Volume 1 of 7

Final Environmental Impact Report/Statement

Southern California Edison's Application for the

Tehachapi Renewable Transmission Project

Application No. A.07-06-031

SCH No. 2007081156

Tehachapi Wind Turbines

Segment 4 in NW Antelope Valley

Segment 6 in Angeles National Forest

Gould Substation

Segment 8 in Rowland Heights

Chino Hills State Park

Segment 8 in Chino

Mira Loma Substation

Lead Agencies:

California Public Utilities Commission

USDA Forest Service

Prepared by:

Aspen Environmental Group

October 2009

COVER SHEET

Title: Tehachapi Renewable Transmission Project (TRTP)

Subject: Final Environmental Impact Report/Environmental Impact Statement (EIR/EIS)

Lead Agencies: California Public Utilities Commission and U.S. Department of Agriculture, Forest Service.

Abstract: Southern California Edison (SCE) proposes to construct, use, and maintain new and upgraded transmission infrastructure along approximately 173 miles of new and existing rights-of-way (ROW) from the Tehachapi Wind Resource Area in southern Kern County south through Los Angeles County and the Angeles National Forest (ANF) and east to the existing Mira Loma Substation in San Bernardino County, California. The TRTP consists of eight segments enumerated as Segments 4 through 11. The major components of SCE's proposed Project consist of the following:

- A new single-circuit 500-kV transmission line (T/L) between the Windhub Substation and the proposed Whirlwind Substation (Segment 10). Two new single-circuit 220-kV T/Ls along new ROW from the Cottonwind Substation to the proposed new Whirlwind Substation (Segment 4 – 220 kV). A new single-circuit 500-kV T/L from the proposed new Whirlwind Substation to the existing Antelope Substation (Segment 4 – 500 kV).
- Rebuilding approximately:
  - 18 miles of the existing Antelope-Vincent 220-kV T/L and the existing Antelope-Mesa 220-kV T/L to 500-kV standards between the existing Antelope and Vincent Substations (Segment 5)
  - 19 miles of existing 220-kV T/L to 500-kV standards between the existing Vincent and Gould Substations. Also adding a new 220-kV circuit on the vacant side of the existing double-circuit structures of the Eagle Rock-Mesa 220-kV T/L (Segment 11).
  - 32 miles of existing 220-kV T/L to 500-kV standards from the existing Vincent Substation to the southern boundary of the ANF, including approximately 27 miles of the existing Antelope-Mesa 220-kV T/L and approximately 5 miles of the existing Vincent-Rio Hondo 220-kV No. 2 T/L (Segment 6).
  - 16 miles of existing 220-kV T/L to 500-kV standards from the southern boundary of the ANF to the existing Mesa Substation. (Segment 7).
  - 33 miles of existing Mesa-Chino 220-kV T/L to 500-kV standards east of the existing Mesa Substation to the existing Mira Loma Substation. Also rebuilding approximately 7 miles of the existing Chino-Mira Loma No. 1 line from single-circuit to double-circuit 220-kV structures (Segment 8).
- Building the new Whirlwind Substation (Segment 9), upgrading the existing Antelope, Vincent, Mesa, Gould, and Mira Loma Substations to accommodate new T/L construction and system compensation elements (Segment 9), and installation of associated telecommunications infrastructure.

This EIR/EIS evaluates the impacts of the proposed Project and a wide range of alternatives, including the No Project/Action Alterative, alternate routes, a partial underground alternative, and alternate construction methods. The primary environmental resource issues analyzed in this document were potential effects on (1) air quality, (2) biological resources, (3) aesthetic resources, (4) cultural resources, (5) erosion, and (6) recreation.

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Executive Summary

ES.1 Introduction

On June 29, 2007, Southern California Edison (SCE) submitted Application No. A.07-06-031 to the California Public Utilities Commission (CPUC) for a Certificate of Public Convenience and Necessity (CPCN), as required for the construction and operation of the proposed Tehachapi Renewable Transmission Project (TRTP or "proposed Project"). With the CPCN application, SCE also submitted its Proponent's Environmental Assessment (PEA) for the proposed Project. Because the proposed transmission line would traverse approximately 42 miles of National Forest System (NFS) lands, SCE also filed an application for a Special Use authorization with the USDA Forest Service on June 29, 2007, seeking permission for construction, operation, and maintenance of the proposed Project on NFS lands in the Angeles National Forest (ANF). Because the proposed Project also crosses lands owned by the U.S. Army Corps of Engineers (USACE), the USACE has elected to participate as a Cooperating Agency for the environmental review of the Project. In addition, portions of Alternative 4 (see Section ES.3 below) cross land owned by the California Department of Parks and Recreation (CDPR), which would require discretionary approvals from both the California State Park and Recreation Commission and CDPR.

The TRTP would involve new and upgraded transmission infrastructure along approximately 173 miles of new and existing rights-of-way (ROW) in southern Kern County, portions of Los Angeles County, including the ANF, and the southwestern portion of San Bernardino County, California. SCE's stated objectives for the proposed Project are to provide the electrical facilities necessary to integrate levels of new wind generation in excess of 700 MW and up to approximately 4,500 MW in the Tehachapi Wind Resource Area (TWRA) (SCE, 2007). Because the proposed TRTP would serve future wind development projects in the TWRA, the potential effects of these future wind projects are addressed in Chapter 6 (Development of the Tehachapi Wind Resource Area) of this Environmental Impact Report/Statement (EIR/EIS) in order to better understand their contribution to the cumulative impacts of TRTP. These projects are not considered connected actions to TRTP and are outside the scope of the proposed action and alternatives for this EIR/EIS. This document is not intended to provide CEQA/NEPA compliance or result in any regulatory approvals for wind generation projects. For the purposes of California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), the Project's three primary objectives are to:

- Provide the electrical facilities necessary to reliably interconnect and integrate in excess of 700 MW and up to approximately 4,500 MW of new wind generation in the TWRA currently being planned or expected in the future, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard (RPS) goals in an expedited manner (i.e., 20 percent renewable energy by year 2010 per California Senate Bill 107).
- Further ~~A~~address the reliability needs of the California Independent System Operator (CAISO) controlled grid due to projected load growth in the Antelope Valley.
- Address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin.

These objectives are described in detail in Section 1.2 of this EIR/EIS.

The CPUC is the State Lead Agency responsible for compliance with CEQA and the USDA Forest Service is the Federal Lead Agency responsible for compliance with NEPA. A joint document has been prepared by the Lead Agencies that consists of a ~~Draft~~ Final EIR prepared in compliance with State

CEQA Guidelines and a ~~Draft~~ Final EIS prepared in compliance with NEPA guidance. The EIR/EIS discloses the environmental impacts expected to result from the construction and operation of SCE's proposed Project and recommended mitigation measures, which if adopted by the Lead Agencies, could avoid or minimize adverse~~significant~~ environmental effects. In accordance with CEQA/NEPA guidance, the EIR/EIS also evaluates alternatives (including the No Project/Action Alternative) to the proposed Project that address significant environmental issues associated with the Project.

The primary components of the proposed Project include:

- Construction of new 500-kV single-circuit transmission lines;
- Construction of new single-circuit 220-kV transmission lines;
- Rebuilding of existing 220-kV transmission lines to 500-kV standards;
- Rebuilding of existing single-circuit transmission lines to double-circuit transmission lines;
- Relocation of several existing 66-kV subtransmission lines;
- Construction of a new 500-kV substation; and
- Upgrading of five existing substations.

Approximately 42 miles of the proposed Project would be located on NFS lands in the ANF. In addition, approximately 6.4 miles of the proposed Project would be located on land owned by the USACE in the vicinity of Santa Fe Dam and Whittier Narrows in Los Angeles County (Segments 7 and 8 of the proposed Project). A summary of the components of the proposed Project and alternatives is presented in Table ES-1.

A wide range of potential alternatives were considered in the preparation of this ~~Draft~~ EIR/EIS and a screening process was used to identify alternatives that:

- Were feasible;
- Fulfilled the Project's purpose and need; ~~and~~
- Would avoid or lessen adverse effects ~~Addressed significant issues~~ associated with SCE's proposed Project; and
- Would meet CAISO, Western Electricity Coordinating Council (WECC), and North American Electric Reliability Corporation (NERC) reliability planning criteria.

The process used to identify, evaluate, and screen potential alternatives is described in the Alternatives Screening Report in Appendix A of this EIR/EIS. The alternatives that met the CEQA/NEPA criteria and were carried forward for detailed analysis are fully described in Chapter 2 (Description of Alternatives) of this EIR/EIS. The alternatives, including SCE's proposed Project, are analyzed across 16 environmental issue areas in Chapter 3 (Affected Environment and Environmental Consequences) of this EIR/EIS. The EIR/EIS presents an analysis of the environmental effects of the proposed Project and alternatives, recommends mitigation measures to address adverse impacts, and provides a comparison of the environmental effects of the proposed Project and the alternatives.

This Executive Summary complies with NEPA/CEQA by stressing: areas of controversy; issues raised by agencies and the public; issues to be resolved; choices among alternatives; and major conclusions.

Table ES-1. Summary Comparison of Components of the Proposed Project and Alternatives

	Alternative 2 (SCE's Proposed Project)	Alternative 3 (West Lancaster)	Alternative 4 (Chino Hills Routes)	Alternative 5 (Partial Underground)	Alternative 6 (Max. Helicopter in ANF)	Alternative 7 (66-kV Subtransmission)
Overall Project Construction						
Total length of 500-kV and 220-kV transmission line (T/L) ROW (miles)	172.59	172.933	Route A: 156.87.2 Route B: 160.48 Route C: 159.0162.8 Route C Mod: 158.2 Route D: 160.58	172.59	172.59	172.59
Total number of new transmission structures (not including 66-kV sub-T/Ls)	853	852	Route A: 762 Route B: 781 Route C: 802 Route C Mod: 791 Route D: 791	838	853	853
Total land disturbance (acres, ±15%) (Construction / Permanent)	~1,612538 / ~349277	~1,612538 / ~349*277	Route A: ~1,512 / ~291 1,651 / ~366 Route B: ~1,539 / ~281 1,678 / ~356 Route C: ~1,567 / ~287 1,729/ ~365 Route C Mod: ~1,708 / ~386 Route D: ~1,549/ ~290 1,688 / ~365	~1,637563 / ~352280	~1,526456 / ~303230	~1,612538* / ~349277**
On NFS lands	~26872 / ~109	~26872 / 109	~26872 / ~109	~26872 / ~109	~195203 / ~62	~26872 / ~109
Segment 10: New Whirlwind – Windhub 500-kV T/L						
Segment Length (miles)	16.8	16.8	16.8	16.8	16.8	16.8
New transmission structures	96	96	96	96	96	96
Segment 4: Whirlwind 500/220 kV T/L Elements						
Segment Length (miles)	19.6	20.0	19.6	19.6	19.6	19.6
New transmission structures	165	164	165	165	165	165
Segment 5: Antelope – Vincent No. 2 500-kV T/L						
Segment Length (miles)	17.48	17.48	17.48	17.48	17.48	17.48
New transmission structures	67	67	67	67	67	67
Segment 11: New Mesa – Vincent (via Gould) 500/220-kV T/L						
Segment Length (miles)	36.2	36.2	36.2	36.2	36.2	36.2
Distance on NFS lands (miles)	20.4	20.4	20.4	20.4	20.4	20.4
New transmission structures***	76	76	76	76	76	76
No. on NFS lands[1]	59	59	59	59	59	59
No. constructed by helicopter	16	16	16	16	56	16
Helicopter staging areas	7	7	7	7	4	7
No. on NFS lands	4	4	4	4	3	4

[1] There are a total of 68 structures on NFS lands in Segment 11; where 59 structures are new and 109 are existing double-circuit structures of the Eagle Rock-Mesa 220-kV T/L where new 220-kV conductor would be strung on the vacant side of these structures.

Table ES-1. Summary Comparison of Components of the Proposed Project and Alternatives

	Alternative 2 (SCE's Proposed Project)	Alternative 3 (West Lancaster)	Alternative 4 (Chino Hills Routes)	Alternative 5 (Partial Underground)	Alternative 6 (Max. Helicopter in ANF)	Alternative 7 (66-kV Subtransmission)
Total new/improved/maintained roads (±15%)	~39.6740.05 miles	~39.6740.05 miles	~39.6740.05 miles	~39.6740.05 miles	~22.823.13 miles	~39.6740.05 miles
On NFS lands (±15%)	~32.6583 miles	~32.6583 miles	~32.6583 miles	~32.6583 miles	~15.916.01 miles	~32.6583 miles
Newly constructed roads on NFS lands (±15%)	~1.315 miles	~1.315 miles	~1.315 miles	~1.315 miles	~0.326 miles	~1.315 miles
Segment 6: Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV) and Section of New Mira Loma – Vincent 500-kV T/L						
Segment Length (miles)	26.9	26.9	26.9	26.9	26.9	26.9
Distance on NFS lands (miles)	21.85	21.85	21.85	21.85	21.85	21.85
New transmission structures***	138	138	138	138	138	138
No. on NFS lands	105	105	105	105	105	105
No. constructed by helicopter	17	17	17	17	9287	17
Helicopter staging areas	65	65	65	65	97	65
No. on NFS lands	54	54	54	54	97	54
Total new/improved/maintained roads (±15%)	~59.9660.79 miles	~59.9660.79 miles	~59.9660.79 miles	~59.9660.79 miles	~34.275.2 miles	~59.9660.79 miles
On NFS lands (±15%)	~57.308.13 miles	~57.308.13 miles	~57.308.13 miles	~57.308.13 miles	~31.792.55 miles	~57.308.13 miles
Newly constructed roads on NFS lands (±15%)	~3.062.85 miles	~3.062.85 miles	~3.062.85 miles	~3.062.85 miles	~0.4630 mile	~3.062.85 miles
Segment 7: Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV) and Section of New Mira Loma – Vincent 500-kV T/L						
Segment Length (miles)	15.8	15.8	15.8	15.8	15.8	15.8
New transmission structures	85	85	85	85	85	85
New subtransmission structures	150	150	150	150	150	128
Segment 8: Section of New Mira Loma – Vincent 500-kV T/L						
Segment Length (miles) Segment 8A/8C	33.0	33.0	Route A: 23.2 Route B: 26.7 Route C: 26.322.7 (includes re-routing of existing 220/500kV T/Ls) Route C Mod: 25.5 miles (includes re-routing of existing 220/500kV T/Ls) Route D: 26.8	33.0	33.0	33.0
Segment 8B	6.8	6.8	None6.8	6.8	6.8	6.8
New transmission/ subtransmission structures	226 / 55	226 / 55	Route A: 135 / 0 Route B: 154 / 0 Route C: 175 / 0 Route C Mod: 164 / 0 Route D: 164 / 0	211 / 55	226 / 55	226 / 45

Table ES-1. Summary Comparison of Components of the Proposed Project and Alternatives

	Alternative 2 (SCE's Proposed Project)	Alternative 3 (West Lancaster)	Alternative 4 (Chino Hills Routes)	Alternative 5 (Partial Underground)	Alternative 6 (Max. Helicopter in ANF)	Alternative 7 (66-kV Subtransmission)
Components within Chino Hills State Park	None	None	Route A: 2.3-mile T/L; Switching station Route B: 4.9-mile T/L. Route C: 3.1-mile T/L; Remove 25 structures Route C Mod: 3.0-mile T/L; Remove 21 structures Route D: 1.4-mile T/L	None	None	None
Segment 9: Substation Facilities						
New Whirlwind Substation (area)	96.8~~65~~ acres	96.8~~65~~ acres	96.8~~65~~ acres	96.8~~65~~ acres	96.8~~65~~ acres	96.8~~65~~ acres
Antelope & Vincent Substations	Expand/upgrade (500-kV & 220-kV equipment)	Expand/upgrade (500-kV & 220-kV equipment)	Expand/upgrade (500-kV & 220-kV equipment)	Expand/upgrade (500-kV & 220-kV equipment)	Expand/upgrade (500-kV & 220-kV equipment)	Expand/upgrade (500-kV & 220-kV equipment)
Mesa & Gould Substations	Upgrade (220-kV)	Upgrade (220-kVt)	Upgrade (220-kV)	Upgrade (220-kV)	Upgrade (220-kV)	Upgrade (220-kV)
Mira Loma Substation	Upgrade (500-kV)	Upgrade (500-kV)	No upgrades	Upgrade (500-kV)	Upgrade (500-kV)	Upgrade (500-kV)

Information provided here is based on SCE's preliminary design for the TRTP and is subject to change during final engineering.

* Land disturbance under Alternative 3 would decrease by a factor of one structure within Segment 4. As such, the acres disturbed would continue to be almost identical to Alternative 2.

** Alternative 7 would have some additional temporary disturbance associated with underground construction of the 66-kV subtransmission lines in Segment 7 through the Duck Farm Project area and due to the overhead re-routing the 66-kV line in the Whittier Narrows Recreation area in Segments 7 and 8A. New access and spur roads may result in additional permanent land disturbance compared to the proposed Project in the area of ~~also be required for~~ the new approximately ~~1,200~~ 1,600 foot ROW for the San Gabriel River crossing within Segment 8A associated with the Whittier Narrows Overhead Re-Route (Option 1) or within the expanded ROW between Durfee Avenue and the San Gabriel River (Option 2).

*** Construction of Alternative 6 would be identical to Alternative 2, with the exception of Segments 6 and 11, where substantially more helicopter construction may result in a longer construction schedule.

Based on current information, Alternatives 2 and 6 would each use a total of 13 helicopter staging areas. Under Alternative 2, 9 of 13 would be on NFS lands; under Alternative 6, 12 of 13 would be on NFS lands.

ES.2 Areas of Controversy, Issues Raised, and Issues to be Resolved

The CPUC and Forest Service determined that the proposed Project could cause a significant adverse effect on the environment and, therefore, initiated the preparation of an EIR/EIS. The CPUC filed a Notice of Preparation (NOP) with the State Clearinghouse and the Forest Service published a Notice of Intent (NOI) in the *Federal Register*. These notices formally initiated a public scoping period during which public and agency input was solicited regarding the scope of issues that should be addressed in the EIR/EIS. The list below is a summary of the areas of controversy and issues identified in the scoping process.

- Controversy emerged during the scoping process regarding Segment 8A in the City of Chino Hills. Local residents and City officials are opposed to the construction of a 500-kV double-circuit transmission line through the residential areas of the City. In Chino Hills, the proposed 500-kV line would replace an existing 220-kV line that is currently de-energized. Concerns expressed about this portion of Segment 8A include adverse visual impacts on the community, exposure of nearby residents to EMF, public safety concerns, and potential adverse effects on local property values.
- The California Department of Parks and Recreation (CDPR) has expressed ~~opposition to~~concern about alternative routes proposed by the City of Chino Hills that would route the transmission line through portions of Chino Hills State Park in order to avoid ~~feasible~~ transmission upgrades in residential areas of the City. The CDPR had indicated that any transmission improvements within Chino Hills State Park would be inconsistent with the Park's General Plan and, therefore, would not be permitted absent amendments to the General Plan.
- The Watershed Conservation Authority (WCA) has approved a recreation, water quality, and habitat restoration project known as the River Commons Project within the ROW for Segment 7 adjacent to the San Gabriel River. The WCA is concerned that the replacement and relocation of transmission structures across the River Commons site will adversely affect its plans for construction of the River Commons Project and may require modification of project site plans to accommodate the proposed Segment 7 improvements.
- Concern was expressed at scoping meetings about the potential adverse effects of Segment 8A on the native habitat and wildlife corridor that has been established along the crest of the Puente Hills. Expressed concerns include the potential for adverse effects related to native habitat, wildlife movement, recreational trail use, and visual resources. These concerns were expressed by local residents and the Puente Hills Landfill Native Habitat Preservation Authority.

The environmental issue/resource areas identified during the scoping process are listed in Table ES-2 below and are discussed in detail in Sections 3.2 through 3.17 of this EIR/EIS.

