to the east, and Highway 99 to the west.	No development application submitted as of the date of this document. Numerous landowners and attorneys on their behalf submitted comments during scoping.	Segments 2A1, 2A2, 2A3, 2A4, and 2A5 would pass through portions of this potential development area. Utility corridors have not been identified.
Cross Canal	Cross Canal supplies irrigation water to agricultural fields, and is a tributary to the Sacramento River.	NOAA Fisheries designated Cross Canal as Critical Habitat for Central Valley steelhead.	Segments 2A1, 2A2, 2A3, 2A4, 2A5, 2B, and $2C_1$ cross this canal.
Natomas East Main Drainage Canal	Natomas East Main Drainage Canal extends south from Pleasant Grove Creek Canal, merges with Arcade Creek, and flows to the Sacramento River.	NOAA Fisheries designated Cross Canal as Critical Habitat for Central Valley steelhead.	Segment 3 crosses this canal.
Gilsizer Slough	This area was designated as a Significant Area by the California Department of Fish and Game because it is a rare natural community that is of highly limited distribution.	Gilsizer Slough is identified as a rare natural Valley Freshwater Marsh in CNDDB.	Segment 1 crosses through this area.
Feather River Wildlife Area	This is a state-owned wildlife area designated as open space to protect and enhance habitat for wildlife species and to provide the public with a wildlife-related recreational area.	Operating.	Segment 1 crosses through this area.

Source: City of Roseville Planning and Redevelopment Department GIS data December 2006
City of Sacramento Planning Department GIS August 2006
Sacramento County Planning Department GIS August 2006
Sutter County Community Services GIS May 2007
The Natomas Basin Conservancy January 2007

Table 4.9-3 California Department of Conservation Farmland Categories

Farmland Category	Examples of Land Uses
Urban and Built-Up Lands	Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or about 6 structures to a 10-acre parcel. This land is used for residential; industrial; commercial; construction; institutional; public administration; railroad and other transportation yards; cemeteries; airports; golf courses; sanitary landfills; sewage treatment; water control structures; and other developed purposes.
Grazing Land	Land on which the existing vegetation is suited to the grazing of livestock. This category was developed in cooperation with the California Cattlemen's Association, University of California Cooperative Extension, and other groups interested in the extent of grazing activities.
Farmland of Local Importance	Land of importance to the local agricultural economy as determined by each county's board of supervisors and a local advisory committee.
Prime Farmland	Farmland with the best combination of physical and chemical features able to sustain long-term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the 4 years prior to the mapping date.
Farmland of Statewide Importance	Farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
Unique Farmland	Farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated, but may include nonirrigated orchards or vineyards, as found in some climatic zones in California. Land must have produced crops at some time during the 4 years prior to the mapping date.
Water	Perennial water bodies with an extent of at least 40 acres.
Other Land	Land not included in any other mapping category. Common examples include low-density rural developments; brush, timber, wetland, and riparian areas not suitable for livestock grazing; confined livestock, poultry, or aquaculture facilities; strip mines and borrow pits; and water bodies smaller than 40 acres. Vacant and nonagricultural land surrounded on all sides by urban development and greater than 40 acres is mapped as Other Land.

Source: California Division of Land Resource Protection 2007

Table 4.9-4 Segment Information Including Land Use, Zoning, Farmland, and Land Use Plans

Segment	Land Use		Zoning		Prime Unique Farmland (Acres)	Other Information	Governing Land Use Plans and Planned Developments
	MP	Land Use	MP	Zoning			
1	0–11.0	Agricultural	0–1.5	Agricultural	9.4	• Parallels existing transmission line ROW • Parallels Sutter Bypass MP 0-9.0 • Crosses Feather River at MP 11	• Sutter County General Plan
	11.0–11.5	Open Space	1.5–2.0	Recreation			
	11.5–end	Agricultural	2.0–end	Agricultural			
2A1	0–2.3	Agricultural	0–11.0	Agricultural	3.9	• Parallels Highway 99 to Riego Rd • Parallels existing distribution lines along Riego Road • Four residences between Elverta Road and the end • Commercial fisheries enterprise south of MP 9.2 • TNBC to east from MP 9.3–10.0	• Sutter County General Plan • Sacramento County General Plan • Sutter Pointe Specific Plan • Natomas Joint Vision Area
	2.3–5.4	East: industrial West: agriculture					
	5.4–9.3	Industrial	11.0–end	West: agricultural East: recreation			
	9.3–end	West: agricultural East: agricultural, agricultural-residential, intensive industrial					
2A2	0–2.3	Agricultural	0–11.0	Agricultural	3.9	• Parallels Highway 99 to Sacramento-Sutter County Line • Four residences between Elverta Road and the end • Commercial fisheries enterprise south of MP 9.3 • TNBC to south between MP 6.8 and 9.3 and to west between MP 9.30 and 10.0	• Sutter County General Plan • Sacramento County General Plan • Sutter Pointe Specific Plan • Natomas Joint Vision Area
	2.3–5.4	East: industrial West: agriculture					
	5.4–6.8	Industrial					
	6.8–9.3	North: industrial South: agricultural	11.0–end	West: agricultural East: recreation			
	9.3–end	Same as 2A1					

Table 4.9-4 Segment Information Including Land Use, Zoning, Farmland, and Land Use Plans

Segment	Land Use		Zoning		Prime Unique Farmland (Acres)	Other Information	Governing Land Use Plans and Planned Developments
	MP	Land Use	MP	Zoning			
2A3	0–2.3	Agricultural	0–end	Agricultural	6.8	• Parallels Highway 99 to Elverta Road • Parallels SMUD 69-kV distribution line along Elverta Road • One residence along Elverta Road, one south of Elverta Road at MP 10.8, and four residences between Elverta Road and the end • TNBC to west between MP 6.8 and 8.3 and to east between MP 6.8 and 7.2	• Sutter County General Plan • Sacramento County General Plan • Sutter Pointe Specific Plan • Natomas Joint Vision Area
	2.3–5.4	East: industrial West: agriculture					
	5.4–6.8	Industrial					
	6.8–end	Agricultural					
2A4	0–2.3	Agricultural	0–10.4	Agricultural	8.0	• Parallels Highway 99 to Elkhorn Boulevard • Elementary School located south of MP 12.5 within 0.5 mile • Four residences along north side of Elkhorn Boulevard • Large residential development south of Elkhorn Boulevard • TNBC to west between MP 6.8 and 8.3 and to east between MP 6.8 and 7.2	• Sutter County General Plan • Sacramento County General Plan • Sutter Pointe Specific Plan • Natomas Joint Vision Area • North Natomas Community Plan • Greenbriar Specific Plan
	2.3–5.4	East: industrial West: agriculture	10.4–13.0	North: agricultural South: open space, residential, and commercial			
	5.4–6.8	Industrial					
	6.8–10.4	Agricultural					
	10.4–13.0	North: agricultural South: residential, open space, industrial, and commercial					
	13.0–end	Agricultural	13.0–end	Agricultural			
2A5	0–2.3	Agricultural	0–11.2	Agricultural	5.0	• Parallels Highway 99 to proposed community separator • Four residences south of Elverta Road near MP 11.0 • TNBC to west between MP 6.8 and 7.8 and to east between MP 6.8 and 7.2	• Sutter County General Plan • Sacramento County General Plan • Sutter Pointe Specific Plan • Natomas Joint Vision Area
	2.3–5.4	East: industrial West: agriculture					
	5.4–6.8	Industrial	11.2-end	East: recreation West: agricultural			
	6.8–10.7	Agricultural					
	10.7–end	West: agricultural East: agricultural, agricultural-residential, intensive industrial					

Table 4.9-4 Segment Information Including Land Use, Zoning, Farmland, and Land Use Plans

Segment	Land Use		Zoning		Prime Unique Farmland (Acres)	Other Information	Governing Land Use Plans and Planned Developments
	MP	Land Use	MP	Zoning			
2B	0–2.5	Agricultural	0–6.2	Agricultural	0.8	• Parallels a railroad ROW from MP 0.3–7.6 • Several homes to the east and one home to the west from MP 0.4–0.6 • One home east and one home west of Fifield Road intersection • Homes along Sankey Road and Natomas Road and rural residences east and west of the alignment from MP 5.2 to 8.0	• Sutter County General Plan • Sacramento County General Plan • Placer County General Plan • Sutter Pointe Specific Plan • Placer Vineyards
	2.5–4	West: industrial, East: agricultural	3.8	Industrial to west			
	4–6.2	Industrial & agricultural	6.2–8.8	Residential & agricultural			
	6.2–7.9	Low-density residential					
	7.9–end	West: agricultural, East: agricultural-residential, intensive industrial, and agricultural	8.8–end	Open space, industrial			
1	0–6.7	Agricultural	0–6.7	Agricultural	1.8	• Parallels an existing transmission line with several crossovers • Scattered residences between MP 0 and 3.0	• Sutter County General Plan • Sacramento County General Plan • Placer County General Plan • Placer Vineyards
	6.7–7.9	Low-density residential	6.7–7.9	Residential & agricultural			
	7.9–end	Residential, agricultural, industrial, and open space	7.9–end	Agricultural			
2C2	0–3.9	Agricultural	0–3.9	Agricultural	3.4	• Scattered residences along route	• Placer County General Plan • Regional University • Curry Creek Community Plan • West Roseville Specific Plan • Sierra Vista Specific Plan
	3.9–5.0	East: open space West: agricultural	3.9–5.0	East: open space West: agricultural			
	5.0–end	Agricultural	5.0–end	Agricultural			

Table 4.9-4 Segment Information Including Land Use, Zoning, Farmland, and Land Use Plans

Segment	Land Use		Zoning		Prime Unique Farmland (Acres)	Other Information	Governing Land Use Plans and Planned Developments
	MP	Land Use	MP	Zoning			
3	0–1.0	Industrial	0–2.3	West: agricultural East: industrial & open space	0.3	• Rebuild of an existing transmission line	• Sacramento County General Plan • Natomas Joint Vision Area • Panhandle Area
	1.0–2.3	West: agricultural East: industrial & agricultural	2.3–3.3	West: agricultural East: industrial & open space			
	2.3–4.3	West: residential & commercial East: industrial & residential	3.3–4.3	West: agricultural East: agricultural & residential			
	4.3–end	Industrial	4.3–end	Industrial			

Burleson 2007

18.9 miles of prime and unique farmland (286.4 acres) and up to 98.5 acres enrolled in the Williamson Act. The alternatives would disturb between 33.4 and 63.6 acres of prime and unique farmland during construction and permanently remove between 18.3 and 34.7 acres from agricultural production where new structures and access roads would be placed in the ROW. The proposed Project would impact less than 0.04 percent of the approximately 796,000 acres of farmland in Placer, Sacramento, and Sutter counties and would not be expected to have a significant impact on revenues from farming operations in each county. Removing prime and unique farmland permanently from agricultural use may affect farming operations but would not preclude their agricultural use. Western would comply with any applicable mitigation requirements pertaining to the loss of prime and unique farmland and Williamson Act Lands, as applicable.

The presence of transmission lines could impact farming operations that use crop dusters. Crop dusters would need to make additional passes around transmission lines and structures to achieve the same coverage as fields without structures and transmission lines. Transmission lines and structures can also create potential safety hazards because they present additional obstacles to avoid that require additional pilot attention and can create pilot stress. To minimize these impacts, surface application techniques could be used near transmission lines and structures. Additionally, farming impacts on the ground would include additional passes for tilling, planting, and harvesting to maneuver around structures. Effects on grazing, pasture, set-aside, and other nontilled uses would be minimal. In areas where the alternatives parallel existing transmission lines, the addition of new transmission lines would not add to these impacts that already exist. Constructing and maintaining the proposed transmission lines would not preclude farming and are not expected to be a significant impact on farming practices because of the relatively small acreage involved.

The alternatives would remove between 78.0 and 224.2 acres of proposed development acreage (see Table B-1 in Appendix B); however, present zoning and land use are not designated for residential development and this amount would not be expected to preclude future development potential. Western did not identify any conflicting utility ROW in the planned development areas presented in Figure 4.9-3 and Table 4.9-2; therefore, conflicts with planned utilities are not anticipated. Alternative A1 would parallel existing distribution lines on Riego Road and a sewer interceptor is planned along Riego Road; however, adequate ROW is expected to be available for new transmission lines. Alternative A3 would parallel existing SMUD distribution lines on Elverta Road but adequate ROW is available for new transmission lines.

4.9.2.4 Impacts from the No Action Alternative

Routine maintenance activities would be conducted under the No Action alternative that would not be expected to conflict with existing land uses; cause damage to roads or property; preclude present or approved land uses, including those for prime and unique farmland; or conflict with existing and planned utility ROW. Western would continue to work with landowners regarding scheduling of routine maintenance and operation activities.

4.9.2.5 Cumulative Impacts

Past and present land uses in the proposed Project area are primarily agricultural. Cumulative impacts have occurred from the encroachment of urban development on farmland, which continues to convert prime and unique farmland. According to the California Division of Land Resource Protection, between 2000 and 2002:

- Placer County gained 5,408 urban acres, more than 90 percent of which had been farm or grazing land. This was a 40-percent increase in the urbanization rate compared to the 1998-2000 figures.
- In Sacramento County, fewer acres were converted to urban land (2,741) than in the 1998-2000 cycle (6,430). Farm and grazing acres decreased by 4,551 in the 2000-2002 cycle resulting from urbanization and improved mapping of rural residential areas, a decrease from the 5,729-acre drop in 1998-2000.
- Urbanization was also slightly down in Sutter County, where 488 acres were urbanized between 2000 and 2002, compared with 692 acres in the 1998 to 2000 cycle.

Agricultural land in Sacramento and surrounding counties will continue to face development pressure in the foreseeable future. The California Department of Finance projects that the area's population will

increase from about 1.9 million in 2000 to 2.8 million by 2020 (California Department of Finance 2006).

Foreseeable, future projects in the study area include residential and commercial developments that would result in a substantial conversion of agricultural land to urban uses (see Table 4.9-3). Sacramento County is in the early stages of implementing its farmland mitigation policy, which would mitigate loss of prime farmlands or lands with intensive agricultural investments through CEQA requirements to require in-kind protection of nearby farmland. This policy would be expected to compensate for future farmland conversion within Sacramento County.

The construction and maintenance of the proposed transmission lines in Sacramento, Placer, and Sutter counties would be a very small contributor to the conversion of land from agricultural use compared to ongoing conversion caused by urban encroachment.

4.9.2.6 Summary of Impacts

While minor differences exist among alternatives to land use impacts, none of the alternatives would result in a significant direct, indirect, or cumulative impact. The alternatives would not conflict with any approved or adopted land use plans, preclude any present or approved land uses, have uncompensated or unrepaired damage to roads or property, or conflict with existing or planned utility ROWs. Development pressures would contribute to the conversion of prime and unique farmland. Planning processes, however, would require that projects are managed and compensated through various state and local programs. Efforts and mitigation measures implemented by these, collectively, would reduce cumulative impacts to less than significant.

4.10 NOISE

4.10.1 Affected Environment

This section describes existing conditions and noise impacts that would result from the proposed Project. Noise is sound that is often considered undesirable because it can interfere with speech, communication, hearing, or is otherwise annoying. It can be intense enough to damage hearing. Noise decreases with distance from the source. The distance at which sound can be heard depends on factors such as: the intensity of the sound, meteorological conditions, terrain, and background noise levels.

4.10.1.1 Resource Study Area

The study area for proposed Project alternatives would include about 38 miles of linear project features within the counties of Sutter, Sacramento, and Placer. The study area for noise impacts covers the ROW and nearby areas that could be impacted by noise from the ROW.

4.10.1.2 Issues of Environmental Concern

Potential noise impacts for the proposed Project would be from construction and operation of the line.

4.10.1.3 Characterization

Sound levels are stated in decibels (dB), a measure of sound pressure compared to a reference sound pressure. Sound levels calculated as decibel, A-weighted sound levels (dBA), approximate the frequency response of the human ear. Table 4.10-1 shows the approximate sound levels for typical noise sources.

The study area passes through or near urban areas; mixed agricultural, commercial, industrial, and residential developments; and highways. OSHA and the California Noise Control Act (California Health and Safety Code Sections 46000 to 46080) apply to the generation of, and exposure to, noise. Counties and local governments set noise regulations to protect communities against nuisance noises and noise from incompatible land uses.

The average day-to-night noise level (L_{dn}) is used as a standard of regulation and is calculated by adding a 10-dB penalty to sound levels in the night (10 p.m. to 7 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours. Noise sources exceeding a day-to-night standard of 65 dBA (L_{dn}) at residences are generally considered to be incompatible with residential land uses. EPA has published an outdoor noise level guideline of 55 dBA averaged over 24 hours (EPA 1974).

The **Sutter County General Plan** includes policies (Policy 8.A-2, 1996) to reduce noise from new non-transportation sources to below the standards of 50 dB on an hourly basis during daytime hours (7 a.m. to 10 p.m.) and 45 dB during nighttime hours (10 p.m. to 7 a.m.).

The **Sacramento County Code** (Chapter 6.68.070) specifies exterior noise standards for residential zones of 55 dBA between 7 a.m. and 10 p.m. and 50 dBA between 10 p.m. and 7 a.m. Noise sources associated

Table 4.10-1 Sound Levels for Some Typical Outdoor Noise Sources

Noise Level (decibels)	Outdoor Noise
110	Jet flyover at 1,000 feet
100	Gas lawn mower at 3 feet
90	Diesel truck at 50 feet
80	Urban daytime noise
70	Gas lawn mower at 100 feet
60	Heavy traffic at 300 feet
50	Quiet urban daytime
40	Quiet urban night time
30	Quiet rural night time
20	Rustling leaves
10	Mosquito at 3 feet

Source: Western 2002a

with construction, however, are exempt from these standards as long as the construction does not take place between 8 p.m. and 6 a.m. weekdays or between 8 p.m. and 7 a.m. weekends (Chapter 6.68.090).

The **Placer County Code** (Chapter 9.36.060) specifies exterior noise standards for residential zones of 55 dBA between 7 a.m. and 10 p.m. and 45 dBA between 10 p.m. and 7 a.m. Construction noise sources are exempt between the hours of 6 a.m. and 8 p.m. Monday through Friday, and between the hours of 8 a.m. and 8 p.m. Saturday and Sunday, as long as all construction equipment is fitted with factory installed muffling devices and that all construction equipment is maintained in good working order (Chapter 9.36.030).

The **Roseville Municipal Code** (Section 9.24.100) specifies exterior noise standards for residential zones of 50 dBA between 7 a.m. and 10 p.m. and 45 dBA between 10 p.m. and 7 a.m. The City of Roseville exempts construction activities from these noise level standards between the hours of 7 a.m. and 7 p.m. on Monday through Friday and 8 a.m. to 8 p.m. on Saturday and Sunday, as long as all construction equipment is fitted with factory-installed muffling devices and all construction equipment is maintained in good working order (Section 9.24.030).