Table ES-2. Environmental Resource/Issue Areas Identified During the Scoping Process

Issue/Resource Area	Topics Addressed in the Analysis	
Agricultural Resources	• Conversion of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance	• Interference with agricultural operations • Conflicts with Williamson Act contracts
Air Quality	• Generation of air pollutant emissions during construction and operation • Objectionable odors	• Compliance with applicable air quality management plans
Biological Resources	• Riparian habitat and other sensitive natural communities • Endangered and threatened species and critical habitat for such species • Federally protected wetlands as defined by Section 404 of the Clean Water Act	• Candidate, sensitive, and special-status species • Wildlife corridors • Conflicts with any local policies or ordinances protecting biological resources • Conflicts with an adopted Habitat Conservation Plan or Natural Communities Conservation Plan
Cultural Resources	• Historic properties or Traditional Cultural Properties • Historical resources or unique archaeological sites	• Cultural resources included in a local register of historical resources • Native American human remains

Table ES-2. Environmental Resource/Issue Areas Identified During the Scoping Process		
Issue/Resource Area	Topics Addressed in the Analysis	
Environmental Contamination and Hazards	• Soil contamination, including flammable or toxic gases • Mobilization of contaminants currently existing in the soil	• Exposure of workers or the public to contaminated or hazardous materials
Geology, Soils, and Paleontology	• Unique geologic features or geologic features of unusual scientific value • Known mineral and energy resources • Triggering or acceleration of geologic processes, such as landslides or soil erosion • Earthquake-related ground rupture in the vicinity of major fault crossings	• Seismically induced ground shaking, landslides, liquefaction, settlement, lateral spreading, and surface cracking • Corrosive soils and other unsuitable soils • Potential for future slope failures on existing unstable slopes • Scientifically important paleontological resources
Hydrology and Water Quality	• Degradation of water quality • Depletion of groundwater supplies or interference with groundwater recharge	• Flood hazards • Erosion, siltation, and flood-related damage • Inundation by mudflow
Land Use	• Preclusion of permitted land uses	• Conflicts applicable federal, State or local land use plans, goals, or policies
Noise	• Temporary or periodic increases in ambient noise levels during construction	• Permanent increases in ambient noise levels in the vicinity of sensitive receptors
Public Services and Utilities	• Demand for public services • Interference with existing emergency access • Interruption of existing utility systems	• Effects on water treatment, wastewater treatment, or solid waste facilities • Water entitlements and resources
Socioeconomics	• Population, housing, and employment • Quality of life • Private property values	• Agricultural revenues • Public agency revenue
Traffic and Transportation	• Traffic congestion during construction due to road or lane closures • Level of service on roadways in the area • Temporary access restrictions during construction • Restriction of emergency vehicle movement during construction • Disruption of bus transit service during construction	• Disruptions of rail, aviation, bicycle, or pedestrian traffic • Effects on parking supply • Roadway wear in the vicinity of the construction zone • Effects on public and private airports, air traffic, and military aviation
Visual Resources	• Existing landscape character and visual quality • Scenic resources within a scenic highway viewshed or a national scenic trail viewshed	• Light or glare • Applicable plans, policies, regulations, or standards for the protection and management of visual quality in the landscape
Wilderness and Recreation	• Disruption of activities at federal, State, or local recreation areas or wilderness areas	• Long-term loss or degradation of federal, State, local, or private recreational facilities or wilderness areas
Wildfire Prevention and Suppression	• Fire prevention and suppression • Wildfire risks	• Ignition potential and rate of fire spread
Electrical Interference and Hazards	• Interference with radio, television, communications, or electronic equipment • Induced currents and shock hazards	• Interference with cardiac pacemakers • Potential for structural failure due to wind or earthquake

ES.3 Choice among Alternatives

This summary provides a description of the proposed Project (Alternative 2) and alternatives. A more detailed description is provided in Chapter 2 (Description of Alternatives) of the EIR/EIS. This section also summarizes each potential alternative that was eliminated from further consideration and, therefore, was not analyzed in detail in the EIR/EIS.

Alternatives to the proposed Project were suggested by SCE in its PEA, which was submitted as part of SCE's application to the CPUC. Additional alternatives were developed by the CPUC and Forest Service

in conjunction with the team preparing the EIR/EIS. Alternatives were also suggested by public agencies and members of the public during the scoping period for the EIR/EIS (August-October 2007).

To determine the alternatives that would be analyzed in detail in this EIR/EIS, an alternatives screening process was completed between October 2007 and June 2008. The results of this process are documented in the Alternatives Screening Report provided in Appendix A. In total, the alternatives screening process resulted in the identification and screening of 29 potential alternatives. The alternatives considered included: (1) design variations to SCE's proposed Project (12 total), such as different substation sites, reduced conductor voltage (220 kV instead of 500 kV), single-circuit verses double-circuit structures, etc.; (2) minor routing adjustments to SCE's proposed route (3 total), such as re-routing Segment 10 along the Los Angeles Aqueduct; (3) entirely different transmission line routes for some segments of the proposed alignment (12 total); and (4) alternate system configurations (2 total). In addition to the 29 potential alternatives that were evaluated in the Alternatives Screening Report (Appendix A), other ideas for potential alternatives were suggested by agencies and the public during the scoping period for the EIR/EIS (August-October 2007). Many of these suggestions were conceptual and were not offered as specific alternatives, but rather as ideas to be explored.

Based on the alternatives screening process, three of the alternatives considered in the Alternatives Screening Report (Appendix A) were carried forward to be analyzed along with the No Project/Action Alternative (Alternative 1) and SCE's proposed Project (Alternative 2). These three alternatives are the West Lancaster Alternative (Alternative 3), Chino Hills Route Alternatives (Alternative 4, Routes A through D), and the Partial Underground Alternative (Alternative 5). Following completion of the Alternatives Screening Report, a new alternative was requested by the Forest Service to reduce ground disturbance within the ANF by minimizing new road construction through the use of helicopter construction, which resulted in the development of the Maximum Helicopter Construction in the ANF Alternative (Alternative 6). ~~A final alternative, t~~The 66-kV Subtransmission Alternative (Alternative 7) was also developed following the completion of the Alternatives Screening Report in response to requests from the County of Los Angeles Board of Supervisors and additional input from SCE. Finally, in response to a comment letter on the Draft EIR/EIS submitted by the City of Chino Hills, an additional route modification was considered as part of Alternative 4, which is referenced herein as Alternative 4C Modified. These seven alternatives, including the five route options considered under Alternative 4, are discussed below.

Overview of the Proposed Project and Alternatives

Below is an overview of the alternatives considered as part of this EIR/EIS. Pursuant to CEQA (Section 15126.6(a)) and NEPA (40 CFR 1505.1(e)), a reasonable range of alternatives to SCE's proposed Project (Alternative 2) were examined and were selected based on the following criteria: (1) the alternative's potential to meet most of the Project objectives/purpose and need, (2) the feasibility of the alternative, ~~and~~ (3) the alternative's ability to avoid or lessen adverse effects of SCE's proposed Project, and (4) the alternative's ability to meet CAISO/WECC/NERC reliability planning criteria. As required under CEQA Section 15126.6(e) and NEPA Section 1502.14(d), a No Project/Action alternative was also considered. The proposed Project and alternatives include the following:

Alternative 1: No Project/Action Alternative. Under the No Project/Action Alternative the Project, as proposed, would not be implemented. As such, none of the associated Project activities would occur and the environmental impacts associated specifically with the proposed Project would not occur. However, in the absence of the Project, SCE still would continue to operate and maintain the existing transmission

structures, access, and spur roads for operations and maintenance purposes under a variety of agreements (landowners) and permits (Forest Service and USACE). SCE would also be required to interconnect and integrate power generation facilities into its electric system, as required under Sections 210 and 212 of the Federal Power Act (16 U.S.C. § 824 [i] and [k]) and Sections 3.2 and 5.7 of the CAISO's Tariff. Various scenarios related to electricity generation and transmission reasonably expected to occur in the foreseeable future are identified in Chapter 2 (Description of Alternatives) of the EIR/EIS.

Alternative 2: SCE's Proposed Project. SCE's proposed Project would involve construction, operation, and maintenance of new/ upgraded transmission infrastructure along approximately 173 miles of existing and new/expanded ROW from the TWRA in southern Kern County south through Los Angeles County and the ANF and east to the existing Mira Loma Substation in Ontario, San Bernardino County, California. Invasive plant species will be controlled using manual techniques and approved herbicides within the Project area on NFS lands on the ANF. The major components of this alternative include seven segments of new/upgraded transmission line (Segments 4, 5, 6, 7, 8A/B/C, 10, and 11) and new/ upgraded substations (Segment 9).

Alternative 3: West Lancaster Alternative. This alternative would re-route the new 500-kV transmission line in Segment 4, which is currently proposed along 110th Street West, 0.5 miles farther west along 115th Street West. This alternative represents a refinement of the applicant's proposed Project that would place the transmission line along an undeveloped area instead of through development thereby minimizing disturbance to current residences or access to properties located along the paved 110th Street West. As such, land use impacts and visual impacts would be reduced.

Alternative 4: Chino Hills Alternatives. ~~Four~~ Five variations to the Chino Hills State Park alternatives considered by SCE in its PEA (RA Eliminated 6, Options 1 and 2) have been included in this analysis, as described below. These routing options have been retained for further analysis, as each would avoid proximity of the transmission line to existing residences of the City of Chino Hills; and implementation of one of these routing options would eliminate construction of approximately 16 miles of 500-kV structures along Segment 8A, ~~and eliminate construction in Segments 8B and 8C between Chino Substation and Mira Loma Substation~~between S8A MP 19.2 and 35.2. Upgrades along Segment 8B would still occur under Alternative 4, same as the proposed Project (Alternative 2).

- **Route A** would place a new double-circuit 500-kV transmission line in Segment 8A through Chino Hills State Park (CHSP) parallel to an existing double-circuit 220-kV transmission line. This alternative route would require construction of a new 500-kV switching station in CHSP, which would allow the new 500-kV transmission line to connect to existing 500-kV transmission lines located in this area that provide connections to the Mira Loma Substation.
- **Route B** represents a refinement to Route A, in which a new double-circuit 500-kV transmission line in Segment 8A would be routed completely through CHSP parallel to an existing double-circuit 220-kV transmission line. This alternative route would require construction of a new 500-kV switching station, which would be located east of and outside of the CHSP, and would allow the new double-circuit 500-kV transmission line to connect to existing 500-kV transmission lines located in this area that provide connections to the Mira Loma Substation.
- **Route C** represents a refinement to Route A, in which a new double-circuit 500-kV transmission line in Segment 8A would be placed parallel to an existing double-circuit 220-kV transmission line up to CHSP. At this point, this alternative route would turn east for approximately 2.4 miles, remaining just north of the CHSP boundary, to a new 500-kV switching station. A portion of the existing single-circuit 500-kV transmission lines within CHSP would be re-routed to tie into the new switching station, which would allow the new double-circuit 500-kV transmission line to connect to these existing 500-kV transmission lines to allow power flow to continue on to the Mira Loma Substation. In addition, a portion of the existing 220-kV

transmission line within CHSP would be re-routed outside of CHSP, paralleling the new 500-kV transmission line from just west of the CHSP boundary to the new switching station, and would then re-enter CHSP paralleling the re-routed 500-kV transmission lines to reconnect with the existing 220-kV transmission line.

- **Route C Modified** is similar to the original Route C option discussed above, with the exceptions that (1) the new gas-insulated switching station would be located on Aerojet property approximately 2,500 feet northwest of the location proposed for the original Alternative 4C, (2) transmission line configurations and access roads would be altered to account for relocation of the switching station, and (3) re-routing of the existing single-circuit 500-kV towers in CHSP to the new switching station would occur utilizing double-circuit 500-kV towers. As with the original Route C, this proposed Route 4C Modified would also diverge from the proposed Project Segment 8A at Mile 19.2, as well as re-route the existing 500-kV and 220-kV transmission lines from within CHSP, through a new switching station located north of CHSP.
- **Route D** represents a refinement to Route A, in which a new double-circuit 500-kV transmission line in Segment 8A would be placed parallel to an existing double-circuit 220-kV transmission line up to CHSP. At this point, the alternative route would turn east and proceed to follow the northern boundary of CHSP for approximately 4.2 miles, then just east of Bane Canyon the alignment would turn southeast and cut across CHSP for approximately 1.3 miles to a new 500-kV switching station located immediately east of the boundary of CHSP (same location as Alternative 4, Route B). This switching station would allow the new double-circuit 500-kV transmission line to connect to existing 500-kV transmission lines located in this area to provide connections to the Mira Loma Substation.

Alternative 5: Partial Underground Alternative. This alternative would utilize Gas-Insulated Line (GIL) technology to place the proposed overhead lines underground along Segment 8A through the City of Chino Hills for approximately 3.5 miles to reduce significant visual impacts and address other community concerns.

Alternative 6: Maximum Helicopter Construction in the ANF Alternative. This alternative would utilize helicopter construction within the ANF to the maximum extent feasible. This alternative was requested by the Forest Service to reduce ground disturbance within the ANF by minimizing new road construction through the use of helicopter construction. Helicopter staging/support areas have been identified in the vicinity of Segments 6 and 11 to provide for helicopter construction activities within the ANF. A total of 148~~3~~ new 500-kV towers would be constructed by helicopter under this alternative: 928~~7~~ along Segment 6 and 56 along Segment 11. As with the proposed Project, Alternative 6 would traverse approximately 42 miles of NFS lands in the ANF and approximately 6.4 miles of lands that are owned by the USACE. Invasive plant species will be surveyed for and controlled using manual techniques and approved herbicides within the Project area on NFS lands.

Alternative 7: 66-kV Subtransmission Alternative. This alternative is comprised of four~~three~~ 66-kV subtransmission line elements, including the following: (1) Undergrounding the existing 66-kV subtransmission line on Segment 7 through the River Commons at the Duck Farm Project (Duck Farm Project) between MP 8.9 and MP 9.9 of Segment 7, in the planned Duck Farm Project area as requested by the Board of Supervisors County of Los Angeles to minimize the Project's effects to passive recreation opportunities in the planned Duck Farm project area; (2) Re-routing and undergrounding the existing 66-kV subtransmission line around the Whittier Narrows Recreation area along Segment 7 (S7 MP 11.4 to 12.025) to provide habitat enhancement for least Bell's vireos as identified by SCE; ~~and~~ (3) Re-routing the existing 66-kV subtransmission line through ~~around~~ the Whittier Narrows Recreation Area in~~along~~ Segment 7 (S7 MP 12.0 to 13.6) immediately north of the existing 220-kV ROW to reduce the number of structures required (20-foot expanded ROW required); (4) Re-routing the existing 66-kV subtransmission line around the Whittier Narrows Recreation Area along Segment 8A between the San Gabriel Junction at MP 2.2 and S8A MP 3.8 (2 routing options are provided in this area)~~8A~~ to provide habitat enhancement for least Bell's vireos as identified by SCE. As with the proposed Project, Alternative 7 would traverse 42

miles of NFS lands in the ANF; however, this alternative would also traverse roughly 7.9 miles of lands that are owned by the USACE, which is approximately 1.5 miles more USACE lands than the proposed Project or other Project alternatives.

CEQA Environmentally Superior Alternative

For the purposes of CEQA, the CPUC has determined that the environmentally superior alternative, as described in Section 4.3.1 of the EIR/EIS, is a combination of Alternative 2 (SCE's Proposed Project), Alternative 3 (West Lancaster), Alternative 6 (Maximum Helicopter Construction in the ANF), and Alternative 7 (66-kV Subtransmission) within Segment 7 (Duck Farm 66-kV Underground, Whittier Narrows 66-kV Underground Re-Route, and Whittier Narrows 66-kV Overhead Re-Route) and within Segment 8 between S8A MP 2.2 to 3.8 (Whittier Narrows 66-kV Overhead Re-Route – Option 1). Within the ANF (Segment 6 and the northern portion of Segment 11), the Forest Service will need to determine the specific combination of Alternative 2 and Alternative 6 features that provides the least overall impact to Forest resources (see the NEPA Preferred Alternative below). This is basically a decision as to which transmission structures would best be demolished and constructed by helicopter versus by conventional ground-based construction methods.

NEPA Preferred Alternative

The NEPA preferred alternative, as identified by the Forest Service, is a combination of Alternative 2 and Alternative 6, as discussed in Chapter 4 (Section 4.3.2). No new or greater impacts would be introduced as a result of this hybrid alternative, as it: (1) is based on two alternatives whose impacts have been fully analyzed in the EIR/EIS, and the change in impact magnitude would fall within the range identified for these two alternatives; and (2) would result only in a difference in the construction method utilized for removal and construction of the new transmission structures (ground-based construction versus helicopter construction).

ES.4 Major Conclusions

Construction of the TRTP would result in a number of temporary impacts that would cease upon completion of the construction phase. Such impacts include a temporary reduction of agricultural productivity in the Project area; loss of native vegetation as a result of its direct removal during construction activities, and impacts to wildlife from clearing, grading, and helicopter noise; water quality and geology impacts from erosion and sedimentation during construction; disruptions to existing utility systems; and traffic impacts from increased congestion and disruption to transit routes. As discussed in Sections 3.2, through 3.17 of the EIR/EIS, these impacts would be less than significant without mitigation (Class III) or would be reduced to less than significant with mitigation (Class II).

Significant and unavoidable impacts (Class I) associated with Project construction, operation, and maintenance are summarized in Section ES.4.1, below. Significant impacts that can be reduced to less-than-significant levels with mitigation (Class II) are summarized in Section ES.4.2. For descriptions of less-than-significant impacts that do not require mitigation (Class III), see Sections 3.2 through 3.17 of the EIR/EIS.

ES.4.1 Significant and Unavoidable Impacts (Class I)

Significant direct and indirect impacts (Class I) resulting from the proposed Project and alternatives are summarized below. Cumulative impacts are also presented; however the discussion is limited to the

summary presented in Table ES-3 below. Refer to Sections 3.2 through 3.17 of the EIR/EIS for a complete description of these impacts.

ES.4.1.1 Air Quality

As described in Section 3.3 (Air Quality), construction of the proposed Project and alternatives would result in short-term impacts to ambient air quality. Daily construction emissions from the proposed Project and alternatives, including nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOC), particulate matter (PM10) and fine particulate matter (PM2.5), even after implementation of all feasible mitigation measures, would remain above the South Coast Air Quality Management District (SCAQMD) daily significance thresholds and the Antelope Valley Air Quality Management District (AVAQMD) daily significance thresholds (except for PM2.5 where there is no threshold recommended by AVAQMD). In addition, the NOx, and PM10 emissions from the proposed Project and alternatives would remain above the Kern County Air Pollution Control District (KCAPCD)~~Antelope Valley Air Quality Management District (AVAQMD)~~ daily significance threshold values. Therefore, the daily regional emissions from the proposed Project and alternatives would cause significant and unavoidable temporary impacts to air quality in these two jurisdictions.

There are many areas along the proposed Project and alternative routes where construction would be located near residences, schools, or other sensitive receptors. Construction of the proposed Project and alternatives would cause localized emissions above the SCAQMD Localized Significance Threshold (LST) values even after mitigating to the maximum extent feasible; therefore, construction of the proposed Project and alternatives would have a significant and unavoidable temporary impact on local sensitive receptors.

~~ES.4.1.2 Biological Resources~~

~~As described in Section 3.4 (Biological Resources), impacts to vegetation and wildlife may occur in a variety of ways. Clearing and grading associated with the placement of transmission structures, construction of helicopter staging areas, and the construction and widening of access and spur roads may result in the alteration of soil conditions, including the loss of native seed banks and changes to the topography and drainage of a site such that the capability of the habitat to support native vegetation would be impaired. Construction would affect wildlife in adjacent habitats by interfering with breeding or foraging activities and movement patterns, causing animals to temporarily avoid areas adjacent to the construction zone.~~

~~Due to the narrow area of disturbance along the Project route and the short duration of disturbance, many common wildlife species occurring along the transmission line corridors are expected to quickly re-colonize the area after construction activities have been completed. However, re-colonization rates depend on the rate of revegetation at each disturbed site, with slower wildlife re-colonization in vegetation communities that are difficult to restore and slow to recover from disturbance. The use of access roads would also result in the temporary decline of species in the immediate vicinity of the road; however, the effects of traffic are typically short term in duration and vehicle speeds would be limited. Project related effects would be minimized through the implementation of mitigation measures described in Section 3.4 (Biological Resources) that are designed to educate workers of the presence and sensitivity of wildlife that may occur in the Project area; limit the work that may occur in Riparian Conservation Areas (RCAs); reduce the effect of fugitive dust on adjacent areas through dust control and reduced vehicle traffic; restore habitat at the conclusion of construction; and control for noxious weeds.~~

ES.4.1.2~~3~~ Cultural Resources

As described in Section 3.5 (Cultural Resources), direct impacts from the proposed Project and alternatives may be avoided through minor design modifications, and Project effects would be reduced to a less-than-significant level by avoidance and protection measures. However, it is important to note that if direct impacts to National Register of Historic Places (NRHP) properties eligible under Criterion d (significant data potential) are unavoidable, mitigation through data recovery would reduce impacts, but, under the National Historic Preservation Act (NHPA) regulations, effects would still be considered adverse (Class I). Likewise, for~~if~~ properties eligible for the NRHP under Criteria a, b, or c, application of mitigation measures may~~data recovery could~~ not reduce impacts to a less-than-significant level, and~~then~~ effects still would be considered adverse (Class I). ~~In addition, exposure of unanticipated Native American human remains or sacred features during construction of the proposed Project and alternatives would be a significant and unavoidable impact to the remains and an adverse effect under the regulations in the NHPA. Implementation of mitigation measures would reduce the severity of impacts to the extent feasible, but would not reduce impacts to a less than significant level.~~

ES.4.1.3~~4~~ Land Use

As described in Section 3.9 (Land Use), construction of the proposed Project and all alternatives except Alternatives 4 and 5 would result in impacts that either would not be significant and would not require mitigation (Class III) or would be reduced to a less-than-significant level with implementation of recommended mitigation measures (Class II).

Alternative 4

As described in Section 3.9 (Land Use), Routes A, B, C, C Modified, and D of Alternative 4 would traverse non-residential lands used for grazing, Chino Hills State Park (Park), and open space (undeveloped) lands east of the Park. During construction, these routes would temporarily disrupt, displace, or preclude operational and maintenance activities within the Park. Although Route B traverses the greatest distance within the Park and Route A would involve a new switching station within the Park, it would be anticipated that construction-related activities associated with Route C would be of a similar or perhaps greater duration than Routes A and B because it would involve the dismantling and re-construction (re-routing) of two sets of transmission towers (single-circuit 500-kV and double-circuit 220-kV) within the Park. Construction-related impacts to non-residential land uses under Route C Modified would be nearly identical to those under the original Route C. In comparison to Routes A, B and D, both the original Route C and Route C Modified would be expected to result in construction-related impacts that occur for longer period of time because they would involve the dismantling and re-construction (re-routing) of three existing transmission lines within the Park. The implementation of Land Use mitigation measures, in conjunction with the mitigation measures provided in the following resource/issue areas: Air Quality, Noise, Traffic and Transportation, Biological Resources, and Wilderness and Recreation, would lessen construction-related impacts within the Park, but it is not anticipated that these mitigation measures would reduce impacts to a less-than-significant level and, as a result, impacts would be significant and unavoidable.

Alternative 4 would require the expansion of ROW within Chino Hills State Park. The use of Park land for transmission purposes is anticipated to cause long-term conflicts with, and disruptions of, existing uses and operations within the Park. Additionally, the placement of these features is anticipated to conflict with

the Park's management of affected Natural Open Space and Core Habitat Zones. These impacts would be significant and unavoidable.

Implementation of Alternative 4 would not be consistent with the Chino Hills State Park General Plan. In order to achieve consistency, the Chino Hills State Park General Plan would need to be amended. The amendment would subsequently require approval by the State Parks and Recreation Commission. Therefore, the existing inconsistency between Alternative 4 and the Chino Hills State Park General Plan would be considered a significant and unavoidable impact.

Alternative 5

As discussed in Section 3.9 (Land Use), there are commercial and services uses adjacent to both sides of the ROW along Alternative 5. To accommodate the Eastern Transition Station, the existing ROW north of an existing flood control channel would need to be expanded by 100 feet, for a total ROW width of 250 feet. The expanded ROW and construction of the Eastern Transition Station would require the removal of a commercial car wash, a retail business, and a portion of a parking lot. Although it is assumed that SCE would make all efforts to purchase the property needed for construction of the Eastern Transition Station, it is feasible that the owner (or owners) of both the property and the affected businesses would not agree to, or be willing to negotiate, SCE's proposed acquisition agreement (or agreements). Under this scenario, implementation of Alternative 5 would likely require that the CPUC exercise eminent domain. The take of the property and businesses affected by Alternative 5 through eminent domain would be considered a significant and unavoidable impact.

ES.4.1.4~~5~~ Noise

As described in Section 3.10 (Noise), construction noise from the proposed Project and alternatives would substantially increase ambient noise conditions for sensitive receptors and increase noise levels within 200 feet of construction activities along the proposed Project and alternative ROWs. During construction, noise levels would violate local standards. Although construction noise would be temporary and would be reduced by implementation of applicant-proposed measures (APMs) and mitigation measures, significant construction-related noise impacts cannot be reduced to a less-than-significant level.

Permanent noise levels along the ROW would increase due to corona noise from operation of the transmission lines and substations in the vicinity of sensitive receptors. Corona noise generated by the proposed Project and alternatives would not be in compliance with noise standards of Los Angeles County, and the Cities of Chino, Monterey Park, and Whittier. Since no feasible mitigation exists to reduce or eliminate the corona noise that would be generated by the proposed Project or alternatives, the increase in corona noise levels would result in a significant and unavoidable impact.

ES.4.1.5~~6~~ Visual Resources

Section 3.14~~6~~ (Visual Resources) states that short-term visual impacts on landscape character and visual quality of landscape views as seen from various vantage points due to construction of the proposed Project and alternatives would be significant and unavoidable. There are no mitigation measures available to make vehicles, heavy equipment, helicopters, and other related components less visible during construction.

There is no mitigation available to make new transmission lines disappear or become inconspicuous as seen from the numerous vantage points from which the proposed Project and alternatives would be visible. The presence of new transmission line structures, conductors, access and spur roads, and new ROWs in landscapes that currently have no transmission line facilities would result in a significant and

unavoidable adverse visual impact. However, the majority of the Project area would not experience this level of visual impact since structures already exist in many of the corridors, although impacts may still be considered significant due to the increase in structure size compared to the existing structures.

ES.4.1.6~~7~~ Wildfire Prevention and Suppression

As described in Section 3.16~~5~~ (Wildfire Prevention and Suppression), the presence of the rerouted portion of Alternative 4 would incrementally increase the likelihood of a wildfire in fire-prone areas along the transmission ROW where new or expanded transmission line would be constructed. Mitigation measures would reduce the risk of vegetation contact with conductors, the likelihood of component failures that could result in wildfire ignitions, and the potential damage to homes from Project-related wildfires. However, the creation of defensible fuelbreaks, which would be required to comply with Mitigation Measure F-5, ~~space~~ would not guarantee structure protection during severe fire weather, and the potential for the re-routed portion of Alternative 4 ~~Project~~ to ignite a wildfire would remain significant overall. Although mitigation measures would reduce the risk of fire ignition and the potential for damage to homes from Project-related wildfires, the potential to ignite a fire and cause damage to homes would still exist and remain significant and unavoidable.

The major findings of the EIR/EIS analysis are summarized below in Table ES-3 (Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures) according to issue/resource area, along with a summary of the significant impacts that would be expected from the construction and operation of the proposed Project and alternatives.

ES.4.2 Less than Significant Impacts with Mitigation (Class II)

Impacts of the proposed Project and alternatives that would be less than significant after implementation of recommended mitigation measures (Class II) are summarized below. The mitigation measures that would be required to reduce impacts to less-than-significant levels are identified and described in Sections 3.2 through 3.17 of the EIR/EIS. In addition, Table ES-3 (Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures) provides a summary of all identified Project impacts and associated mitigation measures.

Agricultural Resources. Construction, operation, and maintenance of the proposed Project and each of the alternatives would result in the conversion of Farmland to non-agricultural uses and would interfere with agricultural operations in some areas.

Air Quality. The significant and unavoidable (Class I) Air Quality impacts are summarized above in Section ES.4.1. In addition to these impacts, construction of the Project or an alternative would result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements (Alternative 6 only), the air quality provisions of the Angeles National Forest Strategy, and other applicable air quality management plans in the Project area. A complete General Conformity analysis will be performed on the selected Project alternative, as required by statute, and approved before the Record of Decision (ROD) is approved for this Project. An overview of General Conformity is presented in Section 3.3 (Air Quality).

Biological Resources. ~~The significant and unavoidable (Class I) Biological Resources impacts are summarized above in Section ES.4.1.~~ Construction of the proposed Project or an alternative would have the potential to result in the following impacts to riparian or sensitive natural communities: loss of native vegetation, loss of desert wash, spread of noxious weeds, wildlife disturbance and mortality, loss of

nesting birds or raptors, and loss of foraging habitat. The following impacts to endangered or threatened species and/or proposed or critical habitat would also occur under the proposed Project and alternatives: loss of arroyo toad (this would not occur under Alternative 6) and critical habitat for the coastal California gnatcatcher. Other~~;~~ potential effects to listed species include loss of California red-legged frog, mountain yellow-legged frog, desert tortoise, unarmored threespine stickleback, Santa Ana sucker, California condor, and California gnatcatcher; disturbance of nesting southwestern willow flycatchers, least Bell's vireo, yellow-billed cuckoos and/or their habitat; disturbance to nesting Swainson's hawks and/or loss of foraging habitat for Swainson's hawks; and electrocution of State and/or federally protected birds. Additionally, effects on candidate, sensitive, or special-status species ~~w~~could include the following: loss of plant species; mortality or injury of and loss of nesting habitat for southwestern pond turtles, two-striped garter snakes, south coast garter snakes, Coast Range newts, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species; disturbance of wintering mountain plovers; loss of occupied burrowing owl habitat and California spotted owl habitat; disturbance of nesting ~~California spotted owls and other~~ avian species of concern and special-status bat species (including as a result of transmission line strikes); and mortality and loss of habitat of San Diego desert woodrats, ringtails, and American badgers. Project effects on federally protected wetlands ~~w~~could include loss of wetlands. Finally, Project interference with native fish or wildlife movements, corridors, or nursery sites ~~w~~could include impedance of desert tortoise movement as a result of habitat modification, as well as potential impacts to Management Indicator Species.

Cultural Resources. The significant and unavoidable (Class I) Cultural Resources impacts are summarized above in Section ES.4.1. Construction of the proposed Project or an alternative would affect historic properties by diminishing the integrity of properties eligible for inclusion in the National Register of Historic Places (NRHP). In addition, Project activities would result in adverse changes to the significance of historical resources by diminishing the integrity of properties eligible for inclusion in the California Register of Historical Resources (CRHR). Furthermore, Native American human remains or sacred features could be inadvertently uncovered, exposed, and/or otherwise damaged during construction.

Environmental Contamination and Hazards. Excavation or grading during construction of the Project or an alternative could result in the following scenarios: mobilization of existing soil or groundwater contamination from known sites; explosions or exposure of workers to toxic gases as a result of encountering landfill gas and/or natural gas located near active, inactive, or abandoned oil wells; and disturbance of unanticipated preexisting soil and/or groundwater contamination.

Geology, Soils, and Paleontology. Activities associated with construction of the proposed Project or an alternative could interfere with access to known energy resources. Such activities could also trigger or accelerate geologic processes such as erosion, slope instability, and landslides. In addition, exposure to potential risk of loss or injury from earthquake-related ground rupture could occur if Project structures are damaged by surface fault rupture at crossings of active faults. Project structures could also be damaged as a result of seismically-induced groundshaking, problematic soils, landslides, earth flows, and/or debris slides, thereby exposing people or structures to hazards.

Hydrology and Water Quality. Construction of the proposed Project or an alternative would have the potential to degrade surface and/or groundwater quality through erosion and sedimentation (Alternatives 2 through 7), accidental release of hazardous materials (Alternatives 2 through 7), and/or discharge of contaminated groundwater during dewatering operations (Alternatives 5 and 7~~ only~~). In addition, the

placement of Project structures may result in flood-related damage as a result of impeding flood flows, and may be inundated by mudflow during Project operation.

Land Use. The significant and unavoidable (Class I) Land Use impacts are summarized above in Section ES.4.1. Construction of the proposed Project or an alternative would temporarily disrupt, displace, or preclude existing residential land uses (Alternatives 2 through 7), and non-residential land uses (Class I for Alternatives 4 and 5). Operation and maintenance would result in long-term disruption of existing and planned non-residential land uses (Class I for Alternatives 4 and 5), and would conflict with relevant federal, State, or local land use plans, goals, and/or policies (Class I for Alternative 4).

Public Services and Utilities. Construction of the proposed Project or an alternative may require emergency services if a construction-related accident occurs. Access of emergency response vehicles may be impeded by temporary lane closures during the construction period. Utility systems and public works maintenance yards would be temporarily disrupted during the construction period.

~~Additionally, the amount of waste material generated during construction may not be recycled in compliance with all federal, State, and/or local laws, regulations, and standards relating to solid waste.~~

Traffic and Transportation. Construction of the proposed Project or an alternative could result in the following: substantial congestion due to road and/or lane closures; temporary interference with emergency response; temporary disruption of transit routes, rail traffic or operations, and pedestrian / bicycle traffic; localized shortages of public parking; conflicts with planned transportation projects; introduction of aviation hazards (transmission structures); and temporary restrictions on property access as a result of underground construction activities (Alternative 7 only).

Visual Resources. The significant and unavoidable (Class I) Visual Resources impacts are summarized above in Section ES.4.1. Installation of transmission structures associated with the proposed Project and the alternatives would potentially result in sunlight reflection and glare under certain lighting conditions. In addition, the Project would contribute to the long-term loss or degradation of a scenic highway viewshed and/or scenic trail viewshed as a result of installing permanent features including transmission structures.

Wilderness and Recreation. Construction, operation, and maintenance of the proposed Project or an alternative would have the potential to restrict access to or disrupt activities associated with established recreational resources and/or opportunities. Construction activities under Alternative 6 would have the potential to contribute to the degradation of the "solitude and unconfined recreation" characteristic of the designated San Gabriel Wilderness Area. In addition, construction of the proposed Project and alternatives would contribute to the degradation of the "backcountry experience" along several portions of the Pacific Crest National Scenic Trail. Project activities, particularly related to road improvements, would have the potential to degrade Off-Highway Vehicle opportunities and facilitate unmanaged recreation in the ANF.

Wildfire Prevention and Suppression. The significant and unavoidable (Class I) impacts related to Wildfire Prevention and Suppression, specifically related to the rerouted portion of Alternative 4, are summarized above in Section ES.4.1. Construction and/or maintenance activities under the proposed Project and alternatives would have the potential to reduce the effectiveness of firefighting, increase the risk of wildfire, and increase the risk of personnel injury or death in the event of a fire. In addition, Project activities would introduce non-native plants, which would contribute to increased ignition potential and rate of fire spread, in the event of a fire.

Electrical Interference and Hazards. Construction, operation, and maintenance of the proposed Project or an alternative would have the potential to result in the following: electrical interference with radio, television, communications, and/or electronic equipment, as well as induced currents and shock hazards in joint use corridors.

As mentioned, Table ES-3 (Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures), which is presented below, provides a summary of all identified Project impacts and associated mitigation measures.

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
Agricultural Resources					
Convert Farmland to non-agricultural use (Criterion AG1)	Construction activities would temporarily preclude the agricultural use of some Farmland~~Construction activities would result in temporary and permanent impacts to Farmland~~. (Impact AG-1)	Class II[4]	Construction of residential and urban development projects would result in substantial areas of Farmland converted to non-agricultural uses. This impact is considered cumulatively considerable[5].	Class I	AG-1: Coordinate construction activities with agricultural landowners
	Operation would permanently convert Farmland to non-agricultural use. (Impact AG-2)	Class III	The area of land that would be permanently converted for the proposed Project would potentially combine with similar impacts of other projects and, therefore, would be considered cumulatively considerable.~~This impact is considered cumulatively considerable.~~	Class I	Not Available
Interfere with agricultural operations (Criterion AG2)	Construction activities would interfere with agricultural operations. (Impact AG-3)	Class II	Construction of residential and urban development projects would disrupt agricultural operations both through the disruption of agricultural land as well as through construction activities on and adjacent to agricultural lands. This impact is considered cumulatively considerable.	Class I	AG-1
	Operation would interfere with agricultural operations. (Impact AG-4)	Class II	The operation of the proposed Project across agricultural land would interfere with agricultural operations. This impact combined with the effects of the operation of other planned projects on agricultural operations is considered cumulatively considerable.	Class I	AG-1
Air Quality					
Emissions of air pollutants would exceed any SCAQMD, AVAQMD, or KCAPCD regional air quality standard (Criterion AIR1)	Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds. (Impact AQ-1)	Class I	Emissions from reasonably foreseeable projects occurring ~~In the event that any currently unknown projects would be constructed~~ concurrently with TRTP in the SCAQMD, KCAPCD, and AVAQMD jurisdictions ~~then the proposed Project~~ would have cumulatively significant impacts in those jurisdictions.	Class I	AQ-1a: Implement Construction Fugitive Dust Control Plan. AQ-1b: Off-road Diesel-fueled Equipment Standards. AQ-1c: Limit Vehicle Traffic and Equipment Use. AQ-1d: Heavy Duty Diesel Haul Vehicle On-road Equipment Standards. AQ-1e: On-road Vehicles Standards. AQ-1f: Properly Maintain Mechanical Equipment. AQ-1g: Restrict Engine Idling to 5 Minutes. AQ-1h: Schedule Deliveries Outside of Peak Traffic Hours. AQ-1i: Off-road Gasoline-fueled Equipment Standards. AQ-1j: Reduction of Helicopter Emissions. AQ-1k: Waste Soil Trip Distance Minimization (Alt 4C Modified only) AQ-1l: Waste Soil Truck Capacity (Alt 4C Modified only) AQ-1m: Tunnel Waste Trip Distance Minimization (Alt 5 only) AQ-1n: Tunnel Waste Truck Capacity (Alt 5 only)
	Operating emissions would exceed the SCAQMD, AVAQMD, and KCAPCD regional emission thresholds. (Impact AQ-2)	Class IV	The proposed Project's operation will have a net emission decrease, so it will not contribute to regional emissions and would have a less-than-significant cumulative regional impact.	Class III	None recommended
SCAQMD Localized Significance Thresholds (Criterion AIR2)	Construction of the Project would expose sensitive receptors to substantial pollutant concentrations. (Impact AQ-3)	Class I	For the emissions of any two projects to have the potential for significant cumulative downwind concentrations, they must both be in close proximity to limit the downwind dispersion from one site to the other and generally one of the projects must be able to cause an air quality standard exceedance on its own. It can be assumed that the potential for cumulative impacts to sensitive receptors is the same as the Project impacts to sensitive receptors, so the proposed Project would have cumulative significant impacts to sensitive receptors.~~Would result in cumulatively significant impacts to sensitive receptors after mitigation.~~	Class I	AQ-1a to AQ-1j
	Operation of the Project would expose sensitive receptors to substantial pollutant concentrations. (Impact AQ-4)	Class III	Since the proposed Project's operation will have minimum direct localized operating emissions and the project will help create an overall net emission decrease, it will have a less-than-significant cumulative localized impact to sensitive receptors~~Less-than-significant cumulative localized impact to sensitive receptors.~~	Class III	None recommended