The study area would traverse areas ranging from sparsely inhabited rural and agricultural to metropolitan. Activities within the study area that generate noise above background levels of 30 to 50 dBA would include motor vehicle traffic along the interstates and state routes. Freeway traffic levels can be up to 90 dBA and local traffic noise can be up to 80 dBA. Industrial activities and construction in the region, railroad traffic, agricultural activities, and aircraft traffic at airstrips and at Sacramento International Airport also contribute to noise levels near the study area. SRs 99, 113 and 70 are the major sources of traffic noise.

4.10.2 Environmental Consequences

4.10.2.1 Standards of Significance

A significant effect from noise would occur under the following condition:

- Exceedance of local, state or Federal noise regulations or guidelines at sensitive receptors such as residences, hospitals, or schools.

4.10.2.2 Environmental Protection Measures

EPMs for noise resources from Table 3-3 include the following:

84. All vehicles and equipment would be equipped with required exhaust noise abatement suppression devices.

85. Construction and maintenance activities would be consistent with local noise ordinances.

4.10.2.3 Impacts from Alternatives

Each alternative would involve construction of new transmission line and new structures. Therefore, noise impacts from each alternative would be similar. Construction would require the use of several kinds of construction equipment. Sound levels from typical construction equipment are shown in Table 4.10-2.

New transmission line construction consists of six phases: ROW preparation and access road construction, excavation, concrete pouring of foundations, steel assembly and structure erection, wire stringing, and cleanup. Table 4.10-3 shows sound levels from various kinds of construction activities.

New transmission line construction, removal of transmission structures, access road construction, and pulling operations all generate noise. Estimated maximum noise levels during peak construction at the edge of ROW for the project would not exceed 93 dBA. Noise generated during wire stringing and at the pulling sites would be about 90 dBA. Commercial businesses and residences would be close enough to the proposed Project alternatives that noise from construction would be noticeable.

Because the construction would be of short duration, with intermittent noise only during daylight hours, the limits for day-to-night average noise (65 dBA L_{dn}) and 24-hour average noise (55 dBA Leq[24]) would not likely be exceeded at any noise sensitive receptors for an extended duration. Noise from construction activity typically is exempt from local standards because of its limited duration. Construction work would not exceed 2 to 3 days at most locations. In addition, feasible noise abatement measures would be implemented through the EPM described above. Therefore, construction noise impacts would be considered to be less than significant.

Corona discharges at the conductor surface resulting from the electrical breakdown of air into charged particles cause operational noises of transmission lines. Noise would mainly occur during wet weather, with noise levels low enough to blend into the background and not be noticeable beyond the edge of the ROW.

Table 4.10-2 Sound Levels from Typical Construction Equipment

Equipment	Average Sound	Distance (feet)
Dump Trucks	91	50
Heavy Trucks	91	50
Welding Machine	73	50
Backhoe (0.75 cubic yards)	85	50
Loader	78	50
Grader	87	50
Concrete Mixer	85	50
Movable Crane	88	50
Generator	78	50
Pneumatic Tools	85	30
Compressor	86	50
Trencher	72	25
Side Boom	80	25
Cat Tractor	93	25
Jackhammer	88	50
Hand Grinder	82	5

Source: United States Environmental Protection Agency 1971

Table 4.10-3. Sound Levels from Typical Construction Activities

Activity	Loudest Construction Equipment	Equipment Noise Level (dBA)	Composite Site Noise Level at 50 feet from Source (dBA)
Right-of-way, access roads, gates and clearing	Grader Dozer Backhoe	87 85 85	90.5
Excavation	Heavy truck Compressor Backhoe	91 86 85	93.0
Foundations	Heavy truck Compressor Concrete mixer	91 86 85	93.0
Steel assembly and structure erection	Moveable crane Tractor Side boom	88 87 74	90.6
Wire stringing	Heavy truck Movable crane Dozer	91 88 85	93.4
Cleanup	Heavy truck Grader Dozer	91 87 85	93.2

Source: United States Environmental Protection Agency 1971
dBA = Decibel, A-weighted sound levels

Maintenance of the transmission line would result in the noise of routine inspection vehicles or aircraft periodically during the year. If repairs are required, noise would result from vehicles, equipment, and tools.

4.10.2.4 Impacts from the No Action Alternative

Under the No Action Alternative, maintenance and line inspection activities would continue on the existing lines. Periodic noise sources would be from inspection aircraft and vehicles with the associated noise of equipment and tools and would be short-term and less-than-significant.

4.10.2.5 Cumulative Impacts

Past and present land uses in the proposed Project area are primarily agricultural. Ambient noise in agricultural areas commonly includes wind and rustling vegetation, intermittent farm equipment operation, and minor traffic.

Construction activities of proposed Project alternatives would increase noise levels. These effects would be sporadic and temporary and result in less-than-significant direct impacts. The characteristics of noise dictate that noise is reduced with distance. It is unlikely that most receptors would experience an increase in noise levels above current conditions. Periodic increases in noise levels from maintenance would not result in significant direct impacts.

Foreseeable growth and development in the study area would result in increased noise levels from construction, traffic and more residents. Increased population and vehicle traffic may lead to a low cumulative effect of increased background levels that would likely fall below local noise regulations and be less than significant. Intermittent noise impacts may occur during residential and commercial construction. The proposed Project construction would contribute to this short-term cumulative impact; however, this cumulative impact would be less than significant.

4.10.2.6 Summary of Impacts

No significant direct, indirect, or cumulative noise impacts would result from proposed Project alternatives.

4.11 PALEONTOLOGICAL RESOURCES

4.11.1 Affected Environment

This section describes paleontological resources that occur within the proposed Project area and the potential impacts the proposed Project may have on them. Paleontological resources are fossilized remains or imprints of multicellular animals and plants (36 CFR Part 261.2). A fossil is the remnant or trace of an organism of a past geologic age, such as a skeleton or leaf imprint, embedded and preserved in the earth's crust. The significance of paleontological resources is subjectively ranked based on the presumed scientific value of proven fossil content. Vertebrate fossils are typically less abundant than invertebrate fossils and are usually rated more significant. However, well-preserved soft-bodied organisms, including worms, insects, spiders, or rare invertebrate fossils, may be considered highly significant.

The Society of Vertebrate Paleontology (SVP) has established standard guidelines that outline acceptable professional practices in the conduct of paleontological resource assessments and surveys; monitoring and mitigation; data and fossil recovery; sampling procedures; and specimen preparation, identification, analysis, and curation. Most California state regulatory agencies accept the SVP standard guidelines as a measure of professional practice and most practicing professional paleontologists in the nation adhere closely to SVP's requirements.

4.11.1.1 Resource Study Area

The study area for paleontological resources is the width of 1 mile from the ROW centerline. The excavation depth for footings would be dependent on soil characteristics at each structure location; however, a depth of 30 feet has been assumed for similar projects.

4.11.1.2 Issues of Environmental Concern

The issue of environmental concern for paleontological resources is the potential destruction of significant fossils in the study area. Potential impacts to paleontological resources would be confined to construction activities. Construction of a new transmission line would necessitate excavation of potentially undisturbed ground and require extensive use of heavy equipment for new structures. Excavation for structures covers largely disturbed agricultural regions north of the Sacramento metropolitan area.

4.11.1.3 Characterization

The proposed Project is in the central portion of California's Central Valley. A review of collection records maintained by the University of California's Museum of Paleontology in December 2006 revealed 15 vertebrate fossil localities within the geologic formation underlying the segments. Because of confidentiality concerns, the exact location of these localities is unavailable.

Paleontological resources are defined by the geologic units in which they are found. Fossils are found in sedimentary rocks. Sedimentary rocks are typically classified into lithostratigraphic units—units of stratified, mainly sedimentary, rocks that are grouped based on lithology, rather than biologic characteristics or age.

As discussed in Section 4.7 (Geology), three types of geologic formations exist along the transmission corridor between the O'Banion and Natomas substations (see Figure 4.7-1), including:

- ***Quaternary Floodbasin (Qb)***—Floodbasin deposits, associated with flood stage on major streams;
- ***Quaternary River Deposit (Qr)***—River deposits, associated with river channels, floodplains, and natural levees; and
- ***Quaternary Continental Deposit (QTc)***—Continental deposits (older alluvium, fanglomerates, and sedimentary formations).

The river and floodbasin deposits are Holocene (since the last ice age within the last 11,000 years), and the continental deposits are Pliocene to Holocene. The Pliocene (5.4 to 2.4 million years ago) represents the final stages of a global cooling trend that led up to the ice ages.

In general, the fossil potential for the river deposits is low because this is primarily an erosive environment, whereas the fossil potential for the floodbasin and continental deposits is high, because they are depositional environments. An example of the fossil potential of these units is excavation of

bones from a giant ground sloth, bison, camel, and mammoth tusks at the Arco Arena in 1989 (Butler 2001; Hilton 2002). Arco Arena is about 2 miles west of the Natomas Substation, outside of the study area. These fossils were found at a depth of 12 to 15 feet and date between 600,000 and 15,000 years old in continental deposits. This was a large excavation with a much greater likelihood of encountering fossils, when compared to excavations necessary for structure footings.

Lithostratigraphic units within the study area range in age from Holocene to Pliocene. The continental and floodbasin deposits have the potential to contain significant fossils. Much of the existing and proposed routes and alternatives cover large areas of row crops and rice fields. Because of intense cultivation, these areas would generally have a low paleontologic expectation for near-surface soils.

4.11.2 Environmental Consequences

4.11.2.1 Standards of Significance

The effects of the proposed Project would be considered significant if activities would result in:

- Loss of, or inaccessibility to, scientifically important paleontological resources.

4.11.2.2 Environmental Protection Measures

EPMs for paleontological resources issues from Table 3-3 include the following:

57. Before construction, all supervisory construction personnel would be instructed on the protection of cultural, paleontological, and ecological resources. To assist in this effort, the construction contract would address applicable Federal, state, and Tribal laws regarding antiquities, fossils, plants, and wildlife, including collection and removal, and the importance of these resources and the purpose and necessity of protecting them. Western would instruct that cultural resources might be present in the study area. Contract employees would be trained to stop work near any discovery and notify Western's regional environmental manager, who would confirm that the resource is evaluated and avoided. Known cultural resources would be fenced and a minimum distance maintained for work disturbances.

86. Preconstruction surveys of sensitive paleontological areas may be conducted, as agreed upon by the appropriate land-managing agencies and Western.

4.11.2.3 Impacts from Alternatives

Potential paleontological impacts are essentially proportional to the number of new structures required by a given alternative and the types of deposits on which they would be built. As discussed in Section 4.11.1.3, paleontological resources are unlikely to be present in river deposits (Q_r) and likely to be present in floodbasin (Q_b) or continental deposits (QT_c). Access roads should have negligible impact on paleontological resources because they are not generally associated with excavation. Table 4.11-1 presents the estimated miles and proposed number of new structures that would be constructed on floodbasin, continental, and river deposits.

Table 4.11-1 Paleontological Deposits of Concern

Description	Alternatives (in miles)							
	A1	A2	A3	A4	A5	B	C	No Action
Miles of study area traversing continental and floodbasin deposits (where paleontological resources likely would be found)	30.3	30.2	30.5	31.9	30.4	28.0	34.3	0
Miles of study area traversing river deposits (where paleontological resources would likely not be found)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	0
Number of new structures likely to be built in continental and floodbasin deposits	147	147	148	155	148	136	166	0

Source: Burleson 2006

The proposed Project potential impacts would be in localized areas (primarily excavations for new structure footings). Following selection of a Preferred Alternative, Western will determine the proximity to known paleontological resources and site structures to avoid them. Excavation for structures covers largely disturbed agricultural regions; however, installing structures to a depth of 30 feet may uncover fossils. Monitoring excavation if fossils are encountered would reduce any significant effect on paleontological resources for the scientific and educational value of a significant paleontological site.

4.11.2.4 Impacts from the No Action Alternative

Under the No Action Alternative, the existing double-circuit 230-kV transmission system between O'Banion and Natomas Substations would continue to operate and be maintained as it is presently. The line would be periodically accessed for routine maintenance or emergency repairs along the existing ROW and access roads. These activities are also consistent with the alternatives. This action would have no impact on paleontological resources.

4.11.2.5 Cumulative Impacts

Past and present land uses in the study area have been primarily agricultural, with extensive shallow land disturbance that could impact paleontological resources. Residential and commercial development is proposed to extend into the study area that could cumulatively contribute to disturbances of fossil-bearing sedimentary deposits and threaten paleontological resources. Developments would follow standard design practices to minimize paleontological impacts.

Given Western's design standards and practices, no significant direct or indirect impacts to paleontological resources would result from the proposed Project. Proper site monitoring by supervisory construction personnel that have been instructed on the protection of paleontological resources would minimize the potential for loss of paleontological resources during project activities. Therefore, no significant cumulative impacts would occur to paleontological resources.

4.11.2.6 Summary of Impacts

Essentially, no variation to paleontological impacts exists between alternatives. No significant direct, indirect, or cumulative impacts would be expected from the proposed Project.

4.12 SOCIOECONOMICS

This section describes the existing conditions and socioeconomic impacts resulting from the proposed Project alternatives. The socioeconomic setting for this section includes data on housing, employment, and income. Demographic data are provided from the 2000 U.S. Census and the California Department of Finance.

4.12.1 Affected Environment

4.12.1.1 Resource Study Area

The study area for the proposed Project includes the counties of Sacramento, Sutter, and Placer and the city of Sacramento. A large portion of the proposed Project would cross private property or run along existing easements owned by Western. However, the socioeconomic scope of the proposed Project goes beyond the ROW, with the study area including both the county and city level.

4.12.1.2 Issues of Environmental Concern

Issues of environmental concern within the study area include displacement of existing residents, disruption of existing businesses, reduction of property values, effects on income and employment, and if the proposed Project induces new growth, long-term population increases and the resultant demand for goods. The environmental impacts of these issues could occur temporarily during the construction period and long term during operation. The types of potential impacts listed above could have a positive or negative effect on the socioeconomic conditions of the study area. Potential socioeconomic benefits include those associated with a long-term increase in the reliability of the power supplies transmitted over transmission lines and a temporary increase in employment and income during construction.

4.12.1.3 Characterization

Housing Characteristics

Table 4.12-1 presents housing unit and vacancy rate data from the 2000 U.S. Census for Sacramento, Sutter, and Placer counties and the city of Sacramento.

Employment Characteristics. To examine labor force characteristics, it was assumed that most

Table 4.12-1 Study Area Housing Characteristics

County/City	2000 Housing Units	2000 Vacant Housing Units	Vacancy Rate
Placer County	107,302	13,920	13.0%
Sacramento County	474,814	21,212	4.5%
Sutter County	28,319	1,286	4.5%
Total	**610,435**	**36,418**	**6.0%**
City of Sacramento	163,957	9,376	5.7%

Source: U.S. Census 2006
The city of Sacramento is included in the Sacramento County demographic numbers.

workers would commute up to 1 or 2 hours to the proposed Project site and that the entire labor force would come from within Sacramento, Placer, and Sutter counties. Furthermore, it was assumed that a major portion of the labor force would come from within the city of Sacramento because it is the major metropolitan center of the study area. Table 4.12-2 provides the total number of workers within the study area for 2000, including those identified as employed within the "construction" category in the California Employment Development Department's (EDD) labor force statistics (EDD 2006).

Table 4.12-2 Study Area Employment Characteristics

Location	2000
Sacramento County	
Total Workers	587,086
Construction Trades	37,223 (6.3%)
Unemployment Rate	38,961 (6.6%)
Sutter County	
Total Workers	35,470
Construction Trades	2,595 (7.3%)
Unemployment Rate	4,127 (11.6%)
Placer County	
Total Workers	123,875
Construction Trades	10,860 (8.8%)
Unemployment Rate	4,972 (4.0%)
City of Sacramento	
Total Workers	184,829
Construction Trades	9,804 (5.3%)
Unemployment Rate	14,543 (7.9%)

Source: U.S. Census 2006
Total workers includes both civilian and military employment

Economic Characteristics

Table 4.12-3 provides the median personal income, total taxable sales, taxable retail sales, and the percent contribution to the state of California sales for the three counties located within the study area for 2000. Placer County had the highest median personal income ($35,749) while Sutter County had the lowest ($24,278).

Table 4.12-3. Study Area Economic Characteristics

Location	2000
Sacramento County	
Median Personal Income (dollars)	$32,557
Total Taxable Sales (millions)	$16,593.7
Taxable Retail Sales (millions)	$11,072.5
Percent of Total California Taxable Sales	3.8%
Sutter County	
Median Personal Income (dollars)	$24,278
Total Taxable Sales (millions)	$1,020.5
Taxable Retail Sales (millions)	$708.1
Percent of Total California Taxable Sales	0.2%
Placer County	
Median Personal Income (dollars)	$35,749
Total Taxable Sales (millions)	$4,741.6
Taxable Retail Sales (millions)	$3,384.3
Percent of Total California Taxable Sales	1.1%

Source: California Department of Finance 2006

4.12.2 Environmental Consequences

4.12.2.1 Standards of Significance

A significant effect on socioeconomics would occur under the following conditions:

- Permanent and irreversible loss of work for a measurable number of community residents.
- Permanent displacement of existing residences or businesses; or division of a community to a point where interaction and communication between community groups is affected.
- Degradation or over-commitment of existing goods and services to an extent that would limit the sustainability of existing communities.

4.12.2.2 Environmental Protection Measures

Table 3-3 presents EPMs for socioeconomic issues that include standard practices applicable to temporary and long-term use of lands not owned by Western:

88. Any land temporarily required for construction of the proposed facilities (such as conductor pulling sites and material and equipment storage areas) would be arranged through temporary-use permits or by specific arrangements between the construction contractor and affected landowners. Discussions would be made with business owners to avoid or minimize disruptions in their business (by posting detours and limiting the area and time of disruption).
89. Where new ROW is needed, Western would acquire land rights (easements) in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646), as amended. Easements would be purchased through negotiations with landowners at fair market value, based on independent appraisals. The landowner would normally retain title to the land and could continue to use the property in ways that would be compatible with the transmission line.

4.12.2.3 Impacts from The Alternatives

Impacts to socioeconomics would be very similar for each alternative. Transmission line construction would create new temporary jobs for construction workers and temporarily cause a positive increase in income and related economic activity in the affected counties. These impacts, along with the significant amount of material to be purchased to construct the transmission line, would increase revenue for some businesses and create a minor increase in the tax revenue received by local and state agencies. Some material would be purchased from businesses within the study area.

The proposed Project construction would be conducted in stages; therefore, personnel would not be working on all tasks simultaneously at a given location. Construction activities would require the employment of about 25 construction workers. As shown in Table 4.12-2, a large construction workforce is available within the proposed Project area. This existing labor pool would likely be sufficient to meet the job opportunities generated by the proposed Project. This beneficial impact on worker employment and income would indirectly benefit local businesses when workers buy gas and food or as some workers stay in local motels.

The proposed construction areas are within commuting distance from residential communities in the area. Construction workers not hired locally would likely be accommodated by the vacant housing units in the area (see Table 4.12-1). The proposed Project would not create a demand for additional housing, so no impacts would occur on housing.

Construction activities would require the use of staging areas that could restrict business access during construction. While this type of temporary impact would likely not affect employees, proper signage would be posted in these areas to alert motorists that businesses are open and show detour routes to allow business access. Therefore, temporary access impacts during construction would not impact local employment levels.

The proposed Project would be constructed primarily within rural areas. In areas where the proposed Project would require new ROW, careful siting would occur to avoid any displacement of existing homes and businesses. In the event that business or residential structures would be displaced, Western would acquire land rights in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646), as amended. Western would purchase rights through negotiations with landowners at fair market value, based on independent appraisals. Landowners would retain title to the land and could continue to use the property in ways that would be

compatible with the transmission line. Displacement impacts would be less than significant.

Customers of utilities served by Western and SMUD would experience an increase in the reliability of their power supply. This long-term positive impact would lead to indirect economic benefits, including less frequent production losses at businesses during power outages and related reductions in income for business owners and their employees.

Operation of the transmission line would not induce a long-term population increase and is not anticipated to alter the existing economic base of the study area, as described in Table 4.12-3. Therefore, the proposed Project would have a less-than-significant impact on the economic vitality of the study area. An indirect, beneficial, long-term socioeconomic impact would be greater power system reliability for Western and SMUD's customers.

4.12.2.4 Impacts from the No Action Alternative

Under the No Action Alternative, no new transmission lines would be constructed. The risk of power outages could increase and outages could become more frequent and severe. Any outages would result in increasing widespread, negative socioeconomic impacts to local businesses, their employees, and perhaps the fiscal resources and related public services of affected agencies. The No Action Alternative could have a negative, indirect impact on socioeconomics, as power reliability would not improve to meet the anticipated higher demands from growth.

4.12.2.5 Cumulative Impacts

Currently, the study area of Placer, Sacramento, and Sutter counties has a stable economic base and adequate housing available. Past and present land use in the proposed Project area was primarily agricultural. The Sacramento Valley has seen population growth for the last 20 years and development is expected to continue in Sutter and Placer counties and extend north from the city of Sacramento into the study area, as further discussed in Section 4.9. Foreseeable development would increase construction employment, housing, and tax base within the study area.

4.12.2.6 Summary of Impacts

Essentially, no variation to socioeconomic impacts exists between alternatives. No significant direct, indirect, or cumulative impacts would be expected from the proposed Project or No Action Alternative.

4.13 SOILS

This section addresses soils within the study area and discusses constraints posed during construction, operation, and maintenance of the transmission line.

4.13.1 Affected Environment

The lower Sacramento Valley has many landforms. Nearly level floodplains exist along the Sacramento, Feather, and American Rivers and along the smaller creeks. Basin and terrace remnant landforms are in the American Basin, north of the American River and east of the Sacramento River. The most extensive area is the main valley floor, which extends from southern Sutter County through Sacramento County and is the primary area of the SEIS and EIR investigation. The main valley floor consists of nearly level, low terraces, basin rims, and local basins with slopes of less than 1 percent (U.S. Department of Agriculture (USDA) 1993).

Activities affecting soils would fall under Federal EPA regulations (40 CFR Part 122) requiring the permitting of storm water pollution under the National Pollutant Discharge Elimination System (NPDES). The California Regional Water Quality Control Board (RWQCB) has jurisdiction over the enforcement of the Storm Water Program in California. This agency regulates construction activities to control surface water runoff, contaminant transport and increased sedimentation in waterways.

4.13.1.1 Resource Study Area

The study area for the project extends from Sutter County to Sacramento and Placer counties. Soils data from Sacramento, Sutter, and Placer counties were used for this analysis.

4.13.1.2 Issues of Environmental Concern

Issues of environmental concern for soils include erosion, drainage, high water erodibility, steep slopes, compaction from construction disturbance, and potential impacts to existing access roads and new roads. These issues are somewhat heightened from the large number of ditches, canals, rivers and creeks, and the proximity of the water table to the land surface. Construction and maintenance could

cause sedimentation, loss of farmland, and revegetation. Construction of structures, footings, and access roads in areas with steep or unstable slopes could create hazardous conditions that may pose a threat of disruption to structures. Increased soil compaction and rutting in the transmission line corridor could occur during construction, operation, and maintenance of the transmission lines.

4.13.1.3 Characterization

The study area is in the central portion of California's Central Valley, within the Sacramento Valley. The primary land use types are irrigated cropland, livestock grazing, and urban development.

Tables 4.13-1 through 4.13-3 describe the soils that exist along the project alignment, which crosses Sutter, Sacramento, and Placer counties. Soil information was obtained from the Sutter, Sacramento, and Placer Soil Surveys prepared by the USDA Soil Conservation Service (USDA 1980, 1988 and 1993). Soil information generally includes data describing the physical and chemical properties of each individual soil type. Soil permeability and erosion factors are most pertinent to this investigation.

Table 4.13-1. Soils in Sutter County

Soil	Description	Permeability (In/hr)	Erosion Factor K* Scale (good 0.02 – 0.69 poor)
Oswald-Gridley-Subaco	Moderately deep, level to nearly level, poorly drained and moderately well-drained clay and clay loam; in basins and on basin rims	0.06 – 0.20	0.24 – 0.32
San Joaquin-Cometa	Moderately deep and very deep, level to nearly level, well-drained sandy loam and loam; on terraces	0.60 – 2.00	0.24 – 0.32
Shanghai-Nueva-Columbia	Very deep, level to nearly level, somewhat poorly drained silt loam, loam, and fine sandy loam; on floodplains	0.60 – 6.00	0.24 – 0.49
Clear Lake–Capay	Deep and very deep, level to nearly level, poorly drained and moderately well-drained clay and silty clay; in basins and on basin rims	0.06 – 0.20	0.24 – 0.32

Source: U.S. Department of Agriculture 1988

* Erosion Factor K—The erosion factor K indicates the susceptibility of a soil to sheet and rill erosion.

In/hr: = Inches per hour

The estimates are based on percentage of silt, very fine sand, sand, and organic matter (as much as 4 percent) and on soil structure and permeability.

Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion.

Table 4.13-2. Soils in Sacramento County

Soil	Description	Permeability (In/hr)	Erosion Factor K* Scale (good 0.02 – 0.69 poor)
Sailboat-Scribner-Cosumnes	Somewhat poorly drained and poorly drained soils that have a seasonal high water table and are protected by levees	0.06 – 2.0	0.24 – 0.43
Columbian-Cosumnes	Somewhat poorly drained soils that are subject to flooding or are protected by levees	0.06 – 6.0	0.28 – 0.43
Clear Lake	Somewhat poorly drained soils that have a seasonal high water table, are protected by levees and are very deep or deep over a cemented hardpan	0.06 – 0.20	0.24 – 0.32
San Joaquin	Moderately well-drained soils that are moderately deep over a cemented hardpan	0.06 – 2.0	0.24 – 0.37

Source: U.S. Department of Agriculture 1993

* Erosion Factor K—The erosion factor K indicates the susceptibility of a soil to sheet and rill erosion,

In/hr: Inches per hour

The estimates are based on percentage of silt, very fine sand, sand, and organic matter (as much as 4 percent) and on soil structure and permeability.

Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion.

Table 4.13-3. Soils in Placer County

Soil	Description	Permeability (In/hr)	Erosion Factor K* Scale (good .02 - .69 poor)
Fiddyment-Cometa-Kaseberg	Undulating to rolling, deep to shallow, well-drained soils that are underlain by siltstone; on terraces	0.60 – 2.0	0.24 – 0.43

Source: U.S. Department of Agriculture 1980
* Erosion Factor K—The erosion factor K indicates the susceptibility of a soil to sheet and rill erosion.
In/hr: = Inches per hour
The estimates are based on percentage of silt, very fine sand, sand, and organic matter (as much as 4 percent) and on soil structure and permeability.
Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion.

Soils in Segment 1 include Oswald-Gridley-Subaco, San Joaquin-Cometa, Shanghai-Nueva-Columbia, and Clear Lake-Capay series. These soil types have low-to-moderate permeability and a moderate erosion factor. Segments 2A1, 2A2, 2A3, 2A4, and 2A5 are located in both Sutter and Sacramento counties and include primarily Clear Lake-Capay and San Joaquin soils. These soil types have low-to-moderate permeability and a moderate erosion factor. Segments 2B and 2C are located in Sutter, Sacramento, and Placer counties and include the same soils as above. Additionally, Placer County is composed of Fiddyment-Cometa-Kaseberg soils. These soil types have low permeability and a moderate erosion factor. Segment 3 is located in Sacramento County and includes Clear Lake, San Joaquin and Columbia-Cosumnes soils. These soil types have low permeability and a moderate erosion factor.

Additional soil data are available from the soil surveys (USDA 1980, 1988 and 1993). This includes information pertaining to the soil depth, texture, plasticity, clay content, bulk density, water capacity, salinity, shrink-swell potential, and wind erodibility. This information is used to classify the type of soil.

4.13.2 Environmental Consequences

Soils could be impacted by construction and maintenance of the transmission line and associated access roads. Potential impacts would be limited to the ROW for the transmission line, pulling and tensioning sites, material storage yards, and access roads.

4.13.2.1 Standards of Significance

A significant effect to soils would occur under the following conditions:

- Loss of topsoil or contamination, causing a decline in agricultural or habitat productivity;
- Erosion or siltation, resulting in measurable contribution to air or water degradation; or
- Increase in soil compaction such that current use or regenerative growth would be permanently altered.

4.13.2.2 Environmental Protection Measures

EPMs for soil resources from Table 3-3 include the following:

62. Surface restoration would occur in construction areas, material storage yards, structure sites, spur roads, and existing access roads where ground disturbance occurs or where recontouring is required.
63. Access roads would be built at right angles to the streams and washes to the extent practicable. Culverts would be installed where needed. All construction and maintenance activities would be conducted to minimize disturbance to vegetation and drainage channels.
64. Excavated material or other construction materials would not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters.
65. Non-biodegradable debris would be collected and removed from the ROW daily and taken to a disposal facility. Slash and other biodegradable debris would be left in place or disposed of.
66. All soil excavated for structure foundations would be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations.

Excess soil would be removed from the site and disposed of appropriately. Areas around structure footings would be reseeded with native plants.

69. A California-registered Professional Geotechnical Engineer would evaluate the potential for geotechnical hazards and unstable slopes on the centerline route and areas of new road construction or widening on slopes with more than a 15 percent gradient.

75. On completion of the work, all work areas except permanent access roads would be returned to pre-construction conditions unless otherwise specified by the land owner/ manager.

89. Erosion control measures would be implemented to prevent loss of soil. Construction would be in conformance with Western's *Integrated Vegetation Management Environmental Guidance Manual.*

90. If wet areas cannot be avoided, Western would use wide-track or balloon tire vehicles and equipment and/or timber mats.

91. All construction vehicle movement outside of the ROW normally would be restricted to approved access or public roads.

92. Where feasible, all construction activities would be rerouted around wet areas while ensuring that the route does not cross sensitive resource areas.

93. Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses would be conducted to prevent muddy water and eroded materials from entering the streams or watercourses.

100. Runoff from the construction site would be controlled and meet RWQCB storm water requirements and the conditions of a construction storm water discharge permit. A storm water pollution prevention plan would be prepared and implemented.

4.13.2.3 Impacts from Alternatives

Soil impacts are proportional to the area of surface disturbance (from construction of structures and access roads). Table B-1 presents the soil disturbances that would occur for each alternative. Short-term disturbances would result from construction of material storage yards, access roads, structures, and pulling sites. Long-term disturbances would result from structures and access roads.

Construction would require local grading that would alter the topography. Grading could create unstable cut-and-fill slopes, especially on steep slopes and areas with weak rock materials. Most grading would be required for construction of suitable footings for the transmission structures. Grading also would be required for access roads and construction pads for structure sites on steep slopes to provide safe, level surfaces for excavation equipment, cranes, bucket trucks, and structure assembly. Hazards from unstable slopes and seismic events could affect roads. Debris clearing and road repair would be required as a normal response to such events.

Construction activities that disturb one or more acre are required to comply with the NPDES General Permit and Waste Discharge Requirements for discharges of storm water associated with construction activity (SWRCB issued Order No. 99 08 DWQ). This permit requires the minimization or elimination of storm water discharges from the site; and monitoring measures that control construction materials and wastes, erosion, and sedimentation. In accordance to provisions of the General Permit, construction activities must follow a Storm Water Pollution Prevention Plan (SWPPP) and associated Monitoring and Reporting Plan.

The proposed Project would not result in significant impacts because EPMs described above and the SWPPP would be enforced during construction and maintenance of the transmission line. Western would follow its erosion control and revegetation procedures to minimize potential erosion and sedimentation impacts to downstream resources. EPMs also would minimize impacts on soil compaction that could potentially affect the time required for successful revegetative growth or current use such as agricultural.

Soil erosion on construction sites cannot be eliminated, but with the application of EPMs and the SWPPP, it can be minimized; therefore, soil impacts would be less than significant.

4.13.2.4 Impacts from the No Action Alternative

Under the No Action Alternative, the existing transmission lines between O'Banion and Natomas Substations would continue to be operated and

maintained. The line would be periodically accessed for routine maintenance or emergency repairs along the existing ROWs and access roads.

4.13.2.5 Cumulative Impacts

The Sacramento Valley floor consists of nearly level, low terraces, basin rims, and local basins with slopes of less than one percent. Soil types in the proposed Project Area have low to moderate permeability, with moderate erosion factors. Past and present land use in the proposed Project area was primarily agricultural. Agricultural operations can result in high soil erosion from wind, water, and tillage.

Future land use would include residential and commercial development within the proposed Project area that may increase the risk of erosion and compaction of soils from construction. These risks would be minimized through implementation of sound construction principles enforced by regulatory agencies.

The proposed Project, in combination with reasonably foreseeable projects, would not result in erosion or siltation that would lead to measurable air or water degradation and would not result in a loss of topsoil that would cause a measurable decline in agricultural or habitat uses. Therefore, no cumulative impacts would occur to soils.

4.13.2.6 Summary of Impacts

No significant direct, indirect, or cumulative impacts to soils would be expected from any of the proposed Project alternatives.

4.14 TRAFFIC AND TRANSPORTATION

4.14.1 Affected Environment

This section analyzes the potential effects on traffic and transportation resulting from construction and operation of the proposed Project. The analysis primarily quantifies impacts on roadway levels of service expected during proposed Project construction.

4.14.1.1 Resource Study Area

The study area related to transportation includes roads within 0.5 mile of the segment corridors and crossed overhead by the proposed Project within Sacramento, Sutter, and Placer counties.

4.14.1.2 Issues of Environmental Concern

Issues of environmental concern would be traffic disruption and congestion that would occur during the construction phase. A transmission line is more likely to affect local traffic during construction rather than operation because there is typically only a minimal amount of roadway activity required to maintain a transmission line (on average, less than one vehicle trip per day). Scoping comments identified concerns about how the proposed Project might affect planned transportation corridors.

4.14.1.3 Characterization

The proposed Project is located in the Greater Sacramento Area (GSA) in California. The GSA includes El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties and is served by an extensive transportation system, including interstate freeway, highway, airport, deep-water shipping channel, and rail facilities. The proposed Project can be accessed from State Route 99 (SR 99), State Route 70 (SR 70), State Route 113 (SR 113), and along a variety of local access routes. These routes are under the jurisdiction of the California Department of Transportation (Caltrans).

The northwest corner of Sacramento County is serviced by Sacramento Regional Transit (RT). Two bus routes are within 0.5 mile of the proposed Project area. Proposed Project areas in south Sutter County and western Placer County are not serviced by any local transit routes or rail service.

Within the study area, no major airports or airfields intersect or overlap with the proposed Project. Sacramento International Airport is within 2 miles of the proposed Project. Sacramento International Airport is located in the northwest corner of Sacramento County, just north of I-5 and west of SR 99, and is the primary airport for commercial air traffic in the GSA. Another public airfield, Rio Linda Airport, is about 2 miles east of the proposed Project. Freedom Field, a private airfield used for ultralight airplanes, is about 0.5 mile east of Segment $2C_1$, MP 6.7. A few small private airstrips, used for crop dusting, are near the study area: two airstrips near Segment 1, MP 16 (about 1.1 miles west and 0.75 mile east); the Tenco Tractor airstrip about 1.4 miles east of the 2A segments, MP 4.5; and the Riego Flight Strip about 1.5 miles east of the 2A segments, MP 5.7.

Segment 1

Segment 1 would start at Western's O'Banion Substation and parallel the Sutter Bypass, crossing the following Sutter County roads: Thompson Road, Everglade Road, SR 113, Sawtelle Avenue, and Sacramento Avenue. Following the Feather River crossing, the alignment would cross the following roads: Garden Highway, Lee Road, Power Line Road, Striplin Road, and Catlett Road. Just south of the SR 70/99 split, the alignment would cross SR 70/99, then West Catlett Road, where it would continue to Segment 2. Just south of the SR 70/99 split, the Segment 1 alignment would cross SR 70/99.

Segment 2A1

Segment 2A1 would parallel SR 99 for approximately 5.1 miles, crossing the following Sutter County roads: Howsley Road, Sankey Road, and Riego Road. If located to the west of SR 99, the alignment would cross to the west side of SR 99 at Levee Road, and then back again at Riego Road. If located to the east of SR 99, these crossings would not be needed. The alignment would then proceed east about 2.4 miles on the south side of Riego Road and turn south to parallel East Levee Road for about 3.5 miles, crossing the Sutter County line into Sacramento County. The alignment would cross Elverta and East Levee roads before intercepting SMUD's existing Elverta-Natomas Transmission Line south of the Elverta Substation.

A new interchange for SR 99 at Riego Road and widening of Riego Road from SR 99 to Placer County are planned for 2009 to 2010 in the Segment 2A1 area.

Segment 2A2

Segment 2A2 would parallel SR 99 for approximately 6.1 miles, crossing the following Sutter County roads: Howsley Road, Sankey Road, and Riego Road. If located to the west of SR 99, the alignment would cross to the west side of SR 99 at Levee Road, and then back again at the Sutter/Sacramento county line. If located to the east of SR 99, these crossings would not be needed. The alignment would then follow the north side of the Sutter/Sacramento County line for about 2.5 miles. The alignment would turn south to parallel East Levee Road for about 2.3 miles, entering Sacramento County and crossing Elverta and East Levee roads before intercepting SMUD's existing Elverta-Natomas Transmission Line south of the Elverta Substation.

Segment 2A3

Segment 2A3 would parallel SR 99 for approximately 7.7 miles, crossing the following Sutter County roads: Howsley Road, Sankey Road, and Riego Road, before entering Sacramento County. If located to the west of SR 99, the alignment would cross to the west side of SR 99 at Levee Road, and then back again at Elverta Road. If located to the east of SR 99, these crossings would not be needed. The alignment would then follow the north side of Elverta Road for about 2.4 miles. The alignment would turn south to parallel East Levee Road for about 0.8 mile, crossing Elverta and East Levee roads before intercepting SMUD's existing Elverta-Natomas Transmission Line south of the Elverta Substation.

Comments were received during scoping regarding a planned interchange at SR 99 and Elverta Road. The interchange expansion is planned for 2014. The proposed Project would be completed before that time and would not interfere with the interchange expansion.