[2] Unless otherwise indicated, significance determinations are applicable to all alternatives.
[3] Unless otherwise indicated, cumulative significance determinations are applicable to all alternatives except the No Project/Action Alternative (Alternative 1).
[4] Class I: Significant impact; cannot be mitigated to a level that is less than significant; Class II: Significant impact; can be mitigated to a level that is less than significant; Class III: Adverse impact; less than significant; and Class IV: Beneficial impact.
[5] "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
Toxic air contaminant emissions would exceed SCAQMD risk thresholds. (Criterion AIR3)	Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds. (Impact AQ-5)	Class III	The cumulative projects construction would not be expected to have significant emissions of toxic air contaminants, and would not have the potential to cumulatively exceed SCAQMD risk thresholds. Given the temporary nature and low toxic air contaminant emission level for the proposed Project's and cumulative projects, the proposed Project would have a less-than-significant cumulative health risk~~Less than-significant cumulative health risk.~~	Class III	None recommended
Result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements. (Criterion AIR 4)	The Project would not conform to Federal General Conformity Rules. (Impact AQ-6)	Class III (Alts. 2, 3, 4, 5,7) Class II (Alt 6 only)	This impact is strictly applicable to single project evaluation. Therefore, cumulative impacts would not occur.	No Impact	AQ-6: General Conformity Emission Offset Mitigation (Alt 6 Only)
Expose a substantial number of people to objectionable odors. (Criterion AIR5)	The Project would create objectionable odors. (Impact AQ-7)	Class III	Given the temporary nature and relative mildness of the Project's construction odors, odor impacts related to the proposed Project would be adverse but not cumulatively significant.~~Odor impacts Would not be cumulatively significant~~	Class III	None recommended
Conflict with air quality provisions of the Angeles National Forest Strategy. (Criterion AIR 6)	The Project would not conform to Angeles National Forest air quality strategies. (Impact AQ-8)	Class II	This impact is strictly applicable to single project evaluation. Therefore, cumulative impacts would not occur.	No Impact	AQ-1a to AQ-1j
Inconsistent with the current approved Air Quality Management Plans. (Criterion AIR 7)	The Project would not conform with Applicable Air Quality Management Plans. (Impact AQ-9)	Class II	This impact is strictly applicable to single project evaluation. Therefore, cumulative impacts would not occur	No Impact	AQ-1a, AQ-1b, and AQ-1d
Greenhouse gas emissions (Criterion AIR 8)	Emissions would contribute to climate change. (Impact AQ-10)	Class IV	The Project will allow a reduction in GHG emissions from electricity generation resulting in beneficial impacts and would not result in impacts that would be cumulatively considerable.	No Impact	None recommended
Biological Resources					
Impacts to riparian or ~~sensitive~~ natural communities (Criterion BIO1)	Construction activities would result in temporary and permanent losses of native vegetation. (Impact B-1)	Class II	Due to the historic and ongoing loss of native vegetation communities region-wide, the impacts to native vegetation have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable~~The impacts to native vegetation would be considered cumulatively significant and unavoidable.~~	Class I	B-1a: Provide restoration/compensation for impacts to native vegetation communities B-1b: Implement a Worker Environmental Awareness Program B-1c: Treat cut tree stumps with Sporax AQ-1a: Implement Construction Fugitive Dust Control Plan H-1a: Implementation of an Erosion Control Plan and demonstrate compliance with water quality permits
	The Project would result in L~~l~~oss of sensitive desert wash or riparian habitat. (Impact B-2)	Class II	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact would reduce and/or degrade desert wash and riparian habitat types that are limited in distribution within southern California. Impacts ~~The impacts to sensitive desert wash and riparian habitat types~~ would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-1b, AQ-1a, H-1a B-2: Implement RCA Treatment Plan
	The Project would result in the ~~E~~establishment and spread of noxious weeds. (Impact B-3)	Class II	The spread of existing weeds or the introduction of new weed populations is a significant Project impact and would also contribute to the cumulative spread of weeds when combined with weed population establishment and spread occurring from other past and reasonably foreseeable projects. The introduction and spread of noxious weeds would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-2 B-3a: Prepare and implement a Weed Control Plan B-3b: Remove weed seed sources from construction access routes B-3c: Remove weed seed sources from assembly yards/staging areas, tower pads, pull sites, landing zones, and spur roads
	Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and result in wildlife mortality. (Impact B-4)	Class II	The Project would result in disturbance to wildlife and wildlife mortality during construction activities. Past and foreseeable future actions in these areas would also result in considerable disturbance to wildlife, especially common species. Impacts w~~W~~ould be potentially adverse and cumulatively considerable.	Class I	B-1a, B-1b, B-2, B-3a, AQ-1a, H-1a
	Construction activities conducted during the breeding season ~~w~~could result in the loss of nesting birds or raptors. (Impact B-5)	Class II	Significant because the impact substantially reduces the acreage of several habitat types that are important for nesting birds and limited in distribution in Southern California, such as riparian habitats.	Class I	B-1a, B-1b, B-3a, AQ-1a B-5: Conduct pre-construction surveys and monitoring for breeding birds
	The Project would cause L~~l~~oss of foraging habitat for wildlife. (Impact B-6)	Class II	Would be significant, because the impact substantially reduces the acreage of several habitat types that are important for wildlife and limited in distribution in southern California.	Class I	B-1a, B-1b, B-2, B-3a, AQ-1a, H-1a

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
Impacts to endangered or threatened species, or proposed or Designated critical habitat (Criterion BIO2)	The Project could ~~D~~disturb~~ance of~~ endangered, threatened, or proposed plant species or their habitat. (Impact B-7)	Class II	Would be significant, because the impact substantially reduces the acreage of suitable habitat for multiple candidate, sensitive, and special-status plants in the region.	Class I	B-1a, B-1b, B-3a, AQ-1a, H-1a B-7: Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.~~protocol surveys for rare plants and avoid populations of listed plants~~
	The Project could result in the ~~L~~loss of California red-legged frogs and mountain yellow-legged frogs. (Impact B-8)	Class II	Impacts would be cumulatively considerable because past actions and natural events have so severely impacted California red-legged frog and mountain yellow-legged frog populations that both species are now at the brink of extirpation in Southern California.	Class I	B-1a, B-1b, B-2, B-3a, AQ-1a, H-1a B-8a: Conduct protocol surveys for California red-legged frogs and implement avoidance measures B-8b: Conduct biological monitoring H-1b: Dry weather construction
	The Project would result in the ~~L~~loss of arroyo toads. (Impact B-9)	Class II	Other projects that would have the potential to disturb arroyo toads or their habitat in the project area would be subject to analysis under Section 7 of the ESA and would include mitigation similar to that proposed for the TRTP. Therefore, the incremental effects to arroyo toads from the proposed Project and other projects in the area would be minimized and would be less than cumulatively considerable~~Would be cumulatively considerable.~~	Class III	B-1a, B-1b, B-2, B-3a, B-8b, AQ-1a, H-1a, H-1b B-9: Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas
	The Project could result in the ~~L~~loss of desert tortoises. (Impact B-10)	Class II	Project impacts, should they occur, would contribute substantially to the incremental take of, and loss of habitat for, desert tortoises when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.~~Impacts would be cumulatively considerable.~~	Class I	B-1a, B-1b, B-3a, AQ-1a B-10: Conduct presence or absence surveys for desert tortoise, preserve habitat, and implement avoidance measures.~~protocol surveys for desert tortoise and implement avoidance measures~~
	The Project could result in the ~~M~~mortality of desert tortoises as a result of increased predation by common ravens. (Impact B-11)	Class III	A significant increase in cumulative predation of the desert tortoise, if present, by common ravens is not expected.	Class III	None recommended
	The Project could result in the ~~L~~loss of special-status fish. (Impact B-12)	Class II	Project effects to the Big Tujunga population are not expected; however, the Santa Ana sucker is present along the proposed West Fork Cogswell road. Impacts to special-status fish species or their habitat would be cumulatively significant and unavoidable.	Class I ~~(No Impact under Alt. 6)~~	B-1a, B-1b, B-2, B-3a, B-8b, H-1a, H-1b B-12: Implement avoidance and minimization measures for Santa Ana sucker~~fish~~ and other aquatic organisms
	The Project could result in the ~~L~~loss of critical habitat for the Santa Ana sucker. (Impact B-13)	Class II (No Impact under Alt. 6)	Other projects that would have the potential to impact Santa Ana sucker critical habitat in the Project area would be required to be mitigated similar to the proposed Project as they would occur on federal lands under the jurisdiction of the FS. Therefore, cumulative impacts to Santa Ana sucker critical habitat would be less than significant~~Impacts to Santa Ana sucker would be cumulatively significant.~~	Class III (No Impact under Alt. 6)	B-1a, B-1b, B-2, B-3a, B-8b, H-1a, H-1b, B-12
	The Project could result in the ~~L~~loss of California condors. (Impact B-14)	Class II	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities have the potential to impact and result in the loss of California condors. Therefore, ~~i~~Impacts to California condors would be cumulatively significant.	Class I	B-1a, B-1b, B-2, B-3a, B-8b B-14: Monitor construction in condor habitat and ~~R~~remove trash and micro-trash from the work area daily
	The Project would ~~D~~disturb~~ance of~~ nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat. (Impact B-15)	Class II	The combined effect of the proposed Project with other past projects and future projects would be significant, because their impact increases the level of disturbance to least Bell's vireos within the project area. Disturbance to southwestern willow flycatchers and yellow-billed cuckoos, if present, would also occur in riparian areas of the proposed Project and would combine with the effects of other projects in the area.	Class I	B-1a, B-1b, B-2, B-3a, B-5, AQ-1a, H-1a B-15: Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat
	The Project would result in the ~~L~~loss of coastal California gnatcatchers. (Impact B-16)	Class II	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the combined impacts substantially reduce the acreage of suitable habitat in the region. Further, disturbance to California gnatcatchers due to construction activities for this and other cumulative projects would be significant. ~~The impacts to coastal California gnatcatchers would be considered cumulatively significant and unavoidable.~~	Class I	B-1b, AQ-1a B-16: Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures
	The Project would result in the ~~L~~loss of critical and/or occupied habitat of the coastal California gnatcatcher. (Impact B-17)	Class II	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact may considerably reduce the acreage of critical or occupied habitat in the region. The impacts to coastal California gnatcatcher habitat would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-3a, B-16, AQ-1a B-17: Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
	The Project could result in the ~~D~~disturbance to nesting Swainson's hawks. (Impact B-18)	Class II	Impacts of the Project to nesting Swainson's hawks have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable.	Class I	B-1b, AQ-1a B-18a: Conduct pre-construction surveys for Swainson's hawks B-18b: Removal of nest trees for Swainson's hawks
	The Project would result in the ~~L~~loss of foraging habitat for Swainson's hawks. (Impact B-19)	Class II	Impacts of the Project to Swainson's hawk foraging habitat have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-3a, B-18a, AQ-1a B-19: Compensate for loss of foraging habitat for Swainson's hawks
	The Project could result in the ~~E~~electrocution of State and/or federally protected birds. (Impact B-20)	Class III	Large, aerial-perching birds such as hawks and eagles are most susceptible to electrocution from power lines; however, the elements of a 500-kV or 220-kV line are spaced far enough apart that even the largest raptors are unlikely to be electrocuted. However, to further reduce such the potential for mortality events, SCE will implement APMs BIO-4 and BIO-9 as part of the Project (in accordance with the *Suggested Practices for Raptor Protection on Power Lines and Avian Protection Plan Guidelines*). The cumulative impacts of electrocution by transmission lines on State and federally protected birds resulting from the Project and other past, present, and reasonably foreseeable projects will be less than cumulatively significant. ~~Impacts of transmission lines on State and federally protected birds would be cumulatively significant and unavoidable.~~	Class III	None recommended
	The Project could result in ~~C~~collision with overhead wires by State and/or federally protected birds. (Impact B-21)	Class III	As the flight paths become more constrictive and larger numbers of transmission lines, towers, structures, and vehicles occur in the region the numbers of birds subject to collision will continue to rise; therefore, impacts would be cumulatively significant and unavoidable.	Class I	None recommended
	The Project could result in ~~D~~disturbance to Mohave ground squirrels. (Impact B-22)	Class II	Impacts of the Project to Mohave ground squirrels (if present) have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-1b, B-3a, AQ-1a B-22a: Conduct protocol surveys for Mohave ground squirrels B-22b: Implement construction monitoring for Mohave ground squirrels B-22c: Preserve off-site habitat for the Mohave ground squirrel
Effects on a candidate, Forest Service sensitive, or special-status species (Criterion BIO3)	The Project ~~would result in the~~ ~~L~~loss of candidate, Forest Service Sensitive, or special-status plant species. (Impact B-23)	Class II	The incremental effects of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, are significant because the impact substantially reduces the acreage of suitable habitat for candidate, FS Sensitive, and special-status plant in the region. The impacts to special-status plants would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-1b, B-3a, B-7, AQ-1a, H-1a B-23: Preserve offsite habitat/management of existing populations of special-status plants
	The Project could result in ~~M~~mortality or injury of, and loss of nesting habitat for southwestern pond turtles. (Impact B-24)	Class II	Numerous small- and large-scale residential and planned community developments are also planned within the geographic extent. Project impacts, should they occur, would contribute substantially to the incremental mortality, injury, and loss of nesting habitat for southwestern pond turtles when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable. ~~Mortality, injury, and loss of nesting habitat for southwestern pond turtles would be cumulatively considerable.~~	Class I	B-1a, B-1b, B-3a, B-12, AQ-1a, H-1a, H-1b B-24: Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures
	The Project could result in ~~i~~injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes. (Impact B-25)	Class II	Numerous small- and large-scale residential and planned community developments are also planned within the geographic extent. Project impacts, should they occur, would contribute substantially to the incremental injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable. ~~The impacts to two-striped garter snakes and south coast garter snakes would be considered cumulatively significant and unavoidable.~~	Class I	B-1a, B-1b, B-3a, B-12, AQ-1a, H-1a, H-1b B-25: Conduct focused surveys for the two-striped garter snakes and south coast garter snakes and implement monitoring, avoidance, and minimization measures
	The Project could result in ~~i~~injury or mortality of, and loss of habitat for, Coast Range newts. (Impact B-26)	Class II	Primarily as a result of considerable past effects, Project impacts, should they occur, would contribute substantially to the incremental injury or mortality of, and loss of habitat for, Coast Range newts when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable. ~~The impacts to coast range newts, would be considered cumulatively significant and unavoidable.~~	Class I	B-1a, B-1b, B-3a, AQ-1a, H-1a, H-1b B-26: Conduct focused surveys for coast range newt and implement monitoring, avoidance, and minimization measures

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
	The Project could result in ~~I~~injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species. (Impact B-27)	Class II	Project impacts, should they occur, would contribute substantially to the incremental injury or mortality of, and loss of habitat for, the special-status terrestrial herpetofauna when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.~~The impacts to special-status terrestrial herpetofauna would be considered cumulatively significant and unavoidable.~~	Class I	B-1a, B-1b, B-3a, AQ-1a B-27: Monitoring, avoidance and minimization measures for special status terrestrial herpetofauna
	The Project could ~~D~~disturb~~ance of~~ wintering mountain plovers. (Impact B-28)	Class III	The incremental effect of the proposed Project, when combined with the effects of other past and reasonably foreseeable projects, would be significant, because the combined impact substantially reduces the total amount of suitable wintering habitat in the region. The impacts to wintering mountain plovers would be considered cumulatively significant and unavoidable.	Class I	None recommended
	The Project would result in the ~~L~~loss of occupied burrowing owl habitat. (Impact B-29)	Class II	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities would result in loss of suitable and possibly occupied burrowing owl habitat in the Northern and Southern regions of the Project. Construction-related impacts to occupied burrowing owl habitat would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-1b, B-3a, AQ-1a B-29: Implement CDFG protocol for burrowing owls
	The Project would result in the ~~L~~loss of occupied California spotted owl habitat. (Impact B-30)	Class II	The incremental effect of the Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities would result in loss of suitable and possibly occupied California spotted owl habitat in the Central Region of the Project. Construction-related impacts to occupied California spotted owl habitat would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-3a, AQ-1a B-30: Conduct pre- and during construction nest surveys for spotted owls
	The Project could ~~D~~disturb~~ance of~~ nesting California spotted owls. (Impact B-31)	Class II	The Project construction activities could potentially result in disturbance of nesting California spotted owls in the Central Region of the Project. Implementation of APMs BIO-2 and BIO-4 through BIO-6 and Mitigation Measures B-1b, B-30, and AQ-1a would reduce these impacts. Therefore, cumulative impacts of the Project to nesting California spotted owls would be less than significant ~~Construction-related disturbance to nesting California spotted owls would be considered cumulatively significant and unavoidable.~~	Class III	B-1b, B-30, AQ-1a
	The Project could ~~D~~disturb~~ance of~~ nesting avian “species of special concern”. (Impact B-32)	Class II	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities would take place within or adjacent to habitats that are important for nesting avian Species of Special Concern in southern California. Construction-related impacts to nesting avian species of special concern would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-1b, B-2, B-3a, B-5, AQ-1a
	The Project could result in ~~M~~mortality of, and loss of habitat for, special-status bat species. (Impact B-33)	Class II	Impact would be significant, because the impact substantially reduces the acreage of suitable roosting habitat in the region.	Class I	B-1a, B-1b, B-2, B-3a, AQ-1a B-33a: Maternity colony or hibernaculum surveys for roosting bats B-33b: Provision of substitute roosting bat habitat B-33c: Exclude bats prior to demolition of roosts
	The Project could result in ~~T~~transmission line strikes by special-status bat species. (Impact B-34)	Class III	The frequency of transmission line strikes by special-status bat species is expected to be quite low despite these cumulative effects, due to the ability of these bat species to detect and avoid transmission lines during echolocation. Therefore, the cumulative impacts of transmission line strikes on special-status bat species will be less than significant.	Class III	None recommended
	The Project could result in ~~M~~mortality of, and loss of habitat for, special-status mammals. (Impact B-35)	Class II	The proposed Project would result in the loss of habitat for northwestern San Diego pocket mouse, southern grasshopper mouse, and San Diego black-tailed jackrabbit. Construction-related impacts to special-status mammals would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-1b, B-2, B-3a, AQ-1a
	The Project could result in the ~~M~~mortality of San Diego desert woodrats. (Impact B-36)	Class II	The proposed Project will eliminate approximately 80 acres of suitable habitat for this species within the Chino and Puente Hills of the proposed Project area. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable habitat in the region. The impacts to San Diego desert woodrats would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-1b, B-3a, AQ-1a B-36: Conduct focused surveys for San Diego desert woodrats and passively relocate

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Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
	The Project could result in ~~M~~mortality of, and loss of habitat for, the ringtail. (Impact B-37)	Class II	The proposed Project will impact a small amount of suitable ringtail habitat within Tonner Canyon, and the Tonner Canyon to Carbon Canyon region of the Chino Hills contains more than 2,047 acres of suitable woodland habitat. The impacts to the ringtail would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-1b, B-2, B-3a, AQ-1a, H-1a B-37: Conduct focused surveys for ringtail and passively relocate ~~ringtails~~ during the non-breeding season
	The Project could result in ~~M~~mortality of American badgers. (Impact B-38)	Class II	Would be significant, because the impact substantially reduces the acreage of suitable habitat in these two regions.	Class I	B-1a, B-1b, B-3a, AQ-1a B-38: Conduct focused surveys for American badgers and passively relocate during the non-breeding season
Effects on federally protected wetlands (Criterion BIO4)	~~L~~The Project could result in the loss of wetland habitats. (Impact B-39)	Class II	Though impacts to wetlands from this project are anticipated to be minor based on the acres anticipated to be affected, the impacts to wetland habitats have the potential to combine with similar impacts of other projects. Therefore, ~~i~~Impacts to wetland habitats would be considered cumulatively significant and unavoidable.	Class I	B-1a, B-1b, B-2, B-3a, B-12, AQ-1a, H-1a
Interference with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)	The Project could ~~i~~interfere~~nce~~ with established bird and bat migratory corridors. (Impact B-40)	Class III (Alts. 2, 3, 5) Class II (Alts. 4, 6, 7)	The cumulative impacts of transmission lines on bird and bat migratory corridors resulting from the Project and other past, present, and reasonably foreseeable projects will be less than significant.	Class III	None recommended
	Corona noise ~~w~~could result in disturbance to wildlife. (Impact B-41)	Class III	Corona noise from past, present, and future projects (including the proposed Project) is not expected to combine with noise from other projects in a cumulatively significant manner.	Class III	None recommended
	The Project would result in ~~E~~effects to Management Indicator Species. (Impact B-42)	Class II	Projects such as fuels treatments and special use permitted activities are proposed on the ANF. These cumulative projects would result in unknown acreages of habitat loss for Management Indicator Species. The cumulative impacts on Management Indicator Species resulting from the Project and other past, present, and reasonably foreseeable projects will be cumulatively significant and unavoidable.	Class I	B-1a, B-1b, B-1c, B-2, B-3a, B-3b, B-3c, B-5, B-8b, B-9, B-30, AQ-1a, H-1a, H-1b
Cultural Resources					
Adverse effect on historic properties (Criterion CR1)	Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places. (Impact C-1).	Class II	Preparation of regional cultural resources overviews and research designs, synthetic analysis and interpretation of cultural resources in regional perspective, and expanded public interpretation of resources might lessen the proposed Project's contribution to cumulative degradation of the regional resource base. If more than a few sites are impacted significantly, if the impacts are extensive, and/or if the types of sites impacted by the Project are unique, unusual, or uncommon in the region, then the combination of those impacts with similar impacts of other projects would be cumulatively considerable.	Class I	C-1a: Development and Execution of a Programmatic Agreement C-1b: Inventory cultural resources in the APE C-1c: Avoid and protect cultural resources C-1d: Evaluate the significance of cultural resources that cannot be avoided C-1e: Develop and implement a Historic Properties/Historic Resources Treatment Plan C-1f: Conduct data recovery excavation or other actions to reduce adverse effects C-1g: Conduct cultural resources monitoring C-1h: Workers Environmental Awareness Program~~Train construction personnel to identify cultural resources~~ C-1i: Protect and monitor NRHP-eligible properties
Expose and/or damage to Native American human remains (Criterion CR3)	Native American human remains could be uncovered, exposed, and/or damaged during Construction. (Impact C-2)	Class II	Exposure of unanticipated Native American human remains or sacred features during construction ~~w~~could result in ~~be~~ a significant ~~and unavoidable~~ impact to the remains and an adverse effect under the regulations in the National Historic Preservation Act. Implementation of Mitigation Measure~~s~~ C-2 (Treatment of human remains discovered during construction) would reduce the severity of project-level impacts ~~to the extent feasible but would not reduce impacts~~ to a level of less than significant. Similar measures would be required for any past, present or reasonably foreseeable projects; therefore, ~~T~~this impact is not considered cumulatively considerable.	Class II	C-2~~3~~: Treatment of human remains discovered during construction