Segment 2A4

Segment 2A4 would parallel SR 99 for approximately 9.8 miles, crossing the following Sutter County roads: Howsley Road, Sankey Road, and Riego Road, before entering Sacramento County and crossing Elverta Road. If located to the west of SR 99, the alignment would cross to the west side of SR 99 at Levee Road, and then back again at Elkhorn Boulevard. If located to the east of SR 99, these additional crossings would not be needed. The alignment would then follow the north side of Elkhorn Boulevard for about 2.8 miles to East Levee Road, where it would intercept SMUD's existing Elverta-Natomas Transmission Line.

The widening of Elkhorn Boulevard to four lanes from Rio Linda Boulevard to SR 99 is a planned transportation project for 2010 in the Segment 2A4 area. The Sacramento International Airport is located 2 miles west of Segment 2A4.

Segment 2A5

Segment 2A5 would parallel SR 99 for approximately 7.1 miles, crossing the following Sutter County roads: Howsley Road, Sankey Road, and Riego Road and entering Sacramento County. If located to the west of SR 99, the alignment would

cross to the west side of SR 99 at Levee Road, and then back again at the proposed Community Separator. If located to the east of SR 99, these crossings would not be needed. The alignment would follow the proposed Community Separator for about 2.8 miles to East Levee Road, then proceed south about 1.2 miles, crossing Elverta and East Levee roads before intercepting SMUD's existing Elverta-Natomas Transmission Line south of the Elverta Substation.

Segment 2B

Segment 2B would cross the following Sutter County roads: Howsley Road at the intersection of Pacific Avenue, Fifield Road, Keys Road, Sankey Road, Pleasant Grove Road, and Riego Road. Alternative 2B would cross into Placer County at the intersection of Riego and Pleasant Grove roads and cross Rio Linda Boulevard at the Sacramento County border. The alternative would then cross Elverta Road before intercepting SMUD's existing Elverta-Natomas Transmission Line south of the Elverta Substation.

The realignment and widening of Pleasant Grove Road to four lanes from Howsley Road to Riego Road is a planned transportation project for 2010 in the Segment 2B area.

RT Bus Route 19, which travels along Elverta Road between Watt Avenue and Rio Linda Boulevard, is approximately 0.5 mile east of Segment 2B.

Segment 2C

Segment $2C_1$ would cross the following Sutter County roads: Pacific Avenue, Howsley Road, Fifield Road, Keys Road at the intersection of Pleasant Grove Road, and Sankey Road. The alignment would then cross Riego Road into Placer County. Segment $2C_1$ would cross Rio Linda Boulevard at the Sacramento County border, then cross Elverta Road before intercepting SMUD's existing Elverta-Natomas Transmission Line near the Elverta Substation. Segment $2C_1$ is approximately 0.5 mile west of RT Bus Route 19, as described above.

The realignment and widening of Pleasant Grove Road to four lanes from Howsley Road to Riego Road is a planned transportation project for 2010 in the Segment $2C_1$ area.

Segment $2C_2$ would begin near the intersection of Keys Road and Locust Road in Sutter County, crossing Locust Road. After crossing into Placer County, the alternative would cross South Brewer Road and Country Acres Lane. Near Phillip Road, the alignment would proceed south, intercepting the Fiddyment-Elverta Transmission Line.

Segment 3

Segment 3 would proceed south from the Elverta Substation, crossing East Levee Road, Elkhorn Boulevard, Del Paso Road, and Striker Avenue before intercepting the Natomas Substation.

RT Bus Route 14, which travels along Del Paso Road from Norwood Avenue to Northgate Boulevard, is approximately 0.5 mile east of Segment 3.

The planned Downtown Natomas Airport light rail expansion from downtown Sacramento to the Sacramento Airport would be located near Segment 3. A light rail station for the Downtown Natomas Airport is planned at the intersection of Natomas Boulevard and Del Paso Road, near the Natomas Substation at Segment 3. The light rail would then proceed northwest along East Commerce Parkway, travel west 0.5 mile parallel to Elkhorn Boulevard, then turn slightly south at Power Line Road, before proceeding north to the Sacramento International Airport terminal. The Downtown Natomas Airport light rail expansion is at the draft EIS and EIR planning stage, with construction not expected until 2014 or beyond.

Level-of-Service Analysis

Local governments use the Level of Service (LOS) criteria, as defined by the 2000 *Highway Capacity Manual* (Transportation Research Board 2000), to assess the performance of their street and highway system and roadway capacity. Traffic flow characteristics for different LOS are presented in Table 4.14-1 and are defined in terms of their volume to capacity (V/C) ratio. Sutter County uses LOS D as the minimum acceptable standard. Sacramento County uses LOS D for rural areas and LOS E for urban areas as the minimum acceptable standards. Placer County uses LOS C on roadways, except within 0.5 mile of state highways, where the acceptable standard is LOS D.

A change in the V/C ratio equal to or less than 0.05 is within the day-to-day variability of traffic during the peak hour. When the increase in the V/C ratio exceeds 0.05, most drivers perceive an increase in traffic congestion. Both the city of Sacramento and Sacramento County use this threshold of significance.

Table 4.14-1 Level of Service Criteria

LOS	V/C Ratio	Description
A	0.00 to 0.59	Free flow/insignificant delays
B	0.60 to 0.69	Stable operation/ minimal delays
C	0.70 to 0.81	Stable operation/acceptable delays
D	0.82 to 0.89	Approaching unstable/tolerable delays
E	0.90 to 0.99	Unstable operation/significant delays
F	1.00	Forced flow/excessive delays

Source: Transportation Research Board. 2000.
LOS = Level of Service
V/C = Traffic volume to capacity ratio

Existing Conditions

Table 4.14-2 shows existing traffic volumes on local roadways in the study area. Existing traffic volume data were obtained from Caltrans, city of Sacramento, Sutter County, and the Placer County Public Works Department.

4.14.2 Environmental Consequences

4.14.2.1 Standards of Significance

A significant effect on traffic would occur under the following conditions:

- An increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system;
- Exceedance, either individually or cumulatively, of an LOS standard established by local governments for designated roads or highways;
- A change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Conflict with adopted policies, plans, or programs supporting alternative transportation;
- Major traffic delays for a substantial number of motorists; or
- Physical damage to roads that is not repaired to a level equal to, or better than, what existed prior to construction.

4.14.2.2 Environmental Protection Measures

EPMs for traffic issues from Table 3-3 include the following:

70. Conform with safety requirements for maintaining the flow of public traffic and conduct construction operations to offer the least possible obstruction and inconvenience to public transportation.

73. Mark structures and/or shield wire with highly visible devices for identified locations, as required by applicable laws and regulations (for example, the Federal Aviation Administration regulations).

94. Prior to the start of construction, Western would submit traffic control plans to all agencies with jurisdiction of public roads that would be affected by construction activities.

95. Western would restrict all necessary lane closures or obstructions on major roadways associated with construction activities to off-peak periods to mitigate traffic congestion and delays.

96. Western would ensure that roads or sidewalks damaged by construction activities would be properly restored to their preconstruction condition.

4.14.2.3 Impacts from Alternatives

Each of the alternatives would have similar impacts on traffic. Proposed Project construction was divided into seven phases. Estimated personnel and

Table 4.14-2 Traffic Volume and Level of Service

Name	Average Daily Design Capacity[a]	Existing Traffic Conditions			Traffic with Construction Trips Added		
		Average Daily Traffic Volume[b,c,d,e,f]	V/C	LOS	New Average Daily Traffic Volume	New V/C	New LOS
SR 70 at SR 99 Junction	80,000	15,800	0.20	A	15,934	0.20	A
SR 99 at Sacramento County Line	80,000	38,500	0.48	A	38,634	0.48	A
SR 99 at Elkhorn Blvd.	80,000	53,000	0.66	B	53,134	0.66	B
SR 99 at Elverta Rd.	80,000	43,500	0.54	A	43,634	0.55	A
SR 99 at Sacramento Ave.	80,000	32,000	0.40	A	32,134	0.40	A
SR 113 at SR 99 Junction	18,000	8,600	0.48	A	8,734	0.49	A
Elverta Rd east of El Centro	18,000	7,155	0.40	A	7,289	0.40	A
Rio Linda Blvd at Main	18,000	4,422	0.25	A	4,556	0.25	A
East Levee Rd at Elkhorn Blvd	15000	1,636	0.11	A	1,770	0.12	A
Elkhorn Blvd at Natomas Blvd	18,000	7,914	0.44	A	8,048	0.45	A
Baseline Rd west of Fiddyment Rd	18,000	4,795	0.27	A	4,929	0.27	A
Fiddyment Rd north of Baseline Rd	18,000	2,660	0.15	A	2,794	0.16	A
O'Banion Rd at Garden Highway	15,000	1,104	0.07	A	1,238	0.08	A
Catlett Rd. at Pleasant Grove Rd	15,000	468	0.03	A	602	0.04	A
Howsley Rd at Natomas Rd	15,000	2,704	0.18	A	2,838	0.19	A
Lee Rd at Garden Highway	15,000	161	0.01	A	295	0.02	A
Natomas Rd at Riego Rd	15,000	712	0.05	A	846	0.06	A
Pleasant Grove Rd at Riego Rd	18,000	1,842	0.10	A	1,976	0.11	A
Riego Rd at Placer County Line	18,000	9,405	0.52	A	9,539	0.53	A
Sankey Rd at Natomas	15,000	907	0.06	A	1,041	0.07	A
Striplin Rd at SR 99/70	15,000	162	0.01	A	296	0.02	A

[a] Transportation Research Board (2000)
[b] Caltrans (2006)
[c] Sacramento County (2006)
[d] City of Sacramento (2006b)
[e] Allison (2006) Sutter County
[f] Jacobson (2006) Placer County
V/C: Traffic volume to capacity ratio
LOS: Level of service

equipment requirements for each phase are presented in Table 3-2. Construction traffic for each phase is shown in Table 4.14-3. This phased approach of construction would spread traffic impacts along the line and over time. The following assumptions were made for this analysis:

- Peak hour trips would account for 25 percent of the total daily trips, or one trip, whichever is greater; and
- Construction trucks are equivalent to three passenger cars.

Table 4.14-3. Maximum Daily Construction Traffic

Stringing Phase Equipment	Daily Trips	Peak Hours Trip (morning peak)
Pullers	2	1
Tensioners	2	1
Bulldozers	2	1
Reel Trailers	24	6
Materials Truck	6	2
Manlifts	12	3
Pickup Trucks	30	8
Light Truck	6	2
Worker Passenger Vehicles	50	13
Total	**134**	**37**

Source: Western 2006

Based on the information provided in Table 3-2, maximum traffic impacts would occur during the stringing phase, which would require the most vehicle trips. Table 4.14-3 presents the maximum daily construction traffic for the stringing phase. Potential impacts were analyzed for the morning peak hour because the highest number of construction trips would be expected at the start of the day.

The increase in vehicle traffic from the proposed Project was added to the average daily traffic data for roads in the proposed Project area. The V/C ratio and LOS were evaluated with the increased construction traffic volume and results are shown in Table 4.14-2. The increased volume caused by construction traffic from the proposed Project would not increase the V/C ratio more than 0.01 or increase the LOS of any of the roads in the area. In addition, the linear nature of the proposed Project would distribute traffic impacts intermittently along the proposed Project area. All roads in the proposed Project area would continue to operate at acceptable LOS. Therefore, traffic-related impacts caused by proposed Project construction would be less than significant.

The proposed Project would not be located within Sacramento International Airport airspace; therefore, no aviation impacts would be associated with the proposed Project. The proposed Project is located at least 0.5 mile from all RT bus routes, so no impact to public transit would occur. The proposed Project would have no impact on the Downtown Natomas Airport light rail expansion. Western would work with local transportation planners to ensure that proposed Project construction would have no impact on planned transportation corridors.

Traffic impacts from additional construction vehicles are not significant for any portion of the proposed Project; however, when roads are crossed overhead by stringing operations, minor temporary traffic impacts may occur. During stringing, traffic typically will be slowed (less than 25 miles per hour) for 4 to 6 hours, and could be stopped for 5 minute intervals at five different times in a given day. Stringing across any given road would not be expected to take longer than a day. Western's traffic EPMs will reduce these impacts.

Construction and maintenance could temporarily interfere with the use of local roadways or driveways. Heavy construction equipment may cause damage to study area roadways or driveways. Western's EPMs would preclude and reduce the magnitude of such impacts. These EPMs include using detours, limiting the area and duration of traffic impacts by carefully siting staging areas and construction traffic routes, making arrangements with local business owners and residents, and repairing any damage that may occur to roadways or driveways during construction.

The proposed Project would require at least one Caltrans Encroachment Permit, where Segment 1 crosses over SR 70/99 near Catlett Road in Sutter County. In addition, if the west alignment of Alternatives A1 through A5 is selected, two

additional encroachment permits would be required where the transmission lines cross over SR 99.

Future transportation projects planned in the study area include widening Pleasant Grove and Riego roads and Elkhorn Boulevard and constructing new interchanges at SR 99 and Riego and Elverta roads. The road widening and interchange activities would occur near all of the proposed Project alternatives and Western and SMUD would work cooperatively with municipal and state agencies to ensure that the transportation projects are not impacted and that the LOS standards can be achieved.

4.14.2.4 Impacts from the No Action Alternative

Transmission lines would not be constructed under the No Action Alternative. Therefore, vehicle traffic would not increase and no significant impacts would occur. Roads in the area would continue to operate at existing conditions.

4.14.2.5 Cumulative Impacts

The Greater Sacramento Valley is served by an extensive transportation system, including interstate freeway, highway, airport, deep-water shipping channel, and rail facilities. The primary regional transportation concern is vehicular traffic on local roadways. At present, approximately 92 percent of the trips taken by people in the project area are by car.

Roads in the proposed Project area all operate at an acceptable LOS. The temporary additional construction traffic generated by the proposed Project would not increase the LOS for any of the affected roads. Operations and maintenance activities would have no direct impact on traffic. The proposed Project would not impact air, rail, or public transportation in the present or future. Therefore, the proposed Project and the No Action Alternative would have no direct or indirect impact on traffic.

Future planned development may change the proposed Project area from agricultural to residential, commercial, and industrial development uses. Future transportation projects planned in the area include the widening of Pleasant Grove and Riego roads and Elkhorn Boulevard and new interchanges at SR 99 and Riego and Elverta roads. These improvements would improve traffic flow in the proposed Project area. Future development in the area would require road improvements to mitigate traffic impacts. Therefore, no cumulative impact would occur to traffic and transportation.

4.14.2.6 Summary of Impacts

The alternatives having the least impacts to traffic and transportation would be Alternatives A2 and A5 which impact the fewest number of roads. The route option to the west of SR 99 would require two additional crossings of SR 99 and have a greater impact on traffic than the route option east of SR 99. While minor differences exist in levels of disturbance, none of the alternatives would have significant direct, indirect, or cumulative impacts on traffic or transportation.

4.15 VISUAL RESOURCES

4.15.1 Affected Environment

This section identifies and describes visual resources, including visual quality and sensitivity that could be affected by construction, operation, and maintenance of the proposed Project. Visual quality is the degree of harmony, contrast, and variety within a landscape. Pleasant landscapes generally have high visual quality. Landscapes of high visual quality may contain distinctive landforms, vegetation patterns, and/or water forms. Visual sensitivity is the concern by viewers toward change to visual quality. Visual sensitivity is higher in natural or unmodified landscapes.

4.15.1.1 Resource Study Area

The visual resources study area consists of viewsheds where the proposed Project could be seen from sensitive viewing locations such as travel routes, residences, and recreation areas. For most of the segments, generally, there are vantage points within 0.5 mile of proposed transmission lines that afford viewing opportunities from foreground and middleground. Foreground is defined as that portion of the landscape from the viewer’s vantage point to 0.5 mile away. Middleground is defined as that portion of the landscape from 0.5 to 4 miles away from the viewer. Some proposed Project features would be visible in the background (4 miles to horizon), but all background landscapes also would be seen in greater detail and from closer distances from other vantage points. Therefore, for this SVS SEIS and EIR, the study area of this visual analysis would be limited to foreground and middleground viewing distances from travel routes and use areas named above.

4.15.1.2 Issues of Environmental Concern

Environmental issues related to visual impacts include the potential effects on landscapes of high visual quality, altering the existing landscape, and altering existing sensitive viewsheds from residential receptors and key viewpoints.

4.15.1.3 Characterization

The proposed Project would be located in the Central Valley of California. Few distinctive landforms, water forms, or vegetative patterns are present. Existing transmission lines crisscross many portions of the study area.

Segment 1

The visual quality around the O'Banion Substation is average with no distinctive landscape features. The general visual setting for Segment 1 is agriculture and rural residences, and the visual quality ranges from moderate to low because of the flat landscape, common vegetation patterns, and landscape modifications. Several existing transmission lines reduce the visual quality. In some locations, particularly in visual proximity, these transmission lines dominate views and attract viewer attention. The only aesthetic feature within Segment 1 is the Feather River, which Segment 1 would cross. The river is a distinctive water form feature, resulting in an area of high visual quality. The visual sensitivity along Segment 1 is moderate, resulting from landscape modifications, including existing transmission lines.

Segment 2

Three alternative alignments were considered for Segment 2: Segments 2A, 2B, and 2C. Segment 2A was further divided into Segments 2A1, 2A2, 2A3, 2A4, and 2A5 to evaluate each side of SR 99 and the various west-to-east routes between SR 99 and points near East Levee Road. The viewpoints from which sensitive receptors would see Segments 2A, 2B, and 2C and that define the study area viewsheds, are shown in Figure 4.15-1. Figures 4.15-2 to 4.15-5 present photographs along Segments 2A1, 2A2, 2A3, 2A4, 2A5, 2B, and 2C.

Segment 2 alternatives would travel south along the east side of SR 99, and then proceed east along one of five alternatives:

- Segment 2A1 would proceed along Riego Road.
- Segment 2A2 would proceed along the Sacramento/Sutter County Line.
- Segment 2A3 would proceed along Elverta Road.
- Segment 2A4 would proceed along Elkhorn Boulevard.
- Segment 2A5 would proceed along a Community Separator planned by the City of Sacramento north of Elverta Road.

Segment 2A4 would connect directly to the Elverta-Natomas Transmission Line south of the Elverta Substation. Segments 2A1, 2A2, 2A3, and 2A5 would turn south to intercept SMUD's existing Elverta-Natomas Transmission Line south of the Elverta Substation. SR 99 is well known for scenic agricultural landscapes and small, vibrant urban communities. However, the visual sensitivity from freeways in the Sacramento metropolitan area is low to moderate. There is no appreciable difference in views or landscapes when comparing the east and west sides of SR 99. Figures 4.15-2 and 4.15.-3 present existing visual conditions along the Segment 2A corridors that contain rural roads, flat-shrub open space, farmland, rural access roadway, distant rural residences, and existing distribution/transmission lines.

Segments 2A1, 2A3, and 2A4 run adjacent to existing distribution or transmission lines that are prominent components of the visual landscape and the visual quality of the routes does not contain any rare, unique, scenic, or sensitive views.

Segments 2A2 and 2A5 bisect agricultural fields and TNBC properties, and do not have existing prominent distribution or transmission lines. The visual quality of the routes does not contain any rare, unique, scenic, or sensitive views.

Figures 4.15-4 and 4.15-5 present existing visual conditions along Segment 2B and 2C corridors that contain rural highway, rural flat-shrub open space, agriculture, existing transmission lines, rural residences, and the Pleasant Grove Creek Canal.

Segments 2B and 2C run adjacent to existing transmission lines along Pleasant Grove Road that are prominent components of the visual landscape and pass the Pleasant Grove Creek Canal and rural residences. The Pleasant Grove Creek Canal is a drainage structure, rather than a recreational waterway, and does not exhibit characteristics of a rare, unique, scenic, or sensitive view area.

The visual conditions for the western part of Segment $2C_2$ include existing transmission lines within a rural setting. The West Roseville Open Space Preserve and the City of Roseville's Sphere of Influence border Segment $2C_2$ to the east. The viewshed includes an existing transmission line approximately 1.5 miles to the west from the edge of the preserve.

Segment 3

Segment 3 runs through urban and grassland landscapes. The American River Parkway, a wild and scenic river (National Wild and Scenic River System 2007), is located about 3 miles south of Natomas Substation; however, new developments have compromised this viewshed. Visual quality is average to low from extensively modified landscapes. The viewshed contains a network of transmission lines, telephone lines, and communication towers, with transmission lines dominating the visual setting. Around the Elverta and Natomas Substations, the visual setting is an expansive, flat valley floor contained by rolling hills rising to ridgelines. A number of transmission lines feed in and out of the Elverta and Natomas Substations, and draw visual attention. Although the landscape contains varied topography, modifications from structures have resulted in an average visual quality.

4.15.2 Environmental Consequences

Maintenance and construction activities could potentially impact scenic quality and the viewer's experience resulting from the visual intrusion of construction vehicles, equipment, and workers. The proposed Project could create visual impacts from new transmission lines.

4.15.2.1 Standards of Significance

A significant effect to visual resources would occur under the following conditions:

- Cause a visual interruption that would dominate a rare, unique, scenic, or sensitive viewshed; and
- Conflict with or violate a formal, visual resources plan or policy, applicable to the study area and approved or adopted by a Federal, state, or local agency having jurisdiction.

4.15.2.2 Environmental Protection Measures

One EPM for visual resources from Table 3-3 includes the following:

97. Transmission line construction design would use monopoles whenever possible, rather than lattice structures.

4.15.2.3 Impacts from Alternatives

For all alternatives, the Feather River and the American River Parkway are considered to be sensitive viewsheds of high visual quality. Existing transmission lines cross the Feather River and new developments exist within the viewshed of the American River Parkway that disrupt the horizon and views of the transmission lines. Therefore, the proposed Project's apparent, long-term visual interruption would be less than significant. Direct temporary impacts would result from construction and maintenance activities that interrupt or obstruct viewsheds. However, because of the relatively short duration of the activities, these impacts on the visual resources would be less than significant.

Alternatives A1, A3, and A4 would run adjacent to existing distribution or transmission lines that are prominent components of the visual landscape and the visual quality of the routes do not contain any rare, unique, scenic, or sensitive views. Therefore, visual impacts would be less than significant.

Under Alternatives A2 and A5 new transmission lines would bisect or be located adjacent to TNBC and the Sacramento Community Separator. These areas are considered sensitive viewsheds, but all areas have existing transmission lines within their middleground viewing distances and visual impacts would be less than significant.

Alternatives B and C would be constructed adjacent to the Pleasant Grove Creek Canal and rural residences; however, the visual quality of the area would not change considerably and no noticeable aesthetic change would occur to the typical viewer.

Alternative C, Segment $2C_2$ would construct a new transmission line located adjacent to West Roseville Preserve that is part of the City of Roseville's western boundary. The City of Roseville General Plan Growth Management Element contains a visual quality policy goal for new development west of Fiddyment Road to be consistent with the City's desire to establish view preservation corridors that provide an aesthetic and recreational resource for residents along the western boundary of the city. The policy states that growth should be managed in such a way to ensure that significant open-space areas will be preserved (Roseville 2004b). Under Roseville's interpretation, the placement of a new

transmission line located immediately adjacent and parallel to the City of Roseville's western boundary conflicts with their visual quality policy. No other visual resources plans or policies are known within the study area.

Replacing lattice towers in Segment 3 for all alternatives with monopole design may benefit the landscape, but would cause no apparent visual change and would not be noticeable to the typical viewer.

4.15.2.4 Impacts from the No Action Alternative

Under the No Action Alternative, no new impacts would occur to visual resources. During periodic maintenance and operation of Western facilities and ROW, workers and their equipment could draw some visual attention for a short time. However, these impacts would not be significant.

4.15.2.5 Cumulative Impacts

The area contains some water features in a primarily flat, low-lying valley with panoramic views to foothills and distant mountain ranges. Originally, the area supported agricultural uses and has transitioned to rural residential and urban developments over the past several decades, which have impacted the viewshed to a moderate-to-low visual quality. Current and future land development will continue to diminish the visual quality of the area. Transmission lines would contribute to cumulative impacts of the visual quality, these impacts will coincide with current and future urban and rural development. Therefore, the proposed Project would have a less-than-significant cumulative impact to visual resources for Alternatives A and B. Alternative C would have a significant indirect impact on visual resources because Roseville has determined it would violate their visual quality policy. Likewise, this would result in significant cumulative effects.

4.15.2.6 Summary of Impacts

While differences to visual resources exist among the alternatives, Western would comply with EPMs and avoid sensitive visual resource areas. Therefore, Alternatives A and B would not result in significant direct, indirect, or cumulative impacts. However, Alternative C, Segment $2C_2$ would conflict with the City of Roseville's visual resource policy and result in significant indirect and cumulative impacts.

4.16 WATER RESOURCES

4.16.1 Affected Environment

Water resources and hydrology include surface and groundwater resources in the study area. These resources provide drinking water and agricultural irrigation water, as well as habitat for fish and wildlife species. This section characterizes the water and hydrological resources in the study area and assesses the potential impacts of the proposed Project.

Activities affecting water resources identified as "waters of the United States" would fall under the Clean Water Act (CWA) (33 U.S.C. §1251-1387), Section 404 (31 U.S.C. §1344) permitting requirements, Section 402 (33 U.S.C. §1342) NPDES, 401 Certification (33 U.S.C. §1341), and Section 10 Rivers and Harbors Act (33 U.S.C. §403) permitting requirements. Jurisdictional entities include the Central Region of the Department of Water Resources (DWR), the RWQCB, and the Sacramento District of the USACE.

Under Section 404 of CWA, USACE regulates all waters of the United States within their jurisdiction. Waters of the United States include: navigable waters, interstate waters, and all other waters where the use, degradation, or destruction thereof could affect interstate or foreign commerce; and all waters and related tributaries, interstate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. Pursuant to Section 404 of the CWA, USACE regulates and issues permits for such activities. Waters of the United States that have special ecological value are considered to be "special aquatic sites." These sites include wetlands, mudflats, vegetated shallows, coral reefs, riffle and pool complexes, and sanctuaries and refuges. Special aquatic sites are defined by the EPA and may be afforded additional consideration in the permit process for a project.

Section 404 of the CWA also requires a Section 401 water quality certification for jurisdictional waters of the United States. RWQCB is the regulatory agency responsible for this certification and compliance with Section 401.

The CWA Section 402 prohibits discharge of pollutants into waters of the United States from any point source unless the discharge is in compliance with an NPDES permit. The Central Valley RWQCB administers these permits with the State Water

Resources Control Board (SWRCB) and EPA Region 9 oversight. Construction activities that disturb one or more acre are required to comply with the NPDES General Permit and Waste Discharge Requirements for discharges of storm water associated with construction activity (SWRCB issued Order No. 99 08 DWQ). This permit requires the minimization or elimination of storm water discharges from the site; and monitoring measures that control construction materials and wastes, erosion, and sedimentation. In accordance to provisions of the General Permit, construction activities must follow a SWPPP and associated Monitoring and Reporting Plan.

California's Safe Drinking Water Act requires the Department of Health Services to regulate drinking water, and the Porter-Cologne Water Quality Control Act regulates water quality and beneficial uses of state waters.

4.16.1.1 Resource Study Area

Constructing and maintaining the transmission line and associated access roads could impact water resources. Potential impacts would be limited to the ROW for the transmission line, pulling and tensioning sites, material storage yards, and access roads. While some limited potential impacts could occur beyond the ROW boundaries (for example, in the case of a spill into a creek or ditch), it is impossible to define the boundaries for such potentialities. Therefore, this analysis considers the area within the ROW to be the affected environment, as physical impacts to water resources should be limited to those areas.

4.16.1.2 Issues of Environmental Concern

Issues of environmental concern for water resources include erosion, compaction; sedimentation from construction disturbance; blocked drainage; introduction of construction debris or other fill into surface waters; spills of petrochemicals or other contaminants that could reach surface water or groundwater; impacts from excavating structure foundations; damage to irrigation improvements; and depleted water resources. These issues are somewhat heightened for the proposed Project because of the large number of ditches, canals, rivers, and creeks and the proximity of the water table to the land surface.

4.16.1.3 Characterization

The proposed Project is in the northern portion of California's Central Valley and within the Sacramento River Hydrologic Region. The region drains 27,246 square miles from the northern California border to the Sacramento–San Joaquin Delta and from the Sierra Nevada in the east to the Coast Ranges in the west (DWR 2005). Surface water drains toward the study area, from which the region drains generally south-southwest, converging into the Sacramento-San Joaquin Delta and ultimately, the Pacific Ocean by way of San Francisco Bay.

Beneficial uses in the Sacramento River watershed are adversely impacted by the pressure of pollution and sediments entering the watershed from a variety of sources. Impacts to fisheries and drinking water supply can be caused by turbidity, rice pesticides, and organophosphate pesticides, such as diazinon. Water quality problems, such as unsuitable water temperature, toxic heavy metals (mercury, copper, zinc, and cadmium) from acid mine drainage, and agricultural runoff containing pesticides and herbicides, have contributed to the decline in fisheries in the Sacramento River. Rice herbicide contamination in downstream water has been reduced by holding drainage until the herbicide has degraded (DWR 2005).

Irrigated agriculture on the flat valley floor in the study area has led surface water resources to be heavily developed. Throughout the Central Valley, agricultural crops are irrigated by extensive networks of irrigation ditches and canals, improved natural creeks, ponds, lakes, and other irrigation systems. The Bureau of Reclamation and USACE manage some of the irrigation ditches and canals. Others are managed by irrigation districts listed below:

- Sutter Butte Mutual Water Company
- South Sutter Water District
- Sutter Extension Water District
- Natomas Central Municipal Water District
- Rio Linda Water District
- City of Sacramento Water Service Area
- Sacramento County Water District

Groundwater in the Sacramento Valley is the principle water source for urban and domestic uses. Groundwater quality is generally good; however, groundwater along the Sacramento River from the Sacramento International Airport northward to the Bear River has high levels of arsenic, bicarbonate, chloride, manganese, and sodium, as well as total dissolved solids (DWR 2004).

In general, the study area can be divided into three main categories: urban, mixed agriculture and newer residential development, and agriculture. Much of the agricultural area is irrigated. A given field may be irrigated or not in any particular year, depending on the crop. The proposed Project area has abundant surface water in ponds, wetlands, sloughs, creeks, irrigation canals and drainages, and flooded fields. The water table is near the ground surface throughout the study area, which is essentially a large floodplain.

Table 4.16-1 lists all water bodies crossed by Segments 1, 2A1, 2A2, 2A3, 2A4, 2A5, 2B, 2C, and 3. The following paragraphs describe the water resources by segment from the northern end of the study area to the southern end. Only canals wider than 30 feet are specifically mentioned because of the numerous agricultural irrigation ditches and canals. Figures 3.1-4 to 3.1-12 present segment locations and approximate milepost information.

Segment 1

Segment 1 leaves O'Banion Substation and trends generally southeast along the northeast dike of the Sutter Bypass, a 0.7- to 1-mile-wide floodwater bypass from the Sacramento River that floods about once a year (see Map C-1 to -3 in Appendix C). Segment 1 is 17.1 miles long and primarily passes through flat, flood-irrigated cropland, including rice paddies. The segment spans or is near irrigation canals, drainage ditches, creeks, wetlands, and marshes and crosses unnamed canals at MPs 0.5, 0.7, and 8.0. The segment passes through Gilsizer Slough, a designated Fish and Game Code significant natural wetland, that is approximately 0.5 mile wide within the existing ROW (wetlands are further described in Section 4.17) between MPs 1.3 and 1.8 (see Map C-1 in Appendix C). The route diverges from the Sutter Bypass at MP 9.0 and crosses some orchards and interspersed grassland. The segment crosses Nelson Slough and associated Feather River at MP 11.0 and Coon Creek at MP 13.2 (see Map C-4 in Appendix C). Segment 1 continues through agricultural fields, crosses Bunkham Slough at MP 15.6, and ends just north of Cross Canal (see Map C-5 in Appendix C).

Segment 2

Segment 2 alternatives begin on the north side of Cross Canal, about 8.5 miles north of the Elverta Substation (see Map C-5 in Appendix C). Cross Canal is a tributary of the Sacramento River that connects the river to Pleasant Grove Creek Canal and provides water to rice fields. The Segment 2 area, like that to the north, is very flat and drained by various creeks, sloughs, and ditches. The area mainly consists of rice fields, with some pastureland and cropland, and an extensive network of irrigation ditches. Surface water is abundant in this area with associated creeks, canals, ditches, and areas of vernal pools and seasonal wetlands.

Segments 2A1 through 2A5 proceed 0.7 mile along Cross Canal, then turn south and span Cross Canal. The segments proceed south along Highway 99 along an east or west route option, traversing and paralleling many small irrigation ditches and unnamed canals at MP 1.9, 3.0, 5.3, until reaching one of five routes between Riego Road and Elkhorn Boulevard. The southern portions of Segments 2A1, 2A2, and 2A5 pass through agricultural fields parallel to the Natomas East Main Drainage Canal (see Map C-9 in Appendix C). Segments 2A1, 2A2, and 2A4 cross additional unnamed canals, as shown in Table 4.9-2.

Segment 2B traverses Cross Canal, and then continues southeast parallel to Pleasant Grove Creek on the east (see Map C-5 in Appendix C). The segment crosses an unnamed canal at MP 1.1, Pleasant Grove Creek at MP 2.6, Curry Creek at MP 3.1, and a perennial creek at MP 5.2 (see Maps C-6, -8, and -9 in Appendix C). The segment crosses a perennial creek at MP 8.2 and an intermittent creek at MP 8.6.

Segment $2C_1$ traverses Cross Canal (see Map C-5 in Appendix C), then trends southeast, crossing an unnamed canal at MP 1.5, Pleasant Grove Creek at MP 2.5, and Curry Creek at MP 3.9 (see Map C-8 in Appendix C). Seasonal wetlands, vernal pools, swales, marsh, and creeks are located between MPs 4.4 and 9.2 (see Maps C-8 and -9 in Appendix C).

Segment $2C_2$ crosses about 0.2 mile of vernal pool habitat (see Map C-11 in Appendix C), then crosses Curry Creek at MP 5.0, an intermittent stream at MP 5.7, and an intermittent creek, seasonal wetlands, and vernal pools between MPs 3.9 and 6.2 (see Map C-12 in Appendix C).

Segment 3

Surface water remains abundant within Segment 3, with the route crossing several wetland swales, seasonal wetlands, canals, and ditches—many of which drain into the Natomas East Drainage Canal. Segment 3 crosses this canal less than 1 mile south

Table 4.16-1. Water Crossings

Segment	Mile-post	Water Body	CA Quad[a]	County	Width (feet)[b]	Direction[c]
1	0.5	Canal	Gilsizer Slough	Sutter	40	NW to SE
1	0.7	Canal	Gilsizer Slough	Sutter	40	NW to SE
1	1.3	Gilsizer Slough	Gilsizer Slough	Sutter	2826	NW to SE
1	8.0	Canal	Sutter Causeway	Sutter	50	NW to SE
1	11.0	Nelson Slough	Nicolaus	Sutter	149	NW to SE
1	11.5	Feather River	Nicolaus	Sutter	593	NW to SE
1	13.2	Coon Creek	Verona	Sutter	74	NW to SE
1	15.6	Bunkham Slough	Verona	Sutter	30	NW to SE
2A1	0.7	Cross Canal	Verona	Sutter	223	N to S
2A1	1.9	Canal	Verona	Sutter	36	N to S
2A1	6.3	Canal	Verona	Sutter	40	W to E
2A2	0.7	Cross Canal	Verona	Sutter	223	N to S
2A2	1.9	Canal	Verona	Sutter	36	N to S
2A2	7.8	Canal	Taylor Monument	Sutter	52	W to E
2A2	8.2	Canal	Taylor Monument	Sutter	35	W to E
2A3	0.7	Cross Canal	Verona	Sutter	223	N to S
2A3	1.9	Canal	Verona	Sutter	36	N to S
2A4	0.7	Cross Canal	Verona	Sutter	223	N to S
2A4	1.9	Canal	Verona	Sutter	36	N to S
2A4	8.4	Canal	Taylor Monument	Sacramento	40	N to S
2A4	9.7	Canal	Taylor Monument	Sacramento	35	N to S
2A4	12.3	Canal	Taylor Monument	Sacramento	75	W to E
2A4	12.9	Canal	Taylor Monument	Sacramento	30	W to E
2A5	0.7	Cross Canal	Verona	Sutter	223	N to S
2A5	1.9	Canal	Verona	Sutter	36	N to S
2B	0.1	Cross Canal Floodway	Verona	Sutter	157	NW to SE
2B	1.1	Canal	Verona	Sutter	60	NW to SE
2B	2.6	Pleasant Grove Creek	Verona	Sutter	95	NW to SE
2B	3.1	Curry Creek	Verona	Sutter	90	NW to SE
2B	5.2	Perennial Creek	Pleasant Grove	Sutter	34	NW to SE
2B	8.2	Perennial Creek	Pleasant Grove	Sacramento	21	NE to SW
2B	8.6	Intermittent Creek	Pleasant Grove	Sacramento	8	NE to SW
2C1	0.1	Cross Canal Floodway	Verona	Sutter	157	NW to SE
2C1	1.5	Canal	Verona	Sutter	50	NW to SE
2C1	2.5	Pleasant Grove Creek	Pleasant Grove	Sutter	80	NW to SE
2C1	3.9	Curry Creek	Pleasant Grove	Sutter	21	NW to SE
2C1	5.9	Perennial Creek	Pleasant Grove	Sutter	45	N to S
2C1	8.7	Perennial Creek	Pleasant Grove	Sacramento	15	NE to SW
2C1	9.1	Intermittent Creek	Pleasant Grove	Sacramento	16	NE to SW
2C2	5.0	Curry Creek	Pleasant Grove	Placer	15	N to S
2C2	5.7	Intermittent Creek	Pleasant Grove	Placer	15	N to S
3	0.8	Natomas East Main Drainage Canal	Rio Linda	Sacramento	60	W to E
3	1.5	Canal	Rio Linda	Sacramento	70	N to S

Source: Burleson 2007

[a] United States Geological Survey California topographical quadrangle sheet title

[b] Approximate width along transect, as measured from topographic maps

[c] North-N, South-S, East-E, West-W, Northeast-NE, Northwest-NW, Southeast-SE, and Southwest-SW

of the Elverta Substation. The segment also crosses an unnamed canal at MP 1.5 (see Map C-10 in Appendix C).