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Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
Environmental Contamination and Hazards					
Result in Ssoil contamination, including flammable or toxic gases, during construction (Criterion ECH1)	Soil or groundwater contamination results due to improper handling and/or storage of hazardous materials during construction activities. (Impact E-1)	Class III	Since any spills of contaminated material would be cleaned, soil or groundwater contamination would not occur and this impact would not have the potential to combine with impacts of other projects and would not be cumulatively considerable. This impact is not considered cumulatively considerable.	Class III	None recommended
Result in Mmobilization of contaminants currently existing in the soil, creating potential pathways of exposure to humans or other sensitive receptors (Criterion ECH2)	Excavation or grading could result in mobilization of existing soil or groundwater contamination from known sites. (Impact E-2)	Class II	Since any contamination encountered would be removed and/or remediated prior to construction, this impact would not have the potential to combine with impacts of other projects and would not be cumulatively considerable. Impact is not considered cumulatively considerable.	Class III	E-2a: Perform Phase I ESAs along existing transmission line ROWs E-2b: Perform Phase II Investigations for potentially contaminated sites
	Landfill gas and/or natural gas located near active, inactive or abandoned oil wells could be encountered during excavation or grading, resulting in explosions or exposure of workers to toxic gases. (Impact E-3)	Class II	No concurrent projects located immediately adjacent to the portions of the route located near landfills or oil wells have been identified. Therefore, this impact would not be cumulatively considerable.	Class III	E-3a: Determine if landfill gases are present E-3b: Implement Personnel Safety and Monitoring Measures E-3c: Verify location and status of abandoned oil and natural gas wells
	Unanticipated preexisting soil and/or groundwater contamination could be encountered during excavation or grading. (Impact E-4)	Class II	Could produce a combined effect that would potentially result in soil or groundwater contamination. However, mitigation would be included for the proposed Project to require identification and disposal of potentially impacted soil. Therefore, this impact is not considered cumulatively considerable.	Class III	E-4a: Appoint individuals with correct training for sampling, data review, and regulatory coordination E-4b: Document compliance with APM HAZ-3
	Excavation or grading could result in mobilization of existing soil contamination or encountering ordnance from known munitions testing and disposal sites. (Impact E-6)	Class II (Alts 4C & 4D Only)	Soil testing and mitigation required for this impact would also be required for any past, present or reasonably foreseeable projects. Therefore, impacts resulting from encountering ordnance from known munitions testing and disposal sites would not be cumulatively considerable. Impact is not considered cumulatively considerable.	Class III (Alts 4C & 4D Only)	E-6a: Provide ordinance recognition training (Alts 4C, 4C Modified, & 4D Only) E-6b: Detect and remove MEC from access roads (Alts 4C, 4C Modified, & 4D Only)
Cause Ccontamination of soils or groundwater within the Project area during operation of the Project, resulting in exposure of workers and/or the public to contaminated or hazardous materials (Criterion ECH3)	Soil or groundwater contamination could result from an accidental spill during operation. (Impact E-5)	Class III	Since measures would be in place to greatly reduce the likelihood of a release as a result of proposed Project activities, this impact would not be cumulatively considerable. Impact is not considered cumulatively considerable.	Class III	None recommended
Geology, Soils, and Paleontology					
Known mineral and/or energy resources (Criterion GEO2)	Project activities could interfere with access to known energy resources. (Impact G-1)	Class II	Construction of the proposed Project would preclude other projects from being implemented concurrently in the same location. The proposed Project impacts would not have the potential to combine with similar effects from other projects and would not be cumulatively considerable.	No Impact	G-1: Coordination with oil field operations
Triggering or acceleration of geologic processes, such as landslides, soil erosion, or loss of topsoil, during construction (Criterion GEO3)	Erosion could be triggered or accelerated due to construction activities. (Impact G-2)	Class II	The potential for this impact to combine with similar effects of other projects would only occur if other projects were implemented in the same area at the same time as the Project. However, construction of the Project would preclude other projects from being implemented concurrently in the same location. Therefore impacts would not be cumulatively considerable.	No Impact	H-1a: Implement an Erosion Control Plan and demonstrate compliance with water quality permits
	Excavation and grading during construction activities could cause slope instability or trigger landslides. (Impact G-3)	Class II	Same as for Impact G-2.	No Impact	G-3: Conduct geological surveys for landslides and protect against slope instability
Exposure to potential risk of loss or injury due to earthquake-related ground rupture (Criterion GEO4)	Project structures could be damaged by surface fault rupture at crossings of active faults exposing people or structures to hazards. (Impact G-4)	Class II	Collapse Failure of Project structures and adjacent structures would combine to result in a significant impact where such structures are in close proximity to other structures or people located adjacent to the Project route along Segments 5, 7, 8 and the southern portion of Segment 11. However, due to similar policies regarding construction within active fault zones that have been imposed on past projects and that will likely be imposed on reasonably foreseeable projects, this cumulative impact would be less than significant.	Class III	G-4a: Minimize Avoid placement of Project structures within active fault zones G-4b: Prepare fault rupture contingency plans to minimize repair time for damaged transmission lines
Exposure to potential risk of loss or injury due to seismically induced ground shaking, landslides, liquefaction, settlement, lateral spreading, and/or surface cracking (Criterion GEO5)	Project structures could be damaged by seismically induced groundshaking and/or ground failure exposing people or structures to hazards. (Impact G-5)	Class II	Collapse Failure of Project structures and adjacent structures due to seismically induced ground shaking and ground failure would combine to result in a significant impact where such structures are in close proximity to other structures or people, such as other parallel and crossing transmission lines and substations, and residential and commercial developments located adjacent to the Project route along Segments 5, 7, 8 and the southern portion of Segment 11. However, due to similar policies regarding construction within areas of potential significant seismic shaking and seismically induced ground failures that have been imposed on past projects and that will likely be imposed on reasonably foreseeable projects, this cumulative impact would be less than significant.	Class III	G-3 G-5a: Reduce effects of groundshaking G-5b: Conduct geotechnical investigations for liquefaction

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Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
	Existing structures could be damaged by ground settlement along the tunnel exposing people or structures to hazards. (Impact G-9)	Class II (Alt 5 Only)	Impact would combine but not be cumulatively significant with impacts of other past, present and reasonably foreseeable projects.	Class III (Alt 5 Only)	G-9: Conduct geotechnical analysis of settlement potential during design and implement a Subsidence Monitoring Program during construction to protect against ground settlement (Alt 5 Only)
Exposure to potential risk of loss or injury where corrosive soils or other unsuitable soils are present (Criterion GEO6)	Project structures could be damaged by problematic soils exposing people or structures to hazards. (Impact G-6)	Class II	Same as Impact G-5.	Class III	G-6: Conduct geotechnical studies to assess soil characteristics and aid in appropriate foundation design
Damage to Project structures due to slope failure (Criterion GEO7)	Transmission line structures could be damaged by landslides, earth flows, or debris slides, during operation. (Impact G-7)	Class II	Same as Impact G-5.	Class III	G-3
Destruction of unique paleontological resources (Criterion GEO8)	Grading and excavation could destroy paleontologic resources. (Impact G-8)	Class III	Should resources be discovered during construction of current and future projects, they would be subject to legal requirements designed to protect them, thereby reducing the effect of impacts to a less-than-significant level.	Class III	None recommended
Hydrology and Water Quality					
Water quality violations, waste discharges, or polluted runoff (Criterion HYD1)	Construction activities would degrade surface water quality through erosion and sedimentation. (Impact H-1)	Class II	Would produce a combined effect that would degrade surface water quality through erosion and sedimentation. The contribution of the proposed Project to this impact is small and does not contribute considerably to cumulative effects.	Class I	H-1a: Implement an Erosion Control Plan and demonstrate compliance with water quality permits H-1b: Dry weather construction B-2: Implement RCA Treatment Plan
	Construction activities would degrade water quality through the accidental release of potentially harmful or hazardous materials. (Impact H-2)	Class II	Would produce a combined effect that would degrade surface water quality through the accidental release of potentially harmful or hazardous materials. The contribution of the proposed Project to this impact is small and does not contribute considerably to cumulative effects.	Class I	H-1b
	Operation and maintenance activities would degrade water quality through the accidental release of potentially harmful or hazardous materials. (Impact H-3)	Class III	Would produce a combined effect that would degrade surface water quality through the accidental release of potentially harmful or hazardous materials. The contribution of the proposed Project to this impact is small and does not contribute considerably to cumulative effects.	Class III	None recommended
	Discharge of contaminated groundwater during dewatering operations would degrade surface water quality. (Impact H-6)	Class II (Alts 5 & 7 Only)	Would not likely produce a combined effect that would degrade surface water quality through discharge of contaminated groundwater.	No Impact (Alts 5 & 7 Only)	H-1a
Siltation, erosion, or other flood-related damage from impeding or redirecting flood flows through placement of a structure in a stream or flood hazard area (Criterion HYD3)	Project structures would cause erosion, sedimentation, or other flood-related damage by impeding flood flows. (Impact H-4)	Class II	For the Project this impact would be reduced to a less-than-significant level with implementation of mitigation measures, as would be required for present and foreseeable residential development projects. Therefore, the cumulative impact would be less than significant.	Class III	H-1a
Damage from inundation by mudflow (Criterion HYD5)	Project structures would be inundated by mudflow. (Impact H-5)	Class II	Would produce a combined effect that would increase the potential for Project structures to be inundated by mudflow. The contribution of the proposed Project to this impact is small and does not contribute considerably to cumulative effects.	Class III	G-3: Conduct geological surveys for landslides and protect against slope instability
Land Use					
Preclude a permitted land use, or create a disturbance that would diminish the function of a particular land use (Criterion LU1)	Construction of the Project would temporarily disrupt, displace, or preclude existing residential land uses. (Impact L-1)	Class II	No projects would be constructed at the same time as the proposed Project that would affect the residential land uses within 1,000 feet of the proposed Project's construction-related activities.	No Impact	L-1a: Construction liaison – Property owners L-1b: Advance notification of construction – Property owners L-1c: Quarterly construction updates – Property owners
	Construction of the Project would temporarily disrupt, displace, or preclude existing non-residential land uses. (Impact L-2)	Class II (Alts 2, 3, 6, 7) Class I (Alts 4 & 5)	Could produce a combined effect that would preclude the use of, disturb, or diminish the function of a particular land use within the study area. However, no projects would be constructed at the same time as the proposed Project that would affect the non-residential land uses within 1,000 feet of the proposed Project's construction-related activities. The construction of Alternative 4, Routes A through D, in combination with other proposed energy projects, would result in a significant and unavoidable cumulative impact to non-residential uses. Along Segment 8A of Alternative 5, construction could require the take of commercial and services uses via eminent domain. If eminent domain is required for construction of this alternative, it would result in a significant and unavoidable cumulative impact to non-residential uses.	No Impact (Alts 2,3,6,7) Class I (Alt 4) Class I (Alt 5)	L-2a: Construction plan provisions – Non-residential property owners L-2b: Aircraft flight path and safety provisions and consultations

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Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
	Operation and maintenance of the Project would cause long-term disruption of existing and planned residential land uses. (Impact L-3)	Class III	Prior to construction of the proposed Project, regulatory approvals would be acquired for new and expanded ROWs and substation sites, as well as the rights to construct and operate the proposed Project with affected private property owners. Given that SCE would purchase or lease new and expanded substation sites and ROWs in full agreement with existing property owners, the Project's incremental contribution to the cumulative impact would be less than significant.	Class III	None recommended
	Operation and maintenance of the Project would cause long-term disruption of existing and planned non-residential land uses. (Impact L-4)	Class II (Alts 2, 3, 6, 7) Class I (Alts 4 & 5)	Could produce a combined effect that would preclude the use of, disturb, or diminish the function of a particular land use within the study area. However, mitigation measures would allow affected agencies to address and reconcile any future potential conflicts that the proposed Project may pose to the management and use of non-residential lands. The Project's incremental contribution to the cumulative impact would be less than significant. The construction, operation and maintenance of Alternative 4, Routes A through D, in combination with other proposed energy projects, would result in a significant and unavoidable cumulative impact to non-residential uses. Along Segment 8A of Alternative 5, construction could require the take of commercial and services uses via eminent domain. If eminent domain is required for construction, operation and maintenance of this alternative, it would result in a significant and unavoidable cumulative impact to non-residential uses.	Class II (Alts 2,3,6,7) Class I (Alt 4) Class I (Alt 5)	L-4: Consult with federal, State and local agencies
Conflict with any applicable federal, State, or local land use plans, goals, or policies (Criterion LU2)	Construction, operation or maintenance of the Project would conflict with relevant federal, State, or local land use plans, goals, or policies. (Impact L-5)	Class II (All Except Alt 4) Class I (Alt 4 Only)	The proposed Project would be consistent with USDA Forest Service land use policies and local land use plans and policies as they relate to transmission lines and associated facilities and would be authorized by the USDA Forest Service through its permitting and Forest Plan amendment prior to construction. Additionally, the proposed Project would implement mitigation measures to avoid conflicts with any applicable federal, State or local land use plans, goals, or policies that would be cumulatively considerable, and under the CPUC's General Order Number 131-D, SCE is required to comply with State and federal laws and coordinate with local jurisdictions. Routes A through D of Alternative 4 would conflict with the Chino Hills State Park (CHSP) General Plan, and the expansion of existing ROW or the creation of new ROW within the CHSP may facilitate the siting of future transmission lines within the Park, which would further conflict with the goals and guidelines of the CHSP General Plan. The contribution of the Alternative 4 to this impact would be significant.	Class III (All Except Alt 4) Class I (Alt 4 Only)	L-2b, L-4
Noise					
Substantial temporary or periodic increase in ambient noise levels during construction in the vicinity of sensitive receptors above existing levels (Criterion NOI1)	Construction noise would be substantially ~~higher than ambient noise and would~~ disturb sensitive receptors, ~~located within 200 feet of construction activities resulting in a significant and unavoidable impact.~~ (Impact N-1)	Class I	Could produce a combined effect that would potentially disturb sensitive receptors. The contribution of the proposed Project to this impact would be significant.	Class I	N-1a: Implement Best Management Practices for construction noise N-1b: Avoid sensitive receptors during mobile construction equipment use L-2b: Aircraft flight path and safety provisions and consultations~~)~~
	Construction noise levels would violate local standards. (Impact N-2)	Class I	Could produce a combined effect that would potentially violate local standards. The contribution of the proposed Project to this impact would be significant.	Class I	N-1a, N-1b, L-2b
A ~~P~~permanent and substantially higher level~~s~~ of ambient noise source in the vicinity of sensitive receptors (Criterion NOI2)	Permanent noise levels along the ROW would increase due to corona noise from operation of the transmission lines and substations. (Impact N-3)	Class I	Could produce a combined effect that would potentially increase permanent noise levels along the ROW. The contribution of the proposed Project to this impact would be significant.	Class I	None available
	Operational noise levels would violate local standards. (Impact N-4)	Class I	Could produce a combined effect that would potentially increase permanent noise levels that would violate local standards. The contribution of the proposed Project to this impact would be significant.	Class I	None available
Public Services and Utilities					
Increased demand for public services that cannot be readily met by existing public service providers and facilities (Criterion PSU1)	Emergency services would be needed if an accident or other emergency incident occurs at a construction site. (Impact PSU-1)	Class II	Could produce a combined effect that would potentially require emergency response services. The contribution of the proposed Project to this impact is not significant.	Class III	PSU-1a: Revise SCE's Fire Management Plan PSU-1b: Review of construction methods by county fire departments PSU-1c: Practice safe welding procedures PSU-1d: Fire preventive construction equipment requirements
Impede or interfere with existing public services emergency access	Temporary lane closures during the construction period would interfere with emergency response vehicles. (Impact PSU-2)	Class II	Could produce a combined effect that would interfere with the regular flow of traffic, and limit the ability of emergency response teams to respond to a call. The contribution of the proposed Project to this impact is not significant.	Class III	T-1a: Prepare Traffic Control Plan

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
(Criterion PSU2)	Construction and operation would impede emergency aircraft response services. ~~However, Project helicopters would be restricted by FAA rules on temporary flight restrictions from flying in designated areas, therefore eliminating any potential interference with aerial firefighting operations during a wildfire event in the areas surrounding the Project.~~ (Impact PSU-3)	Class III	Interference with aerial operations; Project's contribution would be cumulatively considerable but less than significant, as all flight operations would be restricted by FAA rules.	Class III	None recommended
Result in a ~~M~~major reduction or interruption of existing utility systems or cause a collocation accident (Criterion PSU3)	Utility systems would be temporarily disrupted during the construction period. (Impact PSU-4)	Class II	Could produce a combined effect that would cause multiple utility outages and disruptions to the public; however, if a disruption is known to be unavoidable, SCE would coordinate with the affected jurisdiction/s and service provider/s in order to avoid multiple or extended disruptions, in accordance with Mitigation Measure PSU-4. Therefore, Impact PSU-4 would be cumulatively considerable but less than significant.	Class III	PSU-4: Notification of utility service interruption
	Public Works maintenance yards would be disrupted during the construction period. (Impact PSU-5)	Class II	Could produce a combined effect that would cause multiple disruptions and restrict access to Public Works maintenance yards; however, it is unlikely that the maintenance yards in the vicinity would be disrupted by activities from multiple construction sites. If a disruption is known to be unavoidable, SCE would coordinate with the appropriate Public Works Department/s in order to avoid multiple or extended disruptions. Therefore, Impact PSU-5 would be cumulatively considerable but less than significant.	Class III	PSU-5: Notification of public service interruption
Substantially change the ability of water treatment, wastewater treatment, or solid waste facilities to adequately supply water and accommodate solid waste and wastewater (Criterion PSU4)	Project construction would temporarily increase water use and Project operation would contribute to increased long-term water consumption. ~~However, water requirements of the Project would not change the ability of the water suppliers to serve existing customers.~~ (Impact PSU-6)	Class III	Could produce a combined effect that would put a strain on the existing water supply. The contribution of the proposed Project to this impact is small and does not contribute considerably to cumulative effects.	Class III	None recommended
	Additional wastewater would be generated during Project construction and operation. ~~However, the proposed Project would not place a significant burden on wastewater facilities serving the area and would not necessitate expansion of wastewater collection or treatment facilities serving the area.~~ (Impact PSU-7)	Class III	Not expected to produce a combined effect that would exceed the capabilities of the wastewater facilities.	Class III	None recommended
	Additional solid waste would be generated during Project construction and operation. (Impact PSU-8)	Class III	Not expected to produce a combined effect that would generate waste and exceed the capacity of active disposal sites.	Class III	None recommended
Conflict with or be unable to adhere to federal, State, and/or local laws, regulations, or standards relating to solid waste (Criterion PSU6)	The amount of waste material recycled during construction activities would not adhere to State standards. (Impact PSU-9)	Class II	The proposed Project would comply with standards and regulations relating to solid waste. As such, the proposed Project would not contribute to the cumulative impact and would not be cumulatively considerable.	Not Cumulatively Considerable	PSU-9: Recycle construction waste
Socioeconomics [6]					
Private property values	Operation and maintenance activities would affect property values along the Project alignment. (Impact S-1)	Not Significant	The Project area is experiencing rapid rates of growth and residential development. This growth trend indicates that the Project area is consistently becoming a more desirable place to site homes and businesses, which typically leads to an increase in property values. However, regardless of any potential increase in private property values, the proposed Project would have the potential to adversely affect property values.	Not Significant	None recommended
Revenue decrease for agricultural landowners	Construction activities would cause a temporary decrease in revenues for agricultural landowners. (Impact S-2)	Not Significant	The proposed Project may result in temporarily decreased agricultural revenues during construction; this impact could combine with similar effects of other projects if such projects were to occur at the same time and in the same vicinity. It is considered highly unlikely that projects with construction impacts similar to the proposed Project's construction impacts would occur at the same time and in the same vicinity as under the proposed Project. The proposed Project is not expected to permanently remove agricultural areas, including farmland, from continuation of present usage.	Not Cumulatively Considerable	AG-1: Coordinate construction activities with agricultural landowners

[6] In accordance with State CEQA Guidelines §15131, economic and social effects are not to be treated as significant effects on the environment. NEPA regulations define effects as including social and economic impacts, and they may be considered significant based on context and intensity.