4.16.2 Environmental Consequences

4.16.2.1 Standards of Significance

A significant effect to water resources would occur under the following conditions:

- Contamination of surface water from erosion or storm water runoff that would result in a violation of Federal and/or state water quality standards or permits;
- Depletion of groundwater resources or interference with groundwater recharge; or
- Increased long-term susceptibility to on- or off-site flooding, erosion, or siltation, resulting from altered surface hydrology.

4.16.2.2 Environmental Protection Measures

EPMs for water resources from Table 3-3 include the following:

25. Western would span the Feather River and Cross Canal riparian corridor and no construction or maintenance equipment would cross these water bodies. Sedimentation control structures would be used to prevent sediment from reaching riverine habitat.

26. Hazardous materials would not be drained onto the ground or into streams or drainage areas. All construction and maintenance waste would be removed daily. This would include trash and litter, garbage, other solid waste, petroleum products, and other regulated materials. The materials would be sent to a disposal facility authorized to accept such materials.

59. Direct impact to irrigation system and drainage canal features that are eligible for the NRHP, would be avoided during the siting of new transmission line structures and access roads, and most other irrigation system features would be avoided to the extent practicable in siting new structures and access roads.

62. Surface restoration would occur in construction areas, material storage yards, structure sites, spur roads, and existing access roads where ground disturbance occurs or where recontouring is required.

63. Access roads would be built at right angles to the streams and washes to the extent practicable. Culverts would be installed where needed. All construction and maintenance activities would be conducted to minimize disturbance to vegetation and drainage channels.

64. Excavated material or other construction materials would not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters.

65. Non-biodegradable debris would be collected and removed from the ROW daily and taken to a disposal facility. Slash and other biodegradable debris would be left in place or disposed of.

66. All soil excavated for structure foundations would be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations. Excess soil would be removed from the site and disposed of appropriately. Areas around structure footings would be reseeded with native plants.

67. Wherever possible, new structures and access roads would be sited out of floodplains. Due to the abundance of floodplains and surface water resources in the study area, complete avoidance may not be possible and Western would consult with USACE.

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

92. When feasible, all construction activities would be rerouted around wet areas while ensuring that the route does not cross sensitive resource areas.

93. Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses would be conducted to prevent muddy water and eroded materials from entering the streams or watercourses with construction of interceptors.

98. Permits, agreements, and certificates for construction in jurisdictional waters or

wetlands would be obtained from the USACE, CDFG, and RWQCB, as needed.

99. Culverts would be installed where needed to avoid surface water impacts during construction of transmission line structures. All construction activities would be conducted in a manner to avoid impacts to water flow.

100. Runoff from the construction site would be controlled and meet RWQCB storm water requirements and the conditions of a construction storm water discharge permit. A storm water pollution prevention plan would be prepared and implemented.

4.16.2.3 Impacts from Alternatives

Transmission lines normally span water bodies because of the increased difficulty of access and expense of construction in these areas and because structures are typically sited on higher ground to increase span lengths and improve conductor ground clearance. Typical span lengths without special structures are about 1,100 feet. Adjusting span length would allow avoidance of most water bodies.

In terms of water resource sensitivity, the entire study area has abundant surface water that could be impacted. Because of the vast amount of surface water in the study area, some impact to water resources is unavoidable; but erosion potential is small, given the lack of terrain relief, low stream and river gradients, and rapid revegetation conditions. Construction within Gilsizer Slough, and the Feather River and Cross Canal riparian corridors could result in increased erosion and sedimentation, which may adversely affect water quality. Western would span these water bodies and no construction equipment would cross via the water bodies when water is present. Water quality impacts during construction, such as increased water turbidity, release of petroleum hydrocarbons caused by a fuel spill, and erosion of stream banks, would be prevented by complying with the EPMs and the SWPPP.

During construction in the proposed Project area, Western would prevent contamination of surface water from erosion or storm water runoff that would result in a violation of applicable Federal and state water quality standards. Western would obtain permits to comply with applicable environmental laws and regulations.

Transmission line structures may increase the area of impermeable surfaces along the ROW by a maximum of 1.8 acres long term. An area this small would not measurably reduce groundwater recharge. Construction and maintenance activities are not expected to cause a depletion of groundwater resources or interfere with groundwater recharge.

Western would prevent increased long-term susceptibility to on- or off-site flooding, erosion, or siltation, caused by altered surface hydrology by performing surface restoration in construction and maintenance areas where ground disturbance is substantial or where recontouring is required. Western would not stockpile excavated material or other construction materials or deposit them near or on stream banks, lake shorelines, or other watercourse perimeters. Western would use sedimentation control measures to prevent erosion and sedimentation. Western would avoid or reduce significant impacts during construction and maintenance of the transmission line for each segment by complying with EPMs.

When construction is completed, no water quality impacts would be associated with the long-term operation of the transmission lines. Using EPMs, the transmission lines would not substantially degrade water quality, contaminate a public water supply, degrade or deplete groundwater resources, interfere with groundwater recharge, or cause any substantial flooding, erosion, or siltation.

Western did not determine Section 404 jurisdictional status of water resources encountered. When the Preferred Alternative is selected, any impacted waters of the United States would be evaluated for jurisdictional status during consultation with the USACE. Activities that require a USACE permit under Section 404 include placing fill or riprap, grading, mechanized land clearing, and dredging.

4.16.2.4 Impacts from the No Action Alternative

Under the No Action Alternative, Western would operate and maintain the existing transmission system between O'Banion and Natomas substations as it does presently. Western would periodically access the line for routine maintenance or emergency repairs along the existing ROW and access roads. Depending upon the location and the season, temporary and less-than-significant impacts to water resources could occur because of vehicle access for maintenance purposes. Routine vegetation

management activities also could cause temporary less-than-significant impacts by removing ground cover and soil compaction, which may increase the potential for erosion and sedimentation. Very low risks of physical damage to irrigation improvements or fuel spills would exist during fieldwork. Any damage would promptly be repaired or spills cleaned up under Western's policies and applicable environmental law, regulations, and permits.

4.16.2.5 Cumulative Impacts

The proposed Project area traverses and parallels several Sacramento River tributaries, creeks, irrigation canals, and ditches. Past and present activities in the proposed Project area, including agriculture and mining, have contributed to decreased water quality from turbidity, toxic heavy metals (mercury, copper, zinc, and cadmium), pesticides, and herbicides (DWR 2005). The Project area overlies the North American subbasin which lies in the eastern central portion of the Sacramento Groundwater Basin. Groundwater quality in the North American subbasin has been generally good; however, groundwater along the Sacramento River from the Sacramento International Airport northward to the Bear River contains high levels of arsenic, bicarbonate, chloride, manganese, sodium, and total dissolved solids (DWR 2004).

Foreseeable future projects in the study area include commercial and residential developments that would result in a substantial conversion of agricultural land to urban uses (SACOG 2005a). Growth and development in the Sacramento area would increase water demand. DWR (2005) has acknowledged the water use challenges that urban development would cause, including a lack of adequate drought-period water supplies and growth in floodplains. This could result in cumulative impacts to hydrology and water quality. Federal, state, and local regulations would require that projects avoid water resources and implement measures to protect, and in some cases improve water resources. These efforts and measures would reduce impacts to less than significant.

4.16.2.6 Summary of Impacts

While minor differences to water resource impacts exist among each alternative, Western would comply with EPMs, applicable environmental laws, regulations, and permits. Therefore, the alternatives would not result in significant direct, indirect, or cumulative impacts.

4.17 WETLANDS

4.17.1 Affected Environment

This section describes existing wetland conditions within the study area and how the project segments and alternatives would affect these resources. Wetlands are defined as those areas that are covered or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (USACE 1987). Wetlands are delineated based on prevalent vegetation that consists of macrophytes (large plants) that, due to morphological, physiological, and reproductive adaptation(s), have the ability to grow, effectively compete, reproduce, and persist in anaerobic (without oxygen) soil conditions; presence of soils that have been classified as hydric (wet), or they possess characteristics that are associated with reducing soil conditions; and hydrology that is covered either permanently or periodically at mean water depths less than or equal to 6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation (USACE 1987).

Wetlands provide natural flood protection and erosion control, recharge surface and groundwater, and maintain and improve local water quality. They are among the most productive and biologically diverse ecosystems in the world, providing dynamic specialized habitat for a wide variety of common and rare plant and animal species. Environmental regulations have been developed to preserve and protect the unique habitat types and species they support. Figures 4.17-1 and 4.17-2 and Table 4.17-1 present the wetlands within the study area.

Activities affecting wetlands are regulated under Section 404 of the CWA (33 U.S.C. §1344) and Executive Order (EO) 11990, Protection of Wetlands (42 FR 26961). Areas that meet wetland criteria, established by USACE, are subject to the regulatory jurisdiction of USACE, pursuant to Section 404 of the CWA (see Section 4.16). DOE policy and procedures in 10 CFR 1022 ensure that DOE activities in wetlands comply with the EO requirements. This SEIS and EIR contains information on avoiding activities impacting wetlands to comply with 10 CFR 1022.

Table 4.17-1 Wetland Types

Wetland Type	Description
Freshwater emergent	Characterized by erect, rooted, herbaceous, hydrophytic vegetation (for example, sedges, rushes, curly dock, cattail, bulrush, arrowhead); frequently flooded or saturated soils
Riverine	Freshwater emergent wetland located within a watercourse channel that lacks trees and shrubs, persistent emergents, mosses, and lichens
Lacustrine	Freshwater emergent wetlands associated with deepwater habitats (depressions or dammed river channels) that lack trees and shrubs, persistent emergents, mosses, and lichens
Palustrine	Freshwater emergent wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, separate from or associated with riverine or lacustrine wetlands
Vernal Pool	Seasonal, perched fresh water wetlands and swales of varying size found in a larger mosaic of grassland, oak woodland or riparian woodland, including plant species like wild oats, ripgut brome, annual ryegrass, and foxtail

Source: Modified from Cowardin *et al.*, 1979

4.17.1.1 Resource Study Area

The study area for wetland resources is the transmission line corridor along the proposed ROW segments. This includes ROW intersections with portions of the Feather River and smaller tributaries and floodplains. Wetland resources may be impacted by new construction, structure replacement, new and existing access roads, and temporary work sites (pulling, tensioning, and staging areas).

4.17.1.2 Issues of Environmental Concern

Project activities may destroy or degrade the biological (species diversity and habitat) values of wetlands and interfere with or eliminate their beneficial functions in the ecosystem. These impacts may occur because of excavation or filling, disturbance of hydrologic patterns, increased erosion and sedimentation from disturbed area runoff, and increased access and exploitation by humans and invasive plant species. Wetlands associated with the abundant surface water in the study area provide natural flood protection and erosion control, recharge surface and groundwater, and maintain and improve local water quality.

4.17.1.3 Characterization

Wetland resources within the study area were determined from a review of the USFWS National Wetlands Inventory (USFWS 1990), USDA Soil Conservation Service Local Identification Maps, USGS topographic maps of the study area, and various state of California wetland inventories. Western conducted field surveys of wetland resources in portions of the study area between December 2005 and July 2006. Table 4.17-1 lists field determinations based on vegetative and hydrologic features and classified according to Cowardin *et al.* (1979).

The field survey recorded all wetland and floodplain habitats observed along the study area. This section presents the results. Figures 4.17-1 and 4.17-2 show where various segments intersect and could impact wetland habitats. The existence and extent of vernal pool habitat was not always definitive because of seasonal water conditions and access limitations. Table 4.17-2 identifies the length (in miles) and the number of acres of wetlands for each segment.

Western did not determine Section 404 jurisdictional status of wetlands encountered. Once Western selects a preferred alternative, any impacted wetlands would be evaluated for jurisdictional status during consultation with USACE.

Segment 1

Segment 1 intersects lacustrine and palustrine freshwater emergent (a plant that is rooted below the water but has foliage that extends above the water level) wetlands associated with Gilsizer Slough at MP 1.3 to 1.8. Wetland vegetation consists of willow, bullrush, cattail, sedge, arrowhead, and water hyacinth. The alignment crosses the levee setback zones and the Feather River with associated valley-foothill riparian (habitat or areas, usually adjacent to rivers, streams, or lakes, where the vegetation and microclimate are heavily influenced by water) habitat between MP 11.0 and 11.5. The riparian vegetation is generally composed of

Table 4.17-2 Summary of Wetlands

Segment	Wetland (miles crossed)	Wetland (acres within ROW)
1	0.5	8.0
2A1	0.05	0.8
2A2	0.05	0.8
2A3	0.4	6.0
2A4	0.01	0.2
2A5	0.03	0.5
2B	1.3	19.3
2C	0.8	11.3
3	0.2	3.3

Source: Burleson 2006

Note: Wetland miles crossed and acres within the ROW were calculated using Arc GIS Software and aerial maps. Wetland locations were determined during biological surveys and were digitized using Arc GIS. Miles crossed was calculated by starting at the edge of the wetland and following the transmission line to the ending edge of the wetland. Acres of wetlands crossed were calculated by summing the area (acres) of wetland within each segment ROW.

cottonwood *(Populus* sp.*)*, boxelder (*Sambucus* sp.), willow (*Salix* sp.*)*, blackberry (*Rubus* sp.*)*, coyote thistle (*Eryngium vaseyi*), popcorn flower (*Plagiobothrys stipitatus)*, hedge-hyssop *(Gratiola ebracteata)*, dwarf wooly-heads *(Psilocarphus brevissimus* var. *brevissimus)*, round wooly marbles *(Psilocarphus tenellus)*, toad rush *(Juncus bufonius)*, downingia *(Downingia bicornuta)*, and *goldfields (Lasthenia* sp.). The setback zones show evidence of prior agricultural disturbance. Existing Structure 146-4 is within this area, but well away from the valley-foothill riparian vegetation. At MP 13.2, the segment crosses valley-foothill riparian habitat (cottonwood and willow), including a small riverine wetland associated with Coon Creek. The existing transmission structures span the creek and riparian area. Segment 1 crosses Bunkham Slough at MP 15.6.

Segment 2A

Segment 2A traverses Cross Canal and associated Great Valley Forest habitat, open water, and Great Valley Scrub habitat. The wetland vegetation is generally composed of cottonwood (*Populus* sp.), willow (*Salix* sp.), blackberry (*Rubus* sp.), coyote thistle (*Eryngium vaseyi*), popcorn flower (*Plagiobothrys stipitatus)*, hedge-hyssop *(Gratiola ebracteata)*, dwarf wooly-heads *(Psilocarphus brevissimus* var. *brevissimus)*, round wooly marbles *(Psilocarphus tenellus)*, toad rush *(Juncus bufonius)*, downingia *(Downingia bicornuta)*, and goldfields *(Lasthenia* sp.).

Segment 2A1 crosses one isolated seasonal wetland at MP 10.0.

Segments 2A1, 2A2, and 2A5 cross eight isolated seasonal wetlands between about MP 11.0 and the end.

Segment 2A2 crosses a seasonal wetland at MP 9.9.

Segment 2A3 crosses 6.0 acres of seasonal wetland and vernal pool habitats between MP 11.1 and 11.9.

Segment 2A4 crosses three small (less than 200 feet), isolated seasonal wetlands near the end.

Segment 2B

Segment 2B intersects valley-foothill riparian habitat and freshwater marsh associated with Cross Canal between MP 0.0 and 0.3. The freshwater marsh is a floodway for Cross Canal and becomes submerged following heavy rainfall. Wetland vegetation consists of cottonwood, willows, blackberry, and some cattails surrounding small areas of annual grassland. The segment continues southeast, parallel to the Pleasant Grove Creek Canal, and crosses freshwater marsh at MP 0.6 and less than 200 feet of freshwater marsh at MP 0.8. The segment crosses an unnamed canal and associated freshwater marsh at MP 1.1, Pleasant Grove Creek at MP 2.6, and Curry Creek at MP 3.1, which are gene rally composed of willow and blackberry, and some seasonal wetlands

between MP 3.4 and 3.8. The segment then intersects vernal pool habitat, with some palustrine wetlands (cattails and bulrush) between MP 4.0 and 6.2, and a perennial creek with associated freshwater marsh at MP 5.2. The segment traverses another length of vernal pool habitat, freshwater emergent wetlands, and two intermittent creeks in non-native grasslands between MP 6.8 and 9.2.

Segment 2C

Segment $2C_1$ intersects valley-foothill riparian wetland and freshwater marsh associated with Cross Canal between MP 0.0 and 0.3. Wetland vegetation consists of cotton wood, willows, blackberry, and some cattails surrounding small areas of annual grassland. The segment crosses an unnamed canal with associated freshwater marsh at MP 1.5, then crosses some seasonal wet lands and freshwater emergent wetlands between MP 2.0 and 2.3. The segment crosses Pleasant Grove Creek at MP 2.3, surrounded by a rice field with intermixed cattails. Segment $2C_1$ spans an isolated seasonal wetland at MP 3.8 and Curry Creek, with associated valley-foothill riparian habitat at MP 3.9. The segment crosses some seasonal wetlands and vernal pools between MP 4.4 and 4.8 and a freshwater marsh at MP 4.9. Segment $2C_1$ crosses primarily non-native grasslands south of Riego Road with dense areas of vernal pools, seasonal wetlands, wetland swales, and two intermittent creeks between MP 7.4 and 9.2.

Segment $2C_2$ originates at Structure 143/3 and proceeds east through vernal pool habitat. The segment crosses a vernal pool at MP 1.5 and an isolated seasonal wetland at MP 1.9, then turns south at MP 3.9 and crosses over dense areas of vernal pools, seasonal wetlands, and wetland swales between MP 3.9 and 6.2. The transmission line parallels the western edge of the WRSP Open Space Preserve between MP 3.9 and 4.9. This preserve consists of several habitat types, including non-native grasslands, vernal pools, and riparian/oak woodland corridors. The segment intersects Curry Creek at MP 5.0 and an intermittent creek at MP 5.7. Vernal pools are present at the segment end.

Segment 3

Segment 3 intersects seasonal wetlands with some freshwater marsh (cattails and bulrush) between MP 0.2 and 1.0. The segment crosses over the Natomas East Main Drainage Canal and associated wetlands at MP 0.8. Existing Structure 0-3 is located on a channel margin in this area. Segment 3 intersects vernal pool habitat between MP 1.3 to 1.4 and MP 1.9 to 2.1.

4.17.2 Environmental Consequences

4.17.2.1 Standards of Significance

A significant effect to wetlands would occur under the following conditions:

- Drainage, dewatering, or discharge of fill material into jurisdictional wetlands under Section 404 of the CWA or in violation of a Section 404 permit;
- Increased access to wetland sites, resulting in degradation of the resource; or
- Erosion and sedimentation of soils or changes in topography that would violate water quality standards for discharge to a wetland habitat.

4.17.2.2 Environmental Protection Measures

EPMs for wetland resources from Table 3-3 include the following:

18. A qualified biologist would conduct a site survey before clearing vegetation in sensitive habitats. The purpose of this survey would be to identify any biologically sensitive issues such as wetlands, vernal pools, or habitat of concern. Western would avoid these areas to the extent practical.