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
Public agency revenue	Project activities would affect public agency revenue. (Impact S-3)	Not Significant	Project activities would not result in a permanent adverse change in public resource revenue, although Project construction would likely result in a loss of Forest Service revenue as a result of decreased Adventure Pass sales related to access restrictions on ANF lands. The Project's permanent incremental contribution to the overall revenue impacts due to combined operation of projects in the Project area would likely result in beneficial revenue impacts to public agencies through property taxes, sales taxes, and other forms of public revenue.	Not Cumulatively Considerable	R-1e: SCE shall compensate ANF for lost income from Adventure Pass sales due to recreation area closures associated with the Projectassist in the completion of backlogged maintenance activities in the ANF
Traffic and Transportation					
Closure of roads or reduction of travel lanes (Criterion TRA1)	Closure of roads to through traffic or reduction of travel lanes would result in substantial congestion. (Impact T-1)	Class II	All projects requiring work within ROWs of public streets and highways are required to obtain encroachment permits. In order for a cumulative impact to occur, lane closures from different projects would have to occur at the same time and on the same road or a connecting road within close proximity (up to two miles) to the lane closure from the proposed Project. Past projects in the Project area would not combine with impacts of the proposed Project because construction of those projects is complete and lane closures associated with such construction would no longer be necessary. Therefore, it is considered unlikely that this impact of the proposed Project would combine with similar impacts of other projects to result in a cumulatively significant impact.	Class III	T-1a: Prepare Traffic Control Plans T-1b: Restrict lane closures
Unacceptable level of service reduction to vicinity roads (Criterion TRA2)	Construction traffic would result in congestion on area roadways. (Impact T-2)	Class II	Mitigation Measures would effectively reduce the proposed Project's contribution to a cumulative impact by minimizing the amount of construction traffic on area roadways.	Class III	T-2: Prepare Construction Transportation Plan
Restricted access to properties (Criterion TRA3)	Underground construction activities would temporarily restrict access to properties. (Impact T-11)	Class II (Alt 7 Only)	If other projects required the use of the same public ROW at the same time as the proposed Project, the regulatory agency responsible for issuing the encroachment permit would ensure that work within a public road would not occur simultaneously with the proposed Project to avoid significant cumulative impacts.	Class III (Alt 7 Only)	T-11: Provide continuous access to properties (Alt 5 Only)
Restrict the movements of emergency vehicles (Criterion TRA4)	Construction activities could temporarily interfere with emergency response. (Impact T-3)	Class II	Mitigation Measures effectively reduce the proposed Project's contribution to a cumulative impact by requiring construction activity to be coordinated in advance with emergency service providers to avoid restricting movements of emergency vehicles.	Class III	T-1a, T-1b
Disruption to transit service (Criterion TRA5)	Construction activities could temporarily disrupt transit routes. (Impact T-4)	Class II	Mitigation Measures would effectively reduce the proposed Project's contribution to a cumulative impact by requiring construction activity to be coordinated in advance with school districts and transit providers. Additionally, lane closures associated with the proposed Project would be of very short duration.	Class III	T-4: Avoid disruption of bus service
Disruption to rail traffic (Criterion TRA6)	Construction activities would cause a temporary disruption to rail traffic or operations. (Impact T-5)	Class II	Compliance with railroad permit requirements would ensure that proposed Project construction activities would not disrupt rail traffic. Other projects would be required to obtain similar permits, thus railroad companies would be able to regulate the timing of potential disruptions and cumulative impacts would not occur.	No Impact	T-5: Obtain and comply with railroad permits
Impediment of pedestrian movements or bike paths (Criterion TRA7)	Construction activities could temporarily interfere with the use of pedestrian/bicycle paths. (Impact T-6)	Class II	Implementation of Mitigation Measures would effectively reduce the proposed Project's contribution to a cumulative impact by requiring establishment of alternative pedestrian and bicycle routes around the proposed Project construction zone for safe passage as well as temporary detours for trail users.	Class III	T-6: Ensure pedestrian and bicycle circulation and safety
Reduction in the supply of parking spaces (Criterion TRA8)	Construction would result in localized shortages of public parking along the Project ROW. (Impact T-7)	Class II	This impact would occur in residential areas during daytime hours when street parking is most ample. Therefore, it is unlikely that other projects with the potential to eliminate substantial numbers of public parking spaces would be located in close proximity of the proposed Project.	No Impact	T-2
Construction would be inconsistent with transportation plans (Criterion TRA9)	Construction would conflict with planned transportation projects. (Impact T-8)	Class II	The proposed Project would be required to obtain an encroachment permit or other such agreement from the applicable jurisdictional agency and would therefore not conflict with planned transportation projects.	No Impact	T-8: Avoid conflicts with planned transportation improvements ~~to SR14~~
Noticeable deterioration of road surfaces (Criterion TRA10)	Construction vehicles and equipment could damage road ROWs. (Impact T-9)	Class III	Deterioration caused by Project construction traffic would be repaired and would not have the potential to combine with deterioration or damage from other projects.	No Impact	None recommended
Adverse effects to aviation activities (Criterion TRA11)	Project transmission structures could present an aviation hazard. (Impact T-10)	Class II	Final design of all projects with structures greater than 200 feet in height would have to comply with FAA guidelines. Projects located within military flight pathways would be required to submit the project application to the appropriate US Military Branch for review to ensure conflicts would not occur. Compliance with these procedures would ensure that potential impacts from multiple projects would not combine.	Class III	T-10: Notify US ~~Air Force~~Military

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
Visual Resources					
Have a Ssubstantial adverse effects on the existing landscape character and visual quality of the site and its surroundings (Criterion VIS1)	Temporary visibility of construction activities and equipment involved with the Project would alter the landscape character and visual quality of landscape views. (Impact V-1)	Class I	Ongoing development throughout the cumulative effects area for visual resources would be readily visible throughout the Project area, and would be cumulatively adverse and significant.	Class I	V-1: Clean up staging areas, storage areas, marshalling yards, helicopter staging areas, access and spur roads, and structure locations on a regular periodic basis
	For a landscape that currently has no transmission lines, introduction of a new transmission line in a new ROW would adversely affect landscape character and visual quality. (Impact V-2)	Class I	New transmission infrastructure in areas that currently do not have such industrial facilities would adversely affect natural-appearing landscape character and visual quality. Also may encourage development of other transmission lines or cross-country infrastructure to develop in a parallel corridor. Development of additional transmission lines along Segment 10 or 4 would increase potential cumulative visual effects.	Class I	V-1 V-2a: Use tubular steel poles instead of lattice steel towers in designated areas V-2b: Treat surfaces with appropriate colors, textures, and finishes V-2c: Establish permanent screen V-2d: At road crossings, structures should be offset so that they are equidistant on each side of the road where feasible ([Alternatives 3, 4, 7 only)]
	For a landscape with an existing transmission line, increased structure size and new materials would result in adverse visual effects. (Impact V-3)	Class I	Increased structure size and new materials of these future transmission lines would result in similar adverse visual effects.	Class I	V-1, V-2a, V-2b, V-2c, V-2d ([V-2d applies only to Alts 3, 4, 7)] V-3a: Match spans of existing transmission structures V-3b: On NFS lands, provide restoration/compensation for impacts to landscape character and visual quality V-4b and V-4d (See Impact V-4)
	Vegetative clearing and/or earthwork associated with road improvements and pulling/splicing locations would adversely affect landscape character and visual quality. (Impact V-4)	Class I	With construction of these new transmission lines, it is reasonably foreseeable that additional vegetative clearing would occur further reducing landscape character and visual quality. Impacts would be cumulatively significant.	Class I	V-4a: Construct, operate, and maintain the Project with existing access and spur roads where feasible V-4b: Slope-round and re-contour in areas as prescribed V-4c: Avoid locating new roads in bedrock on NFS lands V-4d: Dispose of excavated materials as prescribed
Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area. (Criterion VIS2)	New metal surfaces associated with transmission infrastructure would potentially reflect sunlight and produce glint and glare in certain lighting conditions. (Impact V-5)	Class II	New materials used in construction of existing and future projects (including the proposed Project) within the Project area viewshed have created and have the potential to produce, respectively, daytime glare and new sources of nighttime light and glare leading to cumulatively adverse and significant visual impacts.	Class I	V-2b
Substantially Ddamage scenic resources within a scenic highway viewshed or a national scenic trail viewshed (including, but not limited to, trees, rock outcroppings, and historic buildings. (Criterion VIS3)	The Project would contribute to the long-term loss or degradation of a scenic highway viewshed or scenic trail viewshed. (Impact V-6)	Class II	Combined with the adverse visual effects of existing transmission lines, introduction of newer, taller transmission line structures in Segments 6 and 11 in the Center Area (ANF) and in Segment 8 in the South Area would create a persistent adverse visual effect on scenic highway and scenic trail viewsheds.	Class I	V-3b
	The Project would conflict with established visual resource management plans or landscape conservation plans. (Impact V-7)	Class I	Future projects, including the proposed Project, that would upgrade the size of transmission lines or maintain/improve access and spur roads would add to cumulative visual effects resulting in cumulative significant impacts.	Class I	~~None recommended~~V-3b
Wilderness and Recreation					
Directly or indirectly disrupt or preclude activities in established federal, State, or local recreation areas or wilderness areas. (Criterion REC1)	Construction activities would restrict access to or disrupt activities within established recreational areas. (Impact R-1)	Class II	Due to the likely potential for this impact to affect the same recreational resource(s) at the same time, Impact R-1 would be cumulatively significant and unavoidable.	Class I	R-1a: Coordinate construction schedule and maintenance activities with managing officer(~~s~~) for affected recreation areas R-1b: Identify and provide noticing of alternative recreation areas R-1c: Notification of temporary closure of OHV routes R-1d: Notification of temporary closure and reroute of the Pacific Crest National Scenic Trail R-1e: SCE shall compensate ANF for lost income from Adventure Pass sales due to recreation area closures associated with the Project~~design informational brochures and provide at recreation agencies' offices and assist in the completion of backlogged maintenance activities in the ANF~~
	Operation and maintenance activities would restrict access to or disrupt activities within established recreational areas. (Impact R-2)	Class II	Although the operation of other projects could preclude certain recreational areas from use, ongoing development and planned urban expansion in the North and South Regions include new recreational areas and resources to accommodate growing population. Project operational activities in the ANF would not be cumulatively considerable regarding the preclusion of recreational or wilderness areas.	Class III	R-1a through R-1d

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
Substantially contribute to the long-term loss or degradation of the factors that contribute to the value of federal, State, local, or private recreational facilities or wilderness areas (Criterion REC2)	Project activities (construction or operation and maintenance) would cause or contribute to the degradation of one or more of the four primary characteristics of a designated Wilderness Area, as defined by the Wilderness Act, Public Law 88-577 (16 U.S.C. 1131-1136). (Impact R-3)	Class III (All Except Alt 6) Class II (Alt 6 Only)	The proposed Project would contribute to degradation of the San Gabriel WA's characteristic of "solitude and unconfined recreation"; due to the sensitivity and uniqueness of designated WAs, any other project that would occur near that San Gabriel WA and would have the potential to degrade any of the WA's four primary characteristics would be significant. However, it is considered highly unlikely that one such project would have the potential to cause or contribute to the degradation of a primary characteristic of the San Gabriel WA in the same way and/or during the same timeframe as the proposed Project. Therefore, Impact R-3 would be cumulatively considerable but less than significant	Class III	L-2b: Aircraft flight path and safety provisions and consultation
	The Project would cause or contribute to degradation of the Pacific Crest National Scenic Trail (PCT). (Impact R-4)	Class II	The proposed Project would traverse the PCT three times and as such, the contribution to the cumulative impact is substantial. Similar impacts are expected to be associated with other development projects along the PCT. Cumulative effect would be significant.	Class I	R-1a, R-1d, R-1e
	The Project would contribute to degradation of Off-Highway Vehicle (OHV) trails or Open Riding Areas, or would result in a loss of recreational opportunity for OHV users. (Impact R-5)	Class II	It is expected that the Forest Service will continue to provide designated OHV areas in the Forest and as such, if present or future projects in the ANF require OHV roads to be upgraded, they will be returned to original condition after project construction, thereby avoiding long-term loss of degradation. Project contribution to this cumulative impact is not significant.	Class III	R-5: Avoid permanent upgrades to Forest System roads
	The Project would facilitate unmanaged recreational uses that would contribute to the long-term loss or degradation of recreational opportunities. (Impact R-6)	Class II	The proposed Project would require that existing access roads be improved and new roads be constructed to provide access for construction and maintenance vehicles to all transmission towers associated with the Project. Road improvements within the ANF could lead to unmanaged recreation and would have a substantial influence on the potential cumulative impact due to the fact that unmanaged recreation is a recognized threat to the integrity of designated Inventoried Roadless Areas and Wilderness Areas, which are considered to be particularly sensitive.	Class I	R-5
Wildfire Prevention and Suppression					
Adverse effects on fire prevention and suppression activities (Criterion FIRE1)	Construction and/or maintenance activities would reduce the effectiveness of firefighting. (Impact F-1)	Class II	Existing transmission line maintenance activities that block roads within the ANF could combine to seriously delay firefighting operations during the fire season in the event of a fire in the ANF. However, Mitigation Measure F-1 (Prepare wildland traffic control plans) would reduce this impact of the Project and ensure access for emergency response vehicles. Therefore, the Project would not be cumulatively considerable and no cumulative effect would occur.~~The contribution of the proposed Project to this impact would not be cumulatively considerable.~~	Class III	F-1: Prepare wildland traffic control plans
	The presence of new or higher overhead transmission line would reduce the effectiveness of firefighting. (Impact F-2)	Class III (All Except Alt 4) Class I (Alt 4 Only)	The proposed Project would combine with existing transmission lines and other current and future projects that may impede firefighting activities, resulting in a cumulatively considerable impact only in those areas where new transmission line would be constructed outside of existing utility corridors.~~This impact would be cumulatively significant and unavoidable.~~	Class III (All Except Alt 4) Class I (Alt 4 Only)	None recommended
Exposure of communities, firefighters, personnel, and/or natural resources to an increased risk of wildfire (Criterion FIRE2)	Construction and/or maintenance activities would increase the risk of wildfire. (Impact F-3)	Class II	Mitigation measures would restrict Project related activities to times during which Santa Ana winds are not blowing, which would limit the severity of construction or maintenance ignited fires. Mitigation measures would substantially reduce the risk of Project-related wildfire ignition, and this effect would therefore not combine with other construction projects in the area to result in a cumulatively considerable impact. The cumulative effect would be less than significant with mitigation incorporated.~~The contribution of the proposed Project to this impact would be cumulatively significant and unavoidable.~~	Class II	F-3a: Revise SCE's Fire Management Plan for maintenance activities F-3b: Cease work during Red Flag Warning events F-3c: Ensure open communication pathways F-3d: Remove hazards from the work area F-3e: Comply with non-smoking policy on PHLNHPA lands F-3f: Share costs for ANF fuelbreak maintenance F-3g: Provide transmission line safety training to ANF staff
	Construction and/or maintenance activities would increase the risk of personnel injury or death in the event of fire. (Impact F-4)	Class II	The proposed Project would increase the risk of construction and maintenance personnel injury or death in the event of an uncontrolled wildland fire to a less-than-significant level after mitigation. However, this effect would not combine with other past, present, nor reasonably foreseeable projects to result in a cumulative impact to personnel. Therefore this impact would not be cumulatively significant~~The contribution of the proposed Project would not combine with other past, present, nor reasonably foreseeable projects to result in a cumulative impact to personnel. Therefore this impact would not be cumulatively significant.~~.	No Impact	F-3b F-4: Prepare and implement Emergency Evacuation Plan

Table ES-3. Matrix of Proposed Project and Alternatives Direct, Indirect, Cumulative Effects, and Mitigation Measures

Type of Effect	Direct or Indirect Project Effects	Significance of Direct and Indirect Effects[2]	Potential Cumulative Effect	Cumulative Significance per Alternative[3]	Mitigation Measures
	Presence of the overhead transmission line would increase the risk of wildfire and compromise firefighter safety. (Impact F-5)	Class III (All Except Alt 4) Class I (Alt. 4 only)	The risk of wildfire ignition would increase only in those areas where new transmission line would be constructed outside of existing utility corridors. This effect would not combine with other past, present, and reasonably foreseeable projects to result in a cumulative impact except for the rerouted portions of Alternative 4. The rerouted portions of Alternative 4 would create a new source of potential wildfire ignitions for the life of the project in a high-risk landscape, and even a single wildfire ignition could result in a devastating wildfire during extreme weather conditions. This effect related only to the rerouted portion of Alternative 4 would therefore combine with other projects to result in a significant cumulative impact. ~~The contribution of the proposed Project to this impact would be cumulatively considerable resulting in a significant and unavoidable cumulative impact.~~	No Impact~~Class III~~ (All Except Alt 4) Class I (Alt 4 Only)	None recommended for all alternatives, except Alt 4. F-5: Share costs for fuelbreak maintenance (Alt 4 Only)
~~Activities associated with Project construction or maintenance result in a fuel vegetation matrix with an~~ Iincreased ignition potential and rate of fire spread (Criterion FIRE3)	Project activities would introduce non-native plants, which would contribute to an increased ~~ignition potential and~~ rate of fire spread. (Impact F-6)	Class II	Because invasive plant introductions to wildland areas is reasonably foreseeable despite best efforts at mitigation, and because Mitigation Measure B-3a (Prepare and implement a Weed Control Plan) would not completely eliminate the risk of non-native species introduction, ~~T~~the incremental effects of the proposed Project on non-native species introduction that adversely affect wildfire behavior are considered cumulatively considerable. This impact would be cumulatively significant and unavoidable.	Class I	B-3a: Prepare and implement a Weed Control Plan
Electrical Interference and Hazards					
Harmful interference with radio/television/communications/ electronic equipment (Criterion EIH1)	The Project would cause radio, television, communications, or electronic equipment interference. (Impact EIH-1)	Class II	The contribution of the proposed Project to this impact would not be additive or cumulatively considerable.	No Impact	EIH-1a: Limit conductor surface electric gradient EIH-1b: Document and resolve electronic interference complaints
Induced currents or shock hazards to the public (Criterion EIH2)	The Project would cause induced currents and shock hazards in joint use corridors. (Impact EIH-2)	Class II	The contribution of the proposed Project to this impact would not be additive or cumulatively considerable.	No Impact	EIH-2: Implement grounding measures
Interference with cardiac pacemakers (Criterion EIH3)	Project operation would result in electric fields that would affect cardiac pacemakers. (Impact EIH-3)	Class III	The contribution of the proposed Project to this impact would not be additive or cumulatively considerable.	No Impact	None recommended
Introduction of hazards related to wind or earthquakes (Criterion EIH4)	Project structures would be affected by wind and earthquakes. ~~The risk that high winds or an earthquake would cause transmission line structures to threaten public safety is not significant.~~ (Impact EIH-4)	Class III	The proposed Project would be constructed on steel lattice towers or tubular steel poles, where failure as a result of extreme wind conditions would be highly unlikely. Overhead transmission lines are designed for dynamic loading under variable wind conditions that generally exceed earthquake loads. The contribution of the proposed Project to this impact would not be additive or cumulatively considerable.	No Impact	None recommended

1. Introduction

This joint Environmental Impact Report (EIR) and Environmental Impact Statement (EIS) has been prepared by the California Public Utilities Commission (CPUC) as Lead Agency under the California Environmental Quality Act (CEQA), and the USDA Forest Service as Lead Agency under the National Environmental Policy Act (NEPA). This EIR/EIS is intended to inform the public and meet the needs of local, State, and federal agencies that will need to consider issuing approvals and permits for the ~~proposed~~ Tehachapi Renewable Transmission Project (TRTP, or "proposed Project"), as proposed by Southern California Edison (SCE). The proposed Project, which is described in full detail in Chapter 2 (Description of Alternatives, including the Proposed Project) of this document, would connect the Tehachapi Wind Resource Area (TWRA) in southern Kern County with SCE's transmission system in order to deliver power produced in the TWRA to utility load centers.

On June 29, 2007, SCE submitted Application No. A.07-06-031 to the CPUC for a Certificate of Public Convenience and Necessity (CPCN), as required for the construction and operation of the proposed Project (see Section 1.2.2 below). With the CPCN application, SCE also submitted its Proponent's Environmental Assessment (PEA) for the proposed Project. Because the proposed transmission line would traverse approximately 42 miles of National Forest System (NFS) lands, SCE also filed an application for a Special Use authorization with the USDA Forest Service on June 29, 2007, seeking permission for construction, operation, and maintenance of the proposed Project on NFS lands in the Angeles National Forest (ANF). Because the Project also crosses lands owned by the U.S. Army Corps of Engineers (USACE), the USACE has elected to participate as a Cooperating Agency for the NEPA review of the Project. In addition, portions of Alternative 4 (Chino Hills Routes) cross land owned by the California Department of Parks and Recreation (CDPR), which would require discretionary approvals from both the California State Parks and Recreation Commission and CDPR. Therefore, both agencies are considered to be Responsible Agencies for the CEQA review of the Project. Other Responsible Agencies are listed in Section 1.3 below.

If the Forest Service decides to issue a Special Use authorization for the proposed Project or an alternative to the Project, several amendments to the governing 2005 Forest Land Management Plan (FLMP, or Forest Plan) would be required in order to ensure consistency of actions under the Special Use authorization with management direction in the FLMP. Section 1.3 (Agency Use of this Document) includes a discussion of the 2005 Forest Plan amendments that are expected to be required prior to implementation of the proposed Project or one of the Project alternatives.