22. Freshwater emergent, lacustrine, and riverine wetlands would be spanned and vehicular traffic would be prohibited within 100 feet of the high-water boundary of these wetlands.

23. To the extent practical, when water is present, vernal pools would be driven around, spanned, or otherwise avoided.

26. Hazardous materials would not be drained onto the ground or into streams or drainage areas. All construction and maintenance waste, including trash and litter, garbage, other solid waste, petroleum products, and other regulated materials would be removed daily to a disposal facility authorized to accept such materials.

63. Access roads would be built at right angles to the streams and washes to the extent practicable. Culverts would be installed where needed. All construction and maintenance activities would be conducted

to minimize disturbance to vegetation and drain age channels.

64. Excavated material or other construction materials would not be stockpiled or deposited near or on stream banks, lake shorelines, or other watercourse perimeters.

65. Non-biodegradable debris would be collected and removed from the ROW daily and taken to a disposal facility. Slash and other biodegradable debris would be left in place or disposed of.

66. All soil excavated for structure foundations would be backfilled and tamped around the foundations, and used to provide positive drainage around the structure foundations. Excess soil would be removed from the site and disposed of appropriately. Areas around structure footings would be reseeded with native plants.

67. Wherever possible, new structures and access roads would be sited out of floodplains. Due to the abundance of floodplains and surface water resources in the study area, complete avoidance may not be possible and Western would consult with USACE.

91. Construction vehicle movement outside of the ROW normally would be restricted to approved access or public roads.

92. Where feasible, all construction activities would be routed around wet areas while ensuring that the route does not cross sensitive resource areas.

93. Dewatering work for structure foundations or earthwork operations adjacent to, or encroaching on, streams or watercourses would be conducted to prevent muddy water and eroded materials from entering the streams or watercourses.

98. Applicable permits, agreements, and certificates for construction in jurisdictional waters or wetlands would be obtained, e.g. from the USACE or RWQCB, as needed.

99. Culverts would be installed where needed to avoid surface water impacts during construction of transmission line structures. All construction activities would be conducted in a manner to avoid impacts to water flow.

100. Runoff from the construction site would be controlled and meet RWQCB storm water requirements and the conditions of a construction storm water discharge permit. A storm water pollution prevention plan would be prepared and implemented.

101. In areas where ground disturbance is substantial or where recontouring is required, vegetation restoration would occur.

4.17.2.3 Impacts from Alternatives

Table 4.17-3 presents the number of structures that could be sited in wetlands for each alternative with associated short- and long-term impacts.

Table 4.17-3 Summary of Wetland Impacts by Alternative

Alternative	Structures Within Wetlands	Short-Term Acres Impact	Long-Term Acres Impact
A1	4	0.9	0.04
A2	4	0.9	0.04
A3	6	1.4	0.06
A4	4	0.9	0.04
A5	4	0.9	0.04
B	10	2.3	0.1
C	7	1.6	0.07
No Action	0	0.0	0.0

Source: Burleson 2007

Note: Impacts were calculated by assuming disturbance caused by structures sited in wetlands of 0.23 short-term acre and 0.01 long-term acre for each structure. Impacts do not include material storage yards, pulling sites, or access roads, because it was assumed that these could be sited away from sensitive areas.

Four structures may be sited in wetlands for Alternatives A1, A2, A4, and A5 within Segments 1 and 3. Segment 1 may have two structures sited in Gilsizer Slough (MP 1.5 and 1.8). Construction of these two structures would be a short-term disturbance to approximately 0.5 acre of wetlands and 0.02 acre long term. Segment 3 may have two structures sited within vernal pools and would impact 0.5 acre short term and 0.02 acre long term. Access road disturbance was determined using the assumptions listed in Appendix B. If access roads could not avoid wetlands, Alternative A4 would impact 1.0 acres and Alternatives A1, A2, and A5 would impact up to 1.1 acres long term.

Alternative A3 may have two structures sited in wetland habitat in addition to the structures sited in wetlands for Segments 1 and 3. This would result in short-term disturbance of approximately 1.4 acres and long-term disturbance of approximately 0.06 acre. If access roads could not avoid wetlands, Alternative A3 would impact up to 1.8 acres long term.

Alternative B may have two structures sited within the freshwater marsh associated with Cross Canal between MP 0.0 and 0.3, and four structures sited within wetlands in addition to the structures sited within wetlands for Segments 1 and 3. Construction of these ten structures would impact up to 2.3 acres of wetlands short term and 0.1 acre long term. If access roads could not avoid wetlands, Alternative B would impact up to 3.4 acres long term.

Alternative C may have three structures sited within freshwater marsh or wetlands in addition to the structures sited within wetlands for Segments 1 and 3, and would impact up to 1.6 acres of wetland short term and 0.07 acre long term. If access roads could not avoid wetlands, Alternative C would impact up to 1.6 acres long term. Alternative C would parallel the western edge of the WRSP Preserve between MP 3.9 and 4.9; however, the transmission line would be located within agricultural fields next to the preserve and would not directly or indirectly affect vernal pools within the preserve.

Filling of wetlands without mitigating them would be a permanent adverse effect. If siting and design specifications identify that wetland areas cannot be avoided, Western would conduct wetland delineation in consultation with the USACE and USFWS. In addition, a Section 401 RWQCB Certification and Section 404 permit may be required before construction. Western would mitigate impacts to wetlands that cannot be avoided. Construction of structures within wetlands would result in short- and long-term impacts. Short-term impacts during construction may include soil erosion or sedimentation, increased water turbidity, and erosion of stream banks. A fuel spill could be a short-term or long-term impact, depending on material spilled, response time, and quality of the clean up.

Construction of access roads could allow easier human access to wetland areas. Facilities would be located to avoid these areas, so human access into these areas is not expected to increase. Furthermore, all proposed Project activities would comply with any stipulations required by permits.

Western would use sedimentation control measures to prevent erosion and sedimentation of soils that would violate water quality standards for discharge to a wetland habitat. Changes in topography that would violate water quality standards for discharge to a wetland habitat would be avoided by restricting all construction vehicle movement outside of the ROW to approved access or public roads; and whenever possible, vehicular traffic would be prohibited within 100 feet of the high-water boundary of these wetlands. Revegetation of disturbed areas would occur rapidly given favorable regeneration conditions. Rapid revegetation would quickly reduce potential erosion, sedimentation, and invasion by non-native plant species.

Transmission lines normally span wetlands because of the increased difficulty of access and expense of construction in these areas and because structures are typically sited on higher ground to increase span lengths and improve conductor ground clearance. Typical span lengths without special structures are on the order of 1,100 feet. Adjusting span length allows avoidance of most wetlands. Temporary work sites (pulling and material storage) create temporary impacts. Given the flexibility in siting temporary work sites, impacts to wetland habitat would be unlikely. Significant impacts during construction and maintenance of transmission lines would be avoided or reduced by Western and its contractors by complying with the EPMs. Additionally, alternative siting would further reduce impacts to wetlands. Western's project activities would comply with applicable environmental laws, regulations, and permits.

4.17.2.4 Impacts from the No Action Alternative

Without the proposed Project, significant changes to existing facilities or segment would not occur. Existing access roads would continue to be maintained and used under the No Action Alternative. No new impacts to wetlands would be expected. Normal operation, maintenance, repairs, and emergency management of the system would continue as in the past. There are recognized temporary and less-than-significant impacts associated with maintaining access and transmission service.

4.17.2.5 Cumulative Impacts

Past and present land use in the proposed Project area is primarily agricultural. Conversion of wetlands to commercial and residential development is widespread in the Central Valley (SACOG 2005a). Figure 4.9-3 shows planned development that would convert agriculture and undisturbed land to urban use in Sacramento, Sutter, and west Placer Counties. These planned developments would be required to comply with applicable approval requirements, for which local and state authorities would require appropriate avoidance and mitigation measures. No significant cumulative impacts would be anticipated.

4.17.2.6 Summary of Impacts

While minor differences occur among the levels of disturbance for wetlands, Western would consult with the appropriate agencies prior to beginning construction activities. Complying with EPMs and consultation would prevent the alternatives from causing a significant direct, indirect, or cumulative impact. Table 4.17-3 presents impacts to wetlands from each alternative. Alternative B would cross over the most wetlands (29.6 acres) and would have the greatest direct impact (3.4 acres long term). Alternative A4 would cross over the fewest wetlands (11.5 acres) and would have 1.0 acres of long-term impacts.

4.18 PUBLIC SERVICES

The proposed Project would provide short-term construction employment but no permanent employment. A maximum of about 25 daily workers would be on the various job sites during peak construction periods. Project construction would draw the local labor workforce pool from the affected counties. Non-local labor would be employed for specialized skills that may not be available locally. The limited temporary nature of this employment would not result in long-term growth in the area. Table 3-2 provides a breakdown of employment skills for new transmission line construction.

The proposed Project would not tax existing community services or require water, wastewater, or permanent solid waste services. The need for city- and county-provided services, such as road improvements, law enforcement, and fire protection, would be negligible.

4.19 UNAVOIDABLE ADVERSE IMPACTS

Western defines unavoidable adverse impacts as those that could not be reduced to less than significant levels through EPMs (see Table 3-3), other mitigation measures, or utilization of another alternative. Only one alternative, if chosen, would result in unavoidable adverse impact. Alternative 2C would conflict with the City of Roseville's visual resource policy and result in significant indirect and cumulative impacts. Western would, however, work closely with the City of Roseville to implement additional mitigation measures if Alternative 2C is selected.

4.20 SHORT-TERM USES VERSUS LONG-TERM PRODUCTIVITY

This section considers the effects of the Project that narrow the range of beneficial uses of the environment. The Project would result in a long-term commitment of resources along the length of the corridor.

During the 50- to 60-year life of the transmission line, the construction phase for the Project would cause the most ground disturbance, with up to 78 acres of temporary disturbance to the physical environment. Impacts would include up to 497 acres of new ROW, up to 41.5 acres for transmission structure installation, 24.2 acres for access roads, 5.2 acres for pulling sites, and about 10 acres for material storage areas. After construction, Western would reclaim the majority of disturbed areas, including new ROW, pulling sites, material storage areas, and structure sites to preconstruction use. Permanent land dedicated to the facilities, resulting in up to 57.3 acres, would experience long-term disturbance for the transmission line structures and access roads.

Potential adverse effects to air quality would be short-term, mainly localized, and result from construction of the facilities. These short-term impacts would exceed regulatory thresholds for NO_x emissions.

Potential effects to biological resources, including sensitive plant species, sensitive habitats, and wildlife, primarily would be long-term, caused by the permanent removal of vegetation and other wildlife habitat. Habitat recovery in areas of temporary disturbance would vary according to the vegetation type and the presence or absence of special-status rare plant species.

Impacts to cultural resources would last beyond the life of the proposed Project, if cultural resources were disturbed during construction. Similarly, direct physical impacts to Native American sites and paleontological resources are considered to be long-term (permanent) and non-renewable.

Potential land use effects would be long-term in nature because the proposed Project would remove prime and unique farmland and Williamson Act land from agricultural production. Short-term impacts would result from construction noise, dust, and equipment operations. Most of the proposed Project would be located in rural and agricultural areas that are expected to be developed in the future. Current agricultural activities could continue with minor interruption or impact and future development potential would not be precluded. Agricultural practices could continue on most of the ROW, except where structures are proposed. Overall, transmission line corridor productivity would remain similar to existing conditions.

Noise impacts would be short-term during project construction. Visual effects would be both short- and long-term. Long-term additive impacts would result from the presence of the new transmission lines. Visual impacts would be somewhat increased during construction from the presence of equipment and related fugitive dust.

4.21 IRREVERSIBLE/IRRETRIEVABLE COMMITMENT OF RESOURCES

For the proposed Project, some of the resource commitments would be irreversible and irretrievable; that is, the resources would be neither renewable nor recoverable for future use. Resources that would be irreversibly or irretrievably committed by construction and operation of the proposed Project include sensitive habitats, wetlands and other Waters of the United States, and farmland where structures and access roads would be constructed, as well as construction materials that could not be recovered or recycled, and fuel consumed.

Resources used during construction of the proposed Project would include crushed stone, sand, water, diesel fuel, gasoline, and iron ore and coal used to produce steel. None of these resources is in short supply relative to the size and location of the proposed Project.

The proposed Project would require a commitment of human and financial resources that would prevent use of the resources for alternative projects or Federal activities. However, the commitment is consistent with the purpose of and need for the proposed action (see Section 1).

4.22 GROWTH INDUCEMENT

In accordance with CEQA Guidelines, an EIR must "discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment." In addition, when discussing growth-inducing impacts of a proposed project, "it must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment" (CEQA Guidelines 15126(2d)).

4.22.1 Project Growth Inducement

Insufficient infrastructure in an area is generally an obstacle to growth because new development typically requires water, wastewater treatment, and roadways to be available before local jurisdictions approve developments. Growth in the Sacramento area is presently occurring, and many more developments have been approved or are pending approval, regardless of the presence or absence of electric service. Moreover, local jurisdictions and developers assume that electric service would be provided, regardless of where the development occurs. Because a portion of the proposed Project purpose would be in response to this type of development, it would not remove any current obstacles to growth. SMUD does not have land use authority. These decisions are made by local city and county jurisdictions regardless of the presence or absence of electrical infrastructure. Both SMUD and Roseville are required by law to provide electric service. Therefore, local jurisdictions, property owners, and developers assume that electric service

would be provided regardless of where the development occurs.

4.22.2 No Action Growth Inducement

Under the No Action Alternative, no growth-inducing impacts would occur.

4.22.3 Intentional Destructive Acts

The DOE requires analysis of intentional destructive acts in NEPA analyses. Western considers these acts to be unlikely. In the event that this proposed Project or any part of the power system is targeted, contingency measures are in place to maintain it.

While such acts or natural disasters would stress the power system, protocols are in place to restore power to high priority systems and emergency needs first followed by subsequent needs.

CHAPTER 5
Projects Considered For Cumulative Impact Analysis

NEPA regulations define cumulative effects as those effects that result from incremental impacts of a project when added to past, present, and reasonably foreseeable future actions, regardless of which agency (Federal or nonfederal) or person undertakes such actions. Cumulative effects can result from individually minor but collectively significant actions that take place over a period of time (40 CFR Part 1508.7). They are similarly defined in Section 15355 of CEQA guidelines (2005) as follows:

> "Cumulative impacts refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.
>
> (a) The individual effects may be changes resulting from a single project or a number of separate projects.
>
> (b) The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonable foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time."

The process used in this Cumulative Impact Analysis follows the guidelines provided in the publication "Considering Cumulative Effects under the NEPA," (CEQ January 1997) and the CEQA Guidelines.

Impacts associated with cumulative projects were determined using the conclusions of the environmental document prepared for those projects. Cumulative effects were analyzed using three principal steps: (1) scoping, (2) describing the affected environment, and (3) determining the environmental consequences. The scoping process involved contact and coordination with municipal planners and research of each city and county's General Plans to obtain past, present, and reasonably foreseeable future project information. The majority of the projects had some type of Federal or state environmental documentation (such as Negative Declaration, Finding of No Significant Impact, Environmental Assessment, EIS, and EIR), and others were exempt from environmental review because of their limited environmental effects and did not require environmental analysis.

5.1 CRITERIA FOR SELECTION (BASED ON LIST OF PROJECTS)

5.1.1 Past Projects

According to CEQ guidance, agencies are not required to list or analyze the effects of specific individual past actions unless such information is necessary to describe the cumulative effect of all past actions combined (CEQ 2005). Therefore, Western did not research specific past projects, but rather looked at the overall past land uses in the study area that are primarily agricultural.

5.1.2 Present and Reasonably Foreseeable Future Projects

The projects selected for inclusion in this cumulative impact study are located in the study area and have environmental impacts. This cumulative impact analysis focuses on recent development projects that have the potential to result in environmental impacts. All selected projects are currently under review or have been approved between January 2005 and May 2007.

5.1.3 Cumulative Impact Analysis

The potential cumulative impacts of the proposed Project, when considered with the applicable projects listed in this chapter, are discussed within the individual topical resource sections in Chapter 4, as applicable. Present and reasonably foreseeable future projects within the proposed Project area are listed in Table 5-1. Figure 4.9-3 shows planned developments in the Project area.

Table 5-1. Concurrent Projects within Project Area

State Clearinghouse Number	Lead Agency	Project Title	Project Description
2006049021	Fish & Game #2	Peasant Grove Road at Curry Creek Bridges Replacement	Replacement of two bridges on Pleasant Grove Road at Curry Creek
2006072098	Sacramento Area Flood Control Agency	Funding Mechanism for Comprehensive Sacramento Area Flood Protection and Natomas Cross Canal South Levee Phase I Improvements Project	Improvements to the Cross Canal Levee
1995103063	Caltrans Planning Department	State Route 70 Upgrade	Upgrade SR 70 in Sutter and Yuba counties to four lanes from the SR 99/SR 70 split to McGowan Parkway in Marysville
2005072046	Reclamation Board	American River Watershed-Common Features, Sacramento River East Levee & Natomas Cross Canal Levee Modification	Levee modifications, including setback levees for improved flood control
1992032074	Sacramento County	Metro Air Park	2,000-acre commercial and industrial development east of the Sacramento Airport
2000092026	Sacramento County	Elverta Specific Plan / Countryside Equestrian Estates	1,744-acre residential and commercial development at Elverta Road / 16th Street
2001062035	Sacramento County	Metro Air Parkway / I-5 Interchange	The proposed project consists of a new interchange on I-5, modifications to I-5, and modifications to the Airport Boulevard/I-5 interchange
2004062102	Sacramento County	Upper Northwest Interceptor, Phase 2 and 3, Sections 1-4	Sewer improvements at Elkhorn Boulevard and Cherry Lane
2004102018	Grant Joint Union High School District	Grant Joint Union High School District New High School / Middle School	High school/middle school with a planned enrollment capacity of a total of 2,800 students on about 84-acres at Elkhorn Boulevard and East Levee Road
2005062144	City of Sacramento	Greenbriar Development Project	Annexation to the City of Sacramento and development of about 3,723 housing units and 30 acres of retail and commercial space at Elkhorn Boulevard and SR 99
2005072139	Sacramento Municipal Utility District	Metro Air Park Neighborhood Electric Distribution Project	Construct and operate two 69-kV neighborhood substations and three subtransmission line components along Elverta Road, Power Line Road, and Elkhorn Boulevard
2006012007	Sacramento County	Yuki Pear Orchard Removal	Remove a pear orchard to expand the Airport Operating Area at Garden Highway and Elverta Road
2006022095	Sacramento Municipal Utility District	16th Street-Elverta 69-kV Substation and Overhead Line Project	New substation at 16th Street and Elverta with connecting subtransmission lines

Table 5-1. Concurrent Projects within Project Area

State Clearinghouse Number	Lead Agency	Project Title	Project Description
2006049040	Rio Linda–Elverta Recreation & Park District	Babe Best Park Concession Stand	New park facilities at 7525 10th Street, Rio Linda
2006049042	Rio Linda–Elverta Recreation & Park District	Westside Park Playground Storage Space for Vehicles and Other Apparatus	New recreational facilities at 6555 West 2nd Street, Rio Linda
2006049041	Rio Linda–Elverta Recreation & Park District	Sacramento Northern Depot Welcome Visitors Center	New recreation facilities at Front Street & M Street, Rio Linda
2006049043	Rio Linda–Elverta Recreation & Park District	Harvey House Park / Shop Project	New recreational facilities in Rio Linda
1999062020	Placer County Planning Department	Placer Vineyards Specific Plan Revised Draft EIR (PEIR T200540651)	Multi-use project on 5,158 acres at Baseline Road, Pleasant Grove Road, Dry Creek Road, and Walerga Road
2004062132	Placer County Planning Department	Whisper Creek Subdivision	104-lot residential subdivision at PFE Road, between Walerga and Cook-Riolo roads
2004062133	Placer County Planning Department	Silver Creek Planned Development Subdivision	29 acres near PFE and Walerga roads
2004062141	Placer County Planning Department	Morgan Place (PEIR 2004 0344)	12.5 acres near PFE and Walerga roads
2005082060	Placer County	Placer Ranch Specific Plan	2,200 acres by Fiddyment Road
2005092041	Placer County	Riolo Vineyards Specific Plan EIR	527.5 acres near PFE and Walerga roads
2003122017	Placer County Planning Department	Sunset/Athens Connector Road (EIAQ-3801)	Roadway and bridge connecting Sunset and Athens avenues
2005032026	Placer County Planning Department	De la Salle University and Community Specific Plan	A mixed-use community, with two primary com ponents: the 600-acre De La Salle University/ Campus and the adjoining 536-acre Community; north of Baseline at Brewer Road
2004122127	City of Roseville	Fiddyment 44	Filling 1,528 acres of aquatic habitat, east of Woodcreek Oaks and Foothills
2005049026 (03-AFC-01)	Energy Commission	Roseville Energy Park Project	New Natural Gas Power Plant west of Sun City Roseville, near Pleasant Grove Wastewater Treatment Plant

Table 5-1. Concurrent Projects within Project Area

State Clearinghouse Number	Lead Agency	Project Title	Project Description
2007022043	Sacramento Municipal Utility District	Power Line-Elkhorn Substation Capacity Expansion Project	A proposed capacity expansion project of the Power Line-Elkhorn substation. The existing substation site is connected to the Elverta Circuit #1 and the Natomas Circuit #2 existing overhead (69-kV) lines with SMUD's subtransmission grid system
2007032157	Sutter County	Sutter Pointe Specific Plan	Approximately 7,500-acre mixed-use project proposed in the 9,500-acre Industrial/ Commercial Reserve area currently designated in the Sutter County General Plan
N/A (06-AFC-9)	E&L Westcoast, LLC	Colusa Generating Station	A 600-MW new combined cycle power plant in Colusa County
N/A	Western	2 GHz Spectrum Relocation - CW-RSC portion	Install optical groundwire (OPGW) on the Cottonwood-Roseville 230 kV line
N/A	Western	O'Banion 500 kV Transmission Line and Transformation Station	New transmission lines, system interconnections and/or upgrades of existing transmission facilities in the Sacramento, California area to assure the reliability of electric supplies

Source: CEQAnet 2007, California Energy Commission (CEC) 2007
Note: Date Range 1/1/2005 - 5/1/2007
N/A = Not Available
AFC = Application for Certification
CW-RSC = Cottonwood - Roseville Line
kV = kilovolt
SR = state route

CHAPTER 6
Consultation and Coordination

The following is a list of Federal, Tribal, state, and local agencies contacted during preparation of the SVS Draft SEIS and EIR. Individual groups were contacted for background information, consultation, and general input.

6.1 FEDERAL

- U.S. Army Corps of Engineers
- U.S. Department of Agriculture
- Natural Resource Conservation Service
- U.S. Department of Energy
- Federal Energy Regulatory Commission
- U.S. Department of the Interior
- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- U.S. Environmental Protection Agency

6.2 TRIBAL

- Indian Canyon Mutsun Band of Costanoan
- Ione Band of Miwok Indians
- Miwok Indian Community
- Muwekma Indian Tribe
- Shingle Springs Band of Miwok Indians
- United Auburn Indian Community of the Auburn Rancheria
- Wilton Rancheria

6.3 STATE

- California Air Resources Board
- California Department of Fish and Game
- California Department of Transportation
- California Environmental Protection Agency
- California Native American Heritage Commission
- California Public Utilities Commission
- California Regional Water Quality Control Board, Central Valley Region
- California State Department of Parks and Recreation
- State Historic Preservation Office

6.4 CITIES AND COUNTIES

Cities

- Roseville
- Sacramento

Counties

- Feather River Air Quality Management District
- Placer County Air Pollution Control District
- Placer County Planning Department
- Sacramento Metropolitan Air Quality Management District
- Sacramento County Planning Department
- Sutter County Planning Department

6.5 OTHER

- The Natomas Basin Conservancy

CHAPTER 7
List Of Agencies, Organizations, And Individuals Receiving The Sacramento Area Voltage Support Supplemental Environmental Impact Statement And Environmental Impact Report

Individuals who received the SVS Draft SEIS and EIR are listed below.

Allen, Wayne Nevada City, CA 95959	Arbios, Zack Elverta, CA 95626	Artrip, Gregory and Shelley Elverta, CA 95626
Bianchi, Gertrude Elverta, CA 95626	Bianchi, John Pleasant Grove, CA 95668	Borgman, Melvin J. and Charlotte E. Pleasant Grove, CA 95668-0743
Borgman, Tina Pleasant Grove, CA 95668	Brown, Bill and Sharon Elverta, CA 95626	Christie, Chris Roy Elverta, CA 95626
Driggs, Richard and Judith Elverta, CA 95626	Enos, Rose Auburn, CA 95603	Franklin, Emma Sacramento, CA 95833
Gardner, Robert and Rochelle Elverta, CA 95626	Gerolamy, Rob Roy Elverta, CA 95626	Gianella, Tom & Elizabeth Yuba City, CA 95991
Hendrix, Richard and Lois Elverta, CA 95626	Henton, Fred Pleasant Grove, CA 95668	Holzmeister, Rich Elverta, CA 95626
Hussain, Nihad A. Sacramento, CA 95835	James, Lauren Pleasant Grove, CA 95668	James, Norman Pleasant Grove, CA 95668
Jones, Jeff Roseville, CA 95661	Keenan, Wendall Pleasant Grove, CA 95668	Klasson, Mick Davis, CA 95616
Koo, Haesun Los Angeles, CA 90049	Krause, Gary El Dorado Hills, CA 95712	Lamar, John and Sally Pleasant Grove, CA 95668
Lee, Jong-Il Marcus Schererville, IN 46375	Lienert, Albert and Shirley Nicolaus, CA 95659	Lim, Yekun and Inok Santa Monica, CA 90402
Logsdon, Robert Elverta, CA 95626	Manich, Stephen Pleasant Grove, CA 95668	Marine, Joe Sacramento, CA 95822
Miller, Tony Pleasant Grove, CA 95668	Ose, Doug Sacramento, CA 95825	Scheidel, Silmer Pleasant Grove, CA 95626
Schiedel, La Verne Elverta, CA 95626	Simangan, Steve Sacramento, CA 95835	Toler, Lana Pleasant Grove, CA 95668
Van Dyke, Gary Pleasant Grove, CA 95668	Viducich, Mark and Catherine Pleasant Grove, CA 95668	Wallace, Robert & Shirley Pleasant Grove, CA 95668
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Organizations and agencies that received the SVS Draft SEIS and EIR are listed below.

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CHAPTER 8
List Of Preparers

Name	Responsibilities	Experience
Western Area Power Administration (Western)		
Tuggle, Steve	Natural Resources Manager (2006–present)	Mr. Tuggle has a bachelor's degree in natural resource management, with over 10 years of environmental experience.
McMahon, Loreen	Project Management (2000-2006)	Ms. McMahon has a master's degree in public policy and administration, with an emphasis on environmental policy and a bachelor's degree in political science. She has worked within the government for 24 years, including 14 years with Western.
Barger, Mary	Cultural Resources	Ms. Barger has a bachelor's degree in cultural resources from Western Illinois University. Ms. Barger's graduate studies were accomplished at Western Michigan University. Ms. Barger has 28 years' experience as a Federal archaeologist and 13 years' experience with Western.
Bridges, John	Biological Resources	Mr. Bridges has a bachelor's degree and master's degree in zoology from Eastern Illinois University. He has 19 years' experience as a consultant to the energy industry including 16 years with Western. His expertise includes terrestrial biological issues, avian protection programs, and endangered species consultations.
Burton, Gary	Natural Resources	Mr. Burton has a bachelor's degree in fisheries/microbiology from Colorado State University. He has worked as a Federal fishery biologist for 20 years, including 8 with Western.
Christy, David	Public Involvement	Mr. Christy has a bachelor's degree in anthropology. He has over 24 years' experience in public involvement.
Cooper, Charles, PE	Maintenance Manager	Mr. Cooper has a bachelor's degree in electrical engineering and is a registered professional engineer in California. Mr. Cooper has 34 years' experience in power system engineering with the Bureau of Reclamation and Western.
Cunningham, Catherine	Environmental Planning Health and Safety	Ms. Cunningham has a bachelor's degree in animal science. She has 7 years' experience in biological research and 15 years' experience environment, safety, and health, respectively.
House, Phil	Power Resource Planning	Mr. House is a hydraulic engineer. He has worked for Western for 18 years in the area of power resource planning.
Kawamura, Koji	Legal	Mr. Kawamura has a juris doctorate from the University of Colorado at Boulder. His studies emphasized environmental and natural resource law. He has worked with the U.S. Forest Service and Western and is admitted to the state and Federal bars in Colorado.
Kyriss, LaVerne	Communications Public Involvement	Ms. Kyriss has a bachelor's degree in psychology and a master's degree in communications. She has more than 25 years of communications, public involvement, and editing experience, including 19 years with Western.
Le Blanc, Frederick J.	Power System Operations	Mr. Le Blanc, has a bachelor's degree in business administration and 37 years' experience in power system operations in public power. He has worked for Western since 1998.

Name	Responsibilities	Experience
Mathias, Kenneth, PE	Air Quality EMF Noise	Mr. Mathias is a Registered Professional mechanical engineer, with a bachelor's degree in mechanical engineering and a master's degree in geology and geophysics. He has over 24 years' experience in power system design and development, geophysical exploration, and environmental planning and compliance.
Miller, Heidi R.	Lands	Ms. Miller has a bachelor's degree in business administration with a concentration in accounting. She has worked for Western for 16 years, with over 14 years' experience in the Lands Division.
Mirzadeh, Mariam A.	Transmission Planning	Ms. Mirzadeh has a master's degree in electrical engineering. She has over 24 years' experience in the field of electrical engineering. She has worked for Western since 1992, with the last 7 years in transmission planning.
Roberts, Donald A.	Project Engineer	Mr. Roberts has a bachelor's degree in civil engineering. He has over 24 years' experience in the fields of heavy construction and project management. He has worked for Western since 1991.
Sabet, Morteza	Transmission Planning Operations	Mr. Sabet has a bachelor's degree in electrical engineering and over 34 years' experience in power system operation, project development, and engineering. He has worked for Western since 1980. Before joining Western, Mr. Sabet worked with a variety of utilities and a state regulatory agency.
Sinclair, Susan	Real Estate Specialist	Ms. Sinclair has a master's degree in art history from California State University, Sacramento. She has 9 years' experience as an employee with Western. At Western, Ms. Sinclair is employed as a real estate specialist. She is knowledgeable of property rights and has worked on three major transmission line projects in the last few years.
Swanson, Dave	Environmental Team Leader	Mr. Swanson has a bachelor's degree in biological studies. He has 24 years of environmental planning experience and 6 years of energy development experience.
Sacramento Municipal Utility District		
Cameron, Craig	Transmission Operations	Mr. Cameron has more than 15 years' experience in the utility industry, primarily as an operations engineer and transmission planning engineer. Prior to joining SMUD as a principal operations engineer, he worked for San Diego Gas & Electric and the California ISO.
Deis, Michael, PE	Senior Project Manager	Mr. Deis has a bachelor's degree in civil engineering. He has more than 25 years of project management experience at SMUD.
Scott, Ron	CEQA/NEPA and Environmental Permitting	Mr. Scott has a bachelor's degree in biology with an emphasis in marine biology. He has worked for SMUD for more than 26 years primarily as an environmental project manager.
City of Roseville		
Hung, Kam, PE	Design System Strategy	Mr. Hung has 35 years of experience in the field of power transmission and distribution engineering. He graduated in 1971 in electrical engineering and holds a professional engineer's license in the State of California.

Name	Responsibilities	Experience
Morse, Mark	CEQA and Environmental Permitting	Mr. Morse has a bachelor's degree in environmental studies with an emphasis in city and regional planning. He has 20 years of public and private sector experience working in the field of environmental review and analysis.
Burleson Consulting, Inc. (Burleson)		
Tassey, Roberta	Project Manager, Biology, Land Use	Ms. Tassey has a bachelor's degree in biology and is a senior scientist with Burleson. She has over 24 years' experience in the environmental field and is experienced with NEPA and CEQA requirements.
Brown, Matthew	Public Participation Graphics GIS	Mr. Brown has a bachelor's degree in graphic arts and has 3 years experience with public participation support. He is experienced in developing the ACCESS database for the administrative record. He also provides support for publishing environmental documents using InDesign® and Illustrator®.
Burleson, Nadia, PE	Air Quality, Traffic	Ms. Burleson is a registered professional engineer in California. She received her master's degree in civil engineering and a bachelor's degree in chemical engineering. Ms. Burleson has over 20 years of environmental engineering, project management and quality control experience.
Burleson, Robert	Floodplain, Land Use, Soils	Mr. Burleson is a project manager with over 20 years of experience. Mr. Burleson has a bachelor's degree in agricultural and managerial economics. He is experienced in NEPA/CEQA documents and has completed property appraisals, environmental site assessments, valuation reports for land sales, and condemnation reports. He is also experienced at construction oversight and title/legal description verification.
Dains, Virginia	Biological Resources	Ms. Dains has a master's degree in biology from California State University, Sacramento. She conducts special-status plant surveys throughout California and western Nevada. These projects were conducted for state, Federal, or private concerns and included habitat field mapping, mitigation measures, and conservation guidelines.
Knight, Jonathan	GIS	Mr. Knight has a bachelor's degree in geography with an emphasis in GIS. He is knowledgeable in the application of GIS technology to natural resource management and environmental analysis programs.
Marchek, Jennifer	Air Quality	Ms. Marchek received her bachelor's degree in chemical engineering and has over 10 years of environmental experience. She was employed with the Sacramento Metropolitan Air Quality Management District and has worked with industries to comply with air pollution regulations. She has completed air emission inventories and calculations and prepared permit applications.
Overlin, Annie	Biological Resources	Ms. Overlin has a bachelor's degree in botany from Colorado State University. She is an experienced botanist and wildlife biologist with 10 years of environmental experience. She has extensive experience developing inventory and monitoring systems in riparian environments, and completing wetland delineations and vegetation mapping throughout the western United States.

Name	Responsibilities	Experience
Powers, Meghan	Biological Resources	Ms. Powers has a bachelor's degree in aquatic biology from the University of California, Santa Barbara. Ms. Powers has 2 years of environmental compliance experience and has completed biological surveys, restoration and recovery projects, and NEPA/CEQA studies.
Rice, Ammon	Biological Resources	Mr. Rice has a master's degree in biology and 3 years of environmental compliance experience. He has completed biological surveys, restoration and recovery projects, and NEPA/CEQA studies.
Smith, Rex, RG	Geology	Mr. Smith has a bachelor's degree in geology and hydrology. Mr. Smith is a California Professional Geologist with over 24 years experience in field geology and environmental consulting. He has extensive experience in field hydrogeology, soil and groundwater investigations and remediation, and environmental assessments.
Walker, Sheila	Editorial Review	Ms. Walker has a bachelor's degree in english and over 20 years of editorial review experience.
Aspen Environmental Group		
Birdsall, Brewster	Noise	Mr. Birdsall has a bachelor's degree in mechanical engineering from Lehigh University and a master's degree in civil engineering from Colorado State University. Mr. Birdsall has 10 years' experience as an environmental scientist and specializes in air quality and noise analyses for land development-related projects and air quality risk assessments.
Hawkins, Jacob	Visual	Mr. Hawkins has a bachelor's degree in biology from San Francisco State University and a master's of environmental science and management from the University of California, Santa Barbara. He has extensive experience preparing EIR, EIS, NEPA, and CEQA documents.
Vahidi, Negar	Environmental Justice, Socioeconomics	Ms. Vahidi has a bachelor's degree in political science from University of California, Irvine, and a master's of public administration from University of Southern California. Ms. Vahidi is an environmental planner, with over 11 years of experience managing and preparing a variety of Federal and State of California environmental, planning, and analytical documents for large-scale infrastructure and development projects.
Blair, Heather	Biology	Ms. Blair has a bachelor's degree in biology and is experienced in botanical and wildlife field surveys, report preparation and information and data management. She has experience preparing EIRs in compliance with CEQA/NEPA. Her biological background includes native habitat restoration and laboratory analysis. Other experience consists of experimental design and logistical support for field surveys.
Murphy, Tom	Contract Manager	Mr. Murphy has a master's degree in physical geography and a bachelor's degree in earth science, with more than 13 years of experience in environmental assessment, compliance, and planning, including work under CEQA/NEPA, the Clean Air Act, the Clean Water Act, and numerous Federal, state, and local environmental regulations.

Name	Responsibilities	Experience
CH2MHill		
Bone, Jason	GIS	Mr. Bone has a bachelor's degree in geography, with over 10 years of experience with databases, GIS, and GPS surveying.
Davy, Doug	Cultural Resources	Mr. Davy has a doctorate in archaeology with 22 years of experience in cultural resources management, including prehistoric and historic archaeology, historic buildings and structures, and Native American consultation. Mr. He is experienced as a manager of archaeological field projects in support of energy and transportation, projects.
Pacific Legacy		
Shapiro, Will	Cultural Resources	Mr. Shapiro has a master's degree in anthropology with over 23 years of experience in archeological research. He is experienced with conducting cultural resource surveys, inventories, and evaluations for National Register eligibility, prehistoric and historic archaeological site testing and data recovery excavations, and compliance with cultural resource regulations under the National Historic Preservation Act (Section 106).
SWCA		
DeBusk, Jessica	Paleontology	Ms. DeBusk has a bachelor's degree in geological sciences and over 10 years of experience with paleontology studies for CEQA and NEPA projects. She manages several projects, oversees daily activities in the paleontology preparation laboratory, directs all paleontology field staff, and provides field support as a qualified paleontological monitor. Ms. DeBusk has also been certified on a project-specific basis through the California Energy Commission (CEC) as a paleontological resource monitor.
Corsetti, Cara	Paleontology	Ms. Corsetti has an master's degree in geological sciences, with concentration in paleobiology. She oversees all paleontological projects assigned to the California region for SWCA.

CHAPTER 9
References

9.1 GENERAL

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