This EIR/EIS evaluates and presents the environmental impacts that are expected to result from construction, operation, and maintenance of SCE's proposed Project and presents recommended mitigation measures that, if adopted, would avoid or minimize associated environmental impacts. In accordance with both CEQA and NEPA requirements, this EIR/EIS also identifies and analyzes alternatives that address significant environmental issues associated with the proposed Project, including the No Project/Action Alternative.

The intent of this joint EIR/EIS is to inform the public and meet the needs of federal, State, and local agencies that will need to issue permits or other approvals for the proposed Project. The proposed Project is described briefly below and in detail in Chapter 2 (Description of Alternatives, including the Proposed Project) of this joint document. This EIR/EIS does not make a recommendation regarding the approval or denial of the Project; it is purely informational in content and will be used by the CPUC and Forest Service, as well as by

responsible and cooperating agencies, in considering whether or not to authorize and/or approve the proposed Project or an alternative to the proposed Project.

The content of this EIR/EIS reflects relevant input received from government officials, public agencies, nongovernmental organizations, and concerned members of the public during the EIR/EIS scoping period following the CPUC's publication of the Notice of Preparation (NOP) of an EIR (August 31, 2007), and the Forest Service's publication of the Notice of Intent (NOI) to prepare an EIS (*Federal Register* Vol. 72, No. 173, page 51404, September 7, 2007). During the public scoping and comment period for the proposed Project, public involvement activities including the following were completed: establishment of an Internet web page and a telephone hotline for Project information and to receive public comments; distribution of the NOP, NOI, and scoping meeting notices; multiple public scoping meetings were conducted; and multiple meetings with affected local jurisdictions were conducted to discuss comments and concerns related to the Project. Please see Section 7.1 (Public Participation and Notification) for a full description of public scoping activities. Consultation with affected public agencies continued beyond the formal scoping period, as needed, to resolve concerns related to the Project.

The primary components of the proposed Project include: (1) Construct new 500-kV transmission lines; (2) Construct new single-circuit 220-kV transmission lines; (3) Rebuild existing 220-kV lines to 500-kV standards; (4) Rebuild existing single-circuit transmission lines to double-circuit transmission lines; (5) Relocate several existing 66-kV subtransmission lines; (6) Construct a new 500-kV substation; and (7) Upgrade five existing substations. Approximately 42 miles of the proposed Project would be located on NFS lands in the ANF and up to approximately sixteen~~three~~ miles of the proposed transmission facilities ~~would~~ may require right-of-way (ROW) expansion on ANF lands. In addition, approximately 6.4 miles of the proposed Project alignment would be located on land owned by the USACE (in the vicinity of Santa Fe Dam and Whittier Narrows in Los Angeles County (Segments 7 and 8). Some of the USACE lands are leased or otherwise outgranted for specific purposes, such as long-term leases for use and management for public recreational purposes; however, the USACE has ultimate control and responsibility over those lands. The USACE has separate regulatory jurisdiction pursuant to Section 404 of the Clean Water Act for the discharge of fill or dredged material into waters of the United States (see Section 1.3).

The Station Fire, the largest in the history of Los Angeles County, started on the ANF on August 26, 2009; just as this Final EIR/EIS was due to go to press. The Station Fire burned approximately 160,000 acres, or 250 square miles, mostly within the ANF. The Station Fire was only declared contained on October 16, 2009, one week before this document went to print. The CPUC has undertaken an evaluation, in compliance with CEQA, to determine whether any changed conditions caused by the Station Fire would result in new significant project-related environmental effects or call for new or revised mitigation measures. This evaluation, which has been included as Appendix L to this document, concludes that there are no changed conditions caused by the Station Fire that require a recirculation of this document pursuant to CEQA. However, several mitigation measures have been revised to address certain effects created by the fire.

Under its normal protocols, the USDA Forest Service is conducting a detailed review of the impacts of the Station Fire and will determine how to proceed upon completion of that review. The USDA Forest Service is not issuing its Final EIS or Record of Decision until that review is completed. The CPUC and the USDA Forest Service have agreed that this further review of post-fire conditions by the USDA Forest Service does not need to delay the CPUC's separate decision on the proposed Project.

The proposed Project and alternatives are briefly summarized below in Section 1.1 (please see Chapter 2 for a full description); the Project's purpose and need are discussed in Section 1.2; agency use of this document is

presented in Section 1.3; an overview of the environmental review process is provided in Section 1.4, and a readers' guide to this EIR/EIS is included in Section 1.5.

1.1 Overview of Proposed Project/Action and Alternatives

Presented below is an overview of the alternatives considered as part of this EIR/EIS. Pursuant to CEQA (Guidelines Section 15126.6(a)) and NEPA (40 CFR 1505.1(e)), a reasonable range of alternatives to SCE's proposed Project (Alternative 2) are examined in this EIR/EIS, and were selected based on the following criteria: (1) the alternative's potential to meet most of the Project objectives/purpose and need, (2) the feasibility of the alternative, and (3) the alternative's ability to avoid or lessen adverse effects of ~~address significant environmental issues associated with~~ SCE's proposed Project. As required under CEQA Section 15126.6(e) and NEPA Section 1502.14(d), a No Project/Action alternative was also considered. The proposed Project and alternatives include the following:

Alternative 1: No Project/Action Alternative. Under the No Project/Action Alternative the Tehachapi Renewable Transmission Project, as proposed, would not be implemented. As such, none of the associated Project activities would occur and the environmental impacts associated specifically with the proposed Project would not occur. However, in the absence of the Project, SCE still would continue to operate and maintain the existing transmission structures, including access roads and spur roads, for operation and maintenance purposes under a variety of agreements (landowners and land managers) and permits (Forest Service and USACE). For example, within the ANF, approximately 80 miles of roads are currently being used to access the existing structures along Segments 6 and 11, which the use and maintenance of is authorized through existing roads permits issued by the Forest Service. SCE would also be required to interconnect and integrate power generation facilities into its electric system, as required under Sections 210 and 212 of the Federal Power Act (16 U.S.C. § 824 [i] and [k]) and Sections 3.2 and 5.7 of the California Independent System Operator's (CAISO's) Tariff. Various scenarios related to electricity generation and transmission reasonably expected to occur in the foreseeable future are identified in Chapter 2 (Description of Alternatives, including the Proposed Project) of the EIR/EIS.

Alternative 2: SCE's Proposed Project. SCE's proposed Project would involve construction, operation, and maintenance of new and upgraded transmission infrastructure along approximately 173 miles of new and existing ROWs from the TWRA in southern Kern County, south through Los Angeles County and the ANF, and east to the existing Mira Loma Substation in Ontario, San Bernardino County, California. The proposed Project would traverse approximately 42 miles of NFS lands in the ANF, as well as approximately 6.4 miles of lands that are owned by the USACE in the vicinity of Santa Fe Dam and Whittier Narrows in Los Angeles County (Segments 7 and 8). Primary components of SCE's proposed Project include the following:

- Build a new single-circuit 500-kV transmission line (T/L) traveling approximately 16.8 miles in new ROW between the approved Windhub Substation and the proposed new Whirlwind Substation (Segment 10);
- Build two new single-circuit 220-kV T/Ls for approximately four miles (traveling parallel) in new ROW between the proposed (not part of Project) Cottonwind Substation to the proposed new Whirlwind Substation (Segment 4 – 220 kV);
- Build a new single-circuit 500-kV T/L for approximately 15.6 miles in new ROW between the proposed new Whirlwind Substation and the existing Antelope Substation (Segment 4 – 500 kV);
- Replace ~~Rebuild~~ approximately 17.4~~8~~ miles of the existing Antelope-Vincent 220-kV T/L and the existing Antelope-Mesa 220-kV T/L with only one new T/L built to 500-kV standards in existing ROW between the existing Antelope and Vincent Substations (Segment 5);

- Rebuild approximately 18.7 miles of existing 220-kV T/L to 500-kV standards between the existing Vincent and Gould Substations and construct a new 220-kV circuit on the vacant side of the existing double-circuit structures of the Eagle Rock-Mesa 220-kV T/L between the existing Gould and Mesa Substations (Segment 11);
- Rebuild approximately 31.9 miles of existing 220-kV T/L to 500-kV standards from the existing Vincent Substation to the southern boundary of the ANF, including approximately 26.9 miles of the existing Antelope-Mesa 220-kV T/L and approximately five miles of the existing Rio Hondo-Vincent 220-kV No. 2 T/L (Segment 6);
- Rebuild approximately 15.8 miles of existing Antelope-Mesa 220-kV T/L to 500-kV standards from the southern boundary of the ANF to the existing Mesa Substation (Segment 7);
- Rebuild approximately 33 miles of existing Chino-Mesa 220-kV T/L to 500-kV standards from a point approximately two miles east of the existing Mesa Substation (the "San Gabriel Junction") to the existing Mira Loma Substation. Also rebuilding approximately seven miles of the existing Chino-Mira Loma No. 1 line from single-circuit to double-circuit 220-kV structures (Segment 8);
- Build the new Whirlwind Substation, a 500/220-kV substation located approximately four to five miles south of the proposed (not part of Project) Cottonwind Substation near the intersection of 170th Street and Holiday Avenue in Kern County near the TWRA (Segment 9);
- Upgrade the existing Antelope, Vincent, Mesa, Gould, and Mira Loma Substations to accommodate new T/L construction and system compensation elements (Segment 9);
- Install associated telecommunications infrastructure; and
- Apply approved herbicides to select invasive plant species in the Project area on NFS lands within the ANF. The nature and extent of invasive species control would be further defined in an Operations and Maintenance Plan included in the Special Use authorization issued by the Forest Service.

Alternative 3: West Lancaster Alternative. This alternative would re-route the new 500-kV T/L in Segment 4, which is currently proposed along 110th Street West, 0.5 miles farther west along 115th Street West. As with the proposed Project, Alternative 3 would traverse approximately 42 miles of NFS lands in the ANF and approximately 6.4 miles of lands that are owned by the USACE.

Alternative 4: Chino Hills Alternatives. ~~Four~~Five route variations in the Chino Hills area have been analyzed, as described below. Implementation of one of these routing options would eliminate construction of approximately 16 miles of 500-kV structures along Segments 8A and 8C. Per the 2009 CAISO Transmission Plan, upgrades would continue to be required in Segment 8B (6.8 miles) between Chino and Mira Loma Substations through the cities of Chino and Ontario, same as Alternative 2.

- **Route A** would place a new double-circuit 500-kV T/L in Segment 8A through Chino Hills State Park (CHSP) parallel to and south of an existing double-circuit 220-kV T/L. This alternative route would require construction of a new 500-kV switching station in CHSP, which would allow the new 500-kV T/Ls to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.
- **Route B** represents a refinement to Alternative 4 Route A, in which a new double-circuit 500-kV T/L in Segment 8A would be routed completely through CHSP parallel to and north of an existing double-circuit 220-kV T/L. This alternative route would require construction of a new 500-kV switching station, which would be located east of and outside of the CHSP, and would allow the new double-circuit 500-kV T/L to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.
- **Route C** represents a refinement to Alternative 4 Route A, in which a new double-circuit 500-kV T/L in Segment 8A would be placed parallel to and south of an existing double-circuit 220-kV T/L up to CHSP. At this point, this alternative route would turn east for approximately 1.6 miles, remaining just north of the CHSP boundary, to a new 500-kV switching station. A portion of the existing single-circuit 500-kV T/L within CHSP would be re-routed to tie into the new switching station, which would allow the new double-circuit 500-kV T/L to connect to these existing 500-kV T/Ls to allow power flow to continue on to the Mira Loma Substation. In addition, a portion of the existing 220-kV T/L within CHSP would be re-routed outside of CHSP, paralleling the new 500-kV T/Ls from just west of the CHSP boundary to the new switching station. The re-routed 500-kV and 220-kV T/Ls would proceed

north out of the new switching station and east around raptor ridge for approximately 1.9 miles to reconnect with the existing 500-kV and 220-kV T/Ls.

- **Route C Modified** is similar to the original Route C option discussed above, with the exceptions that (1) the new gas-insulated switching station would be located on Aerojet property approximately 2,500 feet northwest of the location proposed for the original Alternative 4C, (2) transmission line configurations and access roads would be altered to account for relocation of the switching station, and (3) re-routing of the existing single-circuit 500-kV towers in CHSP to the new switching station would occur utilizing double-circuit 500-kV towers. As with the original Route C, this proposed Route 4C Modified would also diverge from the proposed Project Segment 8A at Mile 19.2, as well as re-route the existing 500-kV and 220-kV T/Ls from within CHSP, through a new switching station located north of CHSP.
- **Route D** represents a refinement to Alternative 4 Route A, in which a new double-circuit 500-kV T/L in Segment 8A would be placed parallel to and north of an existing double-circuit 220-kV T/L up to CHSP. At this point, the alternative route would turn east and proceed to follow the northern boundary of CHSP for approximately 4.0 miles, then just east of Bane Canyon the alignment would turn southeast traversing the northeast corner of CHSP for approximately 1.3 miles. The alignment would then turn northeast, again parallel and north of the existing T/Ls, for approximately 0.4 mile before terminating at a new 500-kV switching station located outside of CHSP, just south of the existing 500-kV T/Ls. This switching station would allow the new double-circuit 500-kV T/L to connect to existing 500-kV T/Ls located in this area to provide connections to the Mira Loma Substation.

As with the proposed Project, Alternative 4 (including all five routing options) would traverse approximately 42 miles of NFS lands in the ANF and approximately 6.4 miles of lands that are owned by the USACE.

Alternative 5: Partial Underground Alternative. This alternative would utilize Gas Insulated Line (GIL) technology to place the proposed transmission lines underground along Segment 8A through the City of Chino Hills from approximately S8A MP 21.9 to 25.4 to reduce significant visual impacts and address other community concerns. As with the proposed Project, Alternative 5 would traverse approximately 42 miles of NFS lands in the ANF and approximately 6.4 miles of lands that are owned by the USACE.

Alternative 6: Maximum Helicopter Construction in the ANF Alternative. This alternative was requested by the Forest Service to reduce ground disturbance within the ANF by minimizing new road construction through the use of helicopter construction. Helicopter staging/support areas have been identified in the vicinity of Segments 6 and 11 to provide for helicopter construction activities within the ANF. A total of 1483 new 500-kV towers would be constructed by helicopter under this alternative: 9287 along Segment 6 and 56 along Segment 11. As with the proposed Project, Alternative 6 would traverse approximately 42 miles of NFS lands in the ANF and approximately 6.4 miles of lands that are owned by the USACE. ~~Any detailed changes to the identified helicopter staging/support areas that are identified after publication of the Draft EIR/EIS will be addressed in the Final EIR/EIS.~~ Invasive plant species will be surveyed for and controlled using manual techniques and approved herbicides within the Project area on NFS lands on the ANF. The nature and extent of invasive species control would be further defined in an Operations and Maintenance Plan included in the Special Use authorization issued by the Forest Service.

Alternative 7: 66-kV Subtransmission Alternative. This alternative is comprised of four~~three~~ 66-kV subtransmission line elements, including the following: (1) Undergrounding the existing 66-kV subtransmission line on Segment 7 through the River Commons at the Duck Farm Project (Duck Farm Project) between MP 8.9 and MP 9.9 of Segment 7, as requested by the Board of Supervisors County of Los Angeles to minimize the Project's effects to passive recreation opportunities in the planned Duck Farm Project area; (2) Re-routing and undergrounding the existing 66-kV subtransmission line around the Whittier Narrows Recreation area along Segment 7 (S7 MP 11.4 to 12.025) to provide habitat enhancement for least Bell's vireos as identified by SCE; (3) Re-routing the existing 66-kV subtransmission line through the Whittier Narrows Recreation Area in Segment 7 (S7 MP 12.0 to 13.6) immediately north of the existing 220-kV ROW

to reduce the number of structures required (20-foot expanded ROW required); and (~~43~~) Re-routing the existing 66-kV subtransmission line around the Whittier Narrows Recreation Area along Segment 8A between the San Gabriel Junction at MP 2.2 and S8A MP 3.8 (2 routing options are provided in this area) to provide habitat enhancement for least Bell's vireos, as identified by SCE. As with the proposed Project, Alternative 7 would traverse 42 miles of NFS lands in the ANF; however, this alternative would also traverse roughly 7.9 miles of lands that are owned by the USACE, which is approximately 1.5 miles more USACE lands than the proposed Project or other Project alternatives.

1.2 Purpose and Need

Under the Council on Environmental Quality (CEQ) regulations for NEPA (40 CFR Section1502.13), an EIS must identify the underlying purpose and need to which the lead agency is responding in proposing the alternatives, including the proposed action. Similarly, an EIR must contain a clearly written statement of objectives that include the underlying purpose of the project (Section 15124(b) of the CEQA Guidelines).

The purpose of the proposed TRTP is described in the PEA, which was submitted as part of SCE's application to the CPUC and the USDA Forest Service. As stated by SCE, the purpose of the proposed TRTP is to provide the electrical facilities necessary to integrate levels of new wind generation in excess of 700 MW and up to approximately 4,500 MW in the TWRA (SCE, 2007). Because the proposed TRTP would serve future wind development projects in the TWRA, the potential effects of these future wind projects are addressed in Chapter 6 (Development of the Tehachapi Wind Resource Area) of this ~~Draft~~ EIR/EIS.

In addition to the purpose of the Project described above, SCE identified the following objectives for the Project in the PEA:

- Construct the project to reliably interconnect new wind generation resources in the TWRA, and enable SCE and other California utilities to comply with California's Renewables Portfolio Standard (RPS) in an expedited manner.
- Comply with all applicable reliability planning criteria required by the North American Electric Reliability Council (NERC), the Western Electricity Coordinating Council (WECC), and the CAISO.
- Construct facilities in an orderly, rational and cost-effective manner to maintain reliable electric service, by minimizing service interruptions, during construction.
- Address the reliability needs of the CAISO controlled grid due to projected load growth in the Antelope Valley.
- Address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin.
- Maximize the use of existing T/L right-of-ways in order to minimize effects on previously undisturbed land and resources.
- Minimize environmental impacts, through selection of routes, tower types and locations, while still meeting project objectives.
- Where existing right-of-way is not available, select the shortest feasible route that minimizes environmental impacts.
- Meet project needs in a cost-effective and timely manner.

The CPUC and Forest Service reviewed the Project objectives presented by SCE to determine which of the objectives represented an underlying purpose of the Project and, therefore, could appropriately be used to develop a range of reasonable Project alternatives for analysis in the EIR/EIS. In addition to the purpose of the Project described by SCE to provide electrical facilities needed to integrate new wind generation, the Lead Agencies determined that the Project would also accomplish two other important objectives related to increasing transmission system reliability in the Antelope Valley and resolving transmission constraints south

of Lugo Substation, which is located in Hesperia, California. Therefore, for the purposes of CEQA and NEPA, the Project's three primary objectives are to:

- Provide the electrical facilities necessary to reliably interconnect and integrate in excess of 700 MW[1] and up to approximately 4,500 MW of new wind generation in the TWRA currently being planned or expected in the future, thereby enabling SCE and other California utilities to comply with the California RPS goals in an expedited manner (i.e., 20 percent renewable energy by year 2010 per California Senate Bill 107).[2]
- Further ~~A~~address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley.
- Address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin.

The Lead Agencies determined that the other objectives identified by SCE in the PEA (as listed above) were intended to guide the planning and design of the proposed TRTP and do not represent part of the underlying purpose of the Project.

The Lead Agencies decided it was necessary to assess the purpose and need for the TRTP independent of SCE's application filings (Bagley, 2008). Relevant documents issued by the CAISO, California Energy Commission (CEC), and Federal Energy Regulatory Commission (FERC) were reviewed to assess whether sufficient documentation exists to support the need for the TRTP. Based upon the information contained in these documents, it was determined that there is ample support to justify the need for the TRTP. It was determined that a high probability exists that sufficient generation will be sited in the TWRA to justify the network upgrades proposed. The TRTP is expected to provide the capacity to connect the resources listed in the Tehachapi Generation Queue (totaling 19 projects equaling 4,350 MW as of April 2006[3]) as well as provide additional system reliability to the CAISO-controlled grid. Furthermore, FERC's approval of the CAISO's proposed process of aggregating the interconnection requests of the projects in the Tehachapi Generation Queue for the purpose of establishing the necessary network system upgrades to accommodate all projects in the queue (19 in total) lends regulatory support for development of the TRTP. (Bagley, 2008)

Finally, it was determined that the TRTP will help alleviate concerns that have been raised by the CEC that the present transmission infrastructure is insufficient to permit utilities to meet their RPS requirements. It was independently concluded by the Lead Agencies that the TRTP would help to address several concerns presently facing California's electric industry including the following needs: (1) expand California's existing transmission infrastructure; (2) accommodate large quantities of renewable generation in order to meet the State's RPS goals; and (3) enhance system reliability in the Los Angeles area. As such, the purpose and need for the TRTP, as defined above by the Lead Agencies, has been confirmed independent of SCE's application filings.

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1 The Antelope Transmission Project, which provides 700 MW of transmission capacity, is comprised of three segments: Segment 1 or the Antelope Transmission Project (SCH No. 2005061161) and the Segments 2 & 3 of the Antelope Transmission Project (SCH No. 2006041160) were previously analyzed and approved by the CPUC and Forest Service (Segment 1 only).

2 FERC Order No. 2003 requires all public utilities that own, control, or operate facilities for transmitting electric energy in interstate commerce to provide interconnection service to electric generating facilities having a capacity of more than 20 megawatts.

3 The Tehachapi Generation Queue is consistently changing and has been updated since Ken Bagley's Memorandum Re: Need for the Tehachapi Transmission Project was provided as a reference for this Purpose and Need discussion. For the most recent reflection of projects in the queue, please see Table 2.9-2 (California Independent System Operator - Kern County Wind Generation Queue), which is provided at the end of Chapter 2 (Description of Alternatives, Including the Proposed Project). The queue is also addressed in Chapter 6 (Development of the Tehachapi Wind Resource Area).

Section 1.2.1, below, provides background information regarding the purpose and need of the TRTP. In addition, Sections 1.2.2 and 1.2.3 present information on the Project purpose for the CPUC and Forest Service, respectively, in responding to the applications submitted to these agencies by SCE.

1.2.1 Background

As noted above, the purpose of the proposed TRTP is to provide the electrical facilities that are needed to integrate new wind generation in the TWRA. The Project has also been designed to satisfy the following objectives: (1) accommodate the potential renewable power generation that has been identified in the TWRA, thereby enabling SCE and other California utilities to comply with the California RPS; (2) further address projected load growth in the Antelope Valley; and (3) address South of Lugo transmission constraints. To allow for a better understanding of the purpose and objectives of the TRTP, the following discussion provides additional information regarding the RPS requirements that are currently driving renewable energy development, SCE's obligation to provide transmission capacity to the TWRA, needed improvements to SCE's transmission system, and the roles of the CPUC and USDA Forest Service as the CEQA and NEPA Lead Agencies.

Renewables Portfolio Standard (RPS) Requirements

While the TRTP is proposed to integrate new wind generation in the TWRA, the need for this Project arose from the mandates of the California RPS. The California RPS was established in 2002 by Senate Bill 1078, and requires investor-owned utilities, including retail sellers of electricity such as SCE, to increase their sale of electricity produced by renewable energy sources (such as wind) by at least one percent per year, achieving 20 percent by 2017. These requirements were accelerated by the passage of Senate Bill 107 to be consistent with the Energy Action Plan (EAP) adopted in 2003. The EAP, adopted by the CPUC, CEC, and the now defunct California Power Authority, pledged that the agencies will accelerate RPS implementation to meet the 20 percent goal by 2010 instead of 2017 (CEC, 2007).

The Public Resources Code (Section 25740) and the Public Utilities Code (Section 399.15) have been amended to include the most recent RPS target requiring investor-owned utilities to procure 20 percent of their total retail sales from renewable energy resources by 2010. ~~However~~The Draft EIR/EIS described that a more aggressive RPS goal of ~~procuring~~ 33 percent renewable energy by the year 2020 ~~is currently~~had been proposed by the State~~, and Governor Schwarzenegger has directed the CEC to study the feasibility of this goal (CEC, 2007)~~. In support of that 33 percent target, the California Renewable Energy Transmission Initiative (RETI) and Executive Order S-14-08 (issued November 17, 2008) include goals to identify transmission requirements necessary to achieve a renewable energy supply of 33 percent by the year 2020.

The initiation of the proposed TRTP pre-dates the initiation of the RETI process; however, because the RETI effort is directly relevant to the purposes of TRTP and is supervised in part by the CPUC, a description of the RETI is provided here with regards to the State of California's renewable energy goals. RETI is a state-wide initiative supervised by several collaborating entities, including the CPUC, CEC, CAISO, and Publicly-Owned Utilities. As described by the CEC, primary functions of RETI include: operate as a stakeholder planning collaborative and involving a broad range of participants to build support for renewable energy and related transmission development; work within CAISO planning processes, including development of modifications to that planning process in compliance with Order No. 890 of the Federal Energy Regulatory Commission; support CEC policy development, transmission planning, transmission corridor designation, and power plant siting in support of renewable energy; and work with the publicly-owned utilities (POUs), investor-owned utilities (IOUs), and developers (CEC, 2008; RETI Coordinating Initiative, 2009).

Executive Order S-21-09, which was issued on September 15, 2009, further builds on the commitment to accelerate the State's renewable energy standard by directing the California Air Resources Board (CARB) to adopt a regulation consistent with the 33 percent renewable energy target established in Executive Order S-14-08 by July 31, 2010 (Office of the Governor, 2009). In developing the regulation, CARB may consider different approaches that would achieve the objectives of the Executive Order and may increase the target and accelerate and expand the time frame based on a thorough assessment of such factors as technical feasibility, system reliability, cost, greenhouse gas emissions, environmental protection or other relevant factors.

Tehachapi Wind Resource Area (TWRA)

As a crucial step in meeting the California RPS goals, the CPUC must explore possibilities for the removal of constraints on the transmission of electricity from its point of generation to its point of use, referred to as the "load center". In order for SCE and other investor-owned utilities to satisfy the target goal of procuring 20 percent renewable energy by 2010, new transmission facilities are required to interconnect remote areas of high renewable power generation, such as the TWRA, to areas of high load, including portions of the Los Angeles and San Bernardino metropolitan areas that are within the SCE service area.

The TRTP would provide the necessary transmission network to interconnect proposed wind generation in the TWRA, which is considered one of the largest resources for wind energy in California (TCSG, 2005). The CEC has estimated that there is approximately 4,500 MW of potential wind development in the Tehachapi and Antelope Valley region (TCSG, 2006). In order to assess the ability of this region to contribute toward meeting the State's mandated RPS goals, the CPUC issued Decision 04-06-010 which ordered the formation of a collaborative study group to develop a comprehensive transmission development plan for wind energy in the Tehachapi area (CPUC, 2004). This decision also required SCE to prepare and file a certificate of public convenience and necessity (CPCN) application[4] for Tehachapi transmission upgrades in coordination with the recommendations of the collaborative study group (CPUC, 2004).

In conjunction with the Tehachapi Collaborative Study Group (TCSG), SCE has identified a phased development plan for transmission infrastructure in the TWRA (TCSG, 2006). The purpose of this phased transmission plan, called the Tehachapi Transmission Project (TTP), is to accommodate the generation of renewable wind energy in the Tehachapi region. The TTP is being implemented in separate phases, where the proposed TRTP is Phase 3. The approved Antelope-Pardee 500-kV Transmission Project or Antelope Transmission Project Segment 1 represents Phase 1 of the TTP, while the approved Antelope Transmission Project Segments 2 & 3 represents Phase 2 of the TTP. The CPCN applications for each of these three phases of the TTP were submitted separately for consideration by the CPUC over a period of several years and, as such, separate environmental analyses have been prepared to analyze and disclose the potential environmental effects of constructing, operating, and maintaining each of the three phases.

According to the CEC's 2005 Integrated Energy Policy Report (IEPR), "California needs major investments in new transmission infrastructure to interconnect with remote renewable resources in the Tehachapi and Imperial Valley areas, without which it will not be able to meet its RPS targets" (CEC, 2005). California RPS targets are required by Public Utilities Code Section 399.14. The IEPR further explains that the "Tehachapi area transmission projects" proposed by SCE, which include the proposed TRTP, are critical in order to facilitate

[4] The CPUC is charged with regulating privately owned utility infrastructure. As set forth in the California Public Utilities Code, no investor-owned utility may construct or expand a transmission line or generating facility without obtaining a CPCN from the CPUC (PUC Sections 1001 to 1013; 1091 to 1102).

the development of renewable energy resources required by the State RPS targets and recommends that these phases of the TTP should move forward "expeditiously."

Projected Load Growth and Transmission Constraints

In addition to contributing toward RPS compliance, the TRTP would satisfy the Project objectives of improving SCE's transmission system reliability and mitigating existing transmission constraints. The Antelope Valley area has experienced above-average electrical demand growth and is forecast to continue above-average growth of about five percent per year. SCE currently forecasts that the bulk transmission system facilities in this area will experience reliability problems by 2011. Currently, operating procedures that are used to mitigate reliability problems during heavy load conditions are not considered sufficient to mitigate thermal overload on the existing Antelope-Mesa and Antelope-Vincent 220-kV T/Ls. As part of SCE's development plan for the Tehachapi area, the proposed TRTP would include transmission upgrades north of Vincent Substation that would ~~interconnect and transmit the electrical power from new generation resources in order to both~~ reliably serve the load requirements in the Antelope Valley as well as~~for~~ interconnect and transmit the electrical power from new generation resources ~~the Antelope Valley and deliver power~~ to Vincent Substation.

The Project would also improve the reliability of the CAISO-controlled transmission network within the South of Lugo transmission corridor, which is an existing transmission path between the northern portion of SCE's service territory and the Los Angeles Basin. The current network configuration transports power flowing from northern California and southern Nevada to Lugo Substation. The power is then transported to load centers in the Los Angeles Basin via three 500-kV T/Ls that run south from Lugo Substation through the Cajon Pass along the I-15 freeway and terminate at Mira Loma Substation. The Cajon Pass is subject to annual forest fires that affect collocated transmission lines, as demonstrated in 2002 when all three of the existing 500-kV T/Ls were lost due to a forest fire. SCE also anticipates that the South of Lugo transmission corridor will exceed its current transfer capability limitation, creating a bottleneck within the CAISO transmission network. To relieve this bottleneck and to mitigate the loss of transmission from future forest fires, the proposed TRTP would provide additional transmission paths into Mira Loma Substation and would increase the substation's total import capability from 6,400 MW to 7,400 MW.

Executive Order 13212

In response to a clearly identified need to improve energy transmission infrastructure throughout the country, President George W. Bush issued Executive Order 13212 on May, 18, 2001, in order to encourage the expedited and environmentally responsible development of transmission infrastructure. This Executive Order consists of four sections as follows: Section 1 (Policy); Section 2 (Actions to Expedite Energy-Related Projects); Section 3 (Interagency Task Force); and Section 4 (Judicial Review). With regard to the expedited agency review of permits and other relevant documents (including environmental analyses) Section 2 states the following:

> *For energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections. The agencies shall take such actions to the extent permitted by law and regulation, and where appropriate.* (CEQ, 2001)

In observance of this Executive Order and to the greatest extent feasible, the Lead Agencies for the proposed TRTP have worked in coordination with the Project proponent (SCE) to fully analyze the proposed Project and alternatives in compliance with NEPA and CEQA and to expedite the environmental review process.

1.2.2 California Public Utilities Commission

Pursuant to Article XII of the Constitution of the State of California, the CPUC is charged with the regulation of Investor-Owned Utilities (IOUs) operating within California, including the Project proponent, SCE. The CPUC is the Lead Agency for CEQA compliance in evaluation of SCE's proposed Project. In accordance with CEQA requirements, the CPUC's purpose in evaluating this EIR/EIS is to determine the adequacy of the document according to CEQA and to provide certification of CEQA compliance if it is determined that the EIR/EIS satisfies all CEQA requirements.

After the evaluation and certification of the EIR/EIS, the CPUC will also respond to SCE's application for a Certificate of Public Convenience and Necessity (CPCN, Application A.07-06-031), as filed on June 29, 2007. Prior to taking action to approve SCE's CPCN application, the CPUC must determine that the proposed Project is consistent with the CPUC's purpose and objectives for granting CPCNs, including, where applicable, compliance with CPUC General Order 131-D. This order states that no electric public utility shall construct electric transmission line facilities designed for operation at 200 kV or more without the CPUC having first found that the facilities are necessary "to promote the safety, health, comfort, and convenience of the public, and that they are required by the public convenience and necessity." In addition, the CPUC seeks to facilitate the achievement of the State of California's goals for the distribution of renewable energy generated by IOUs in California. As a crucial step in fulfilling this purpose, the CPUC must explore possibilities for the removal of constraints on the transmission of electricity from its point of generation to its point of use, such as would be facilitated by the proposed Project. In connection with this purpose, the CPUC must also attempt to further the implementation of other State policies and programs related to power generation and transmission.

The CPUC has assigned Administrative Law Judge (ALJ) Victoria Kolakowski to prepare the Proposed Decision and oversee the hearings on the proposed Project, and Commissioner Dian Gruenich is the Assigned Commissioner for the CPCN application. The ALJ, in accordance with her Scoping Memo, will hold Evidentiary Hearings on the CPCN application and expects to issue a Proposed Decision on the Project after release of the Final EIR/EIS. The ALJ's Proposed Decision and the Evidentiary Hearings will cover issues of project need, project cost, and other considerations.

1.2.3 USDA Forest Service

SCE filed an application for a Special Use authorization with the USDA Forest Service on June 29, 2007, seeking permission for construction, operation, and maintenance of the proposed transmission facilities across NFS lands managed by the ANF. As the federal Lead Agency, the Forest Service must respond to SCE's Special Use application by providing a decision regarding issuance of a Special Use authorization. The Forest Service is responsible for compliance with the requirements of NEPA, Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), the Forest Land Management Plan, and the Forest Service Handbooks. The Forest Service Handbook Section 2709.11, Chapter 10, defines the Forest Service's role in authorizing Special Use authorizations across NFS lands. Upon receipt of a Special Use application, the authorized officer of the Forest Service will determine whether the proposal meets screening criteria requirements. A proposal that satisfies the initial and second-level screening criteria can be accepted as a formal written application which is subject to an environmental analysis pursuant to NEPA. A Special Use authorization may be issued once all NEPA prerequisites have been met and the administrative appeal process has expired without an appeal being filed, or if an appeal has been filed, it has been resolved through all levels (FSH 2709.11, Chapter 10, Sections 12 through 14).

The Forest Service will review SCE's Special Use application for consistency with the governing 2005 Forest Plan and with other policies and regulations relevant to the management of NFS lands. The intent and purpose of the Forest Service in reviewing SCE's application is to implement the policies and objectives of the Forest Plan and to ensure that any action on NFS lands, as authorized by a Special Use authorization, is in compliance with the Forest Plan. The Forest Service may deny authorization for Special Uses for a number of different reasons, such as if "the proposed use would be inconsistent or incompatible with the purpose(s) for which the lands are managed, or with other uses," or the proposed use "would not be in the public interest" (36 CFR 251.5).

The Forest Service is required to balance multidisciplinary objectives in the decision-making process for Special Use authorizations. An amendment to the 2005 Forest Plan is required for any action that is included under the Special Use authorization but would otherwise be incompatible with the Forest Plan (per 36 CFR 219.10(e)). Therefore, in evaluation of the proposed Project, the Forest Service must identify all Forest Plan amendments that would occur in conjunction with approval of the proposed Project's Special Use authorization. Specific Forest Plan amendments that are expected to be required under the proposed Project or an alternative to the Project are described in the following section.

USDA Forest Service Purposes in Analyzing the Proposed Action

As the lead federal agency, the USDA Forest Service has identified the following agency-specific purposes (objectives) in analyzing the proposed Project and alternatives. This agency-specific definition better identifies the context in which the agency may authorize this type of project.

- Minimize adverse environmental effects to NFS lands, such as impacts to the following resources: visual, biological, cultural, recreation, air, soil, and water, among others as applicable
- Minimize the effects of urbanization, or negative effects to open space and natural settings, on the Angeles National Forest
- Ensure that future Forest management activities such as wildland fire fighting, among others, are not detrimentally affected by the location and/or design of the proposed action
- Ensure that the location of the transmission line on NFS lands maximizes the accommodation of future utility needs

Pursuant to the Federal Land Policy and Management Act (FLPMA) of 1976 (as amended), the Forest Service's need for action is to respond to applications from SCE for a Special Use authorization to construct, maintain, and use transmission lines (and ancillary improvements) through the ANF. The Forest Service will consider the application for use of NFS lands to ensure that the proposed action is in the public interest and is appropriate based on the governing land management plan. In addition, in compliance with Executive Order 13212, which is described above in Section 1.2.1 (Background), the USDA Forest Service will work in coordination with the CPUC and SCE to assess the proposed Project in an expeditious manner, to the maximum extent feasible without jeopardizing the integrity of this analysis, thereby ensuring that transmission needs are met with minimal environmental impacts.

1.3 Agency Use of this Document

When applicable, both CEQA and NEPA encourage agencies to prepare a single joint environmental analysis/assessment document, because the environmental review process under both laws are similar and somewhat parallel. Therefore, for the purposes of this proposed Project, the CPUC (CEQA Lead Agency) and the USDA Forest Service (NEPA Lead Agency) have entered into a Memorandum of Understanding (MOU) to jointly direct the preparation of this EIR/EIS, thereby serving the permitting and decision-making

requirements of both agencies. However, the CPUC and the Forest Service will take separate decision actions on the EIR/EIS prepared for the proposed Project.

California Public Utilities Commission

The CPUC is responsible for issuing a decision on SCE's CPCN application, approval of which is required prior to Project construction, operation, and maintenance (see Section 1.2.2 above). The CPUC will make the decision to approve or deny SCE's CPCN application after reviewing the Final EIR/EIS for consistency with CEQA requirements. If the Final EIR/EIS shows that the proposed Project or an alternative to the proposed Project would have significant and unavoidable (not mitigable) impacts but the CPUC still approves the CPCN, then the CPUC's decision on the application must include a "Statement of Overriding Considerations," which would explain the reasons for the application's approval.

USDA Forest Service

The USDA Forest Service is responsible for issuing a decision to approve or deny the Special Use authorizations and Forest Plan amendments that are required in order to construct and operate/maintain the proposed Project on NFS lands in the ANF. Using the Final EIR/EIS as a basis for decision-making, the Regional Forester of the Pacific Southwest Region, USDA Forest Service, will make a decision on whether to authorize the required 50-year term Special Use authorization for the construction, operation, and maintenance of the proposed 500-kV transmission lines and ancillary improvements on NFS lands before any Project construction activities would be permitted to begin on NFS lands.

Following completion of the Final EIR/EIS, the Forest Service will review the document for consistency with NEPA and will issue a Record of Decision (ROD) to document the decision to either approve or deny the required 50-year term Special Use authorization for the Project. The ROD will also include the Forest Service's decision on any amendments that will be required to the governing 2005 Forest Plan in order for Project construction, operation, and maintenance to occur. The following FLMP amendments are expected to be necessary prior to implementation of the proposed Project or an alternative to the Project:

- Scenic Integrity Objectives (SIOs) along the existing or proposed utility corridor would be changed; and
- ~~Forest Standard related to the Pacific Crest National Scenic Trail (S1) would be modified, as the proposed transmission facilities would adversely impact foreground views; and~~
- Forest Standard addressing Riparian Conservation Areas (RCAs) would be modified, as the construction and/or improvement to new spur roads and existing access roads on NFS lands would adversely affect these areas.

The details of these amendments to the Forest Plan are provided as part of the description of each alternative in Section 2 of this EIR/EIS. The ROD is subject to administrative review and may be appealed under 36 CFR 215.

Other Agencies

In addition to the CPUC and the USDA Forest Service, several other State and federal agencies will also use the Final EIR/EIS in their decision-making processes, particularly as relevant to the issuance of permits for Project construction, operation, and maintenance. As Alternative 4 would traverse State Park lands within the Chino Hills State Park (CHSP), construction, operation, and maintenance of this alternative would require approval from the California Department of Parks and Recreation. However, the California Department of Parks and Recreation may only issue permits for projects that are in compliance with the State Park general plans, and Alternative 4 would conflict with the CHSP General Plan (see discussion in Section 3.15).

Consequently, prior to issuing any approval for Alternative 4, the California Department of Parks and Recreation would need to develop an amendment to the CHSP General Plan and that amendment would need to be submitted to the California State Park and Recreation Commission for review and approval. Therefore, both the Department of Parks and Recreation and the State Park and Recreation Commission would be responsible agencies under CEQA for Alternative 4. In addition, coordination with the California Department of Toxic Substances Control (DTSC) would be required for Routes C, C Modified, and D of Alternative 4 because those routes traverse a portion of the Aerojet Chino Hills Facility that is the subject of Corrective Action for the cleanup of explosive chemicals, perchlorate, uranium, and ordnance. As part of the Feasibility Study process for the Corrective Action for the facility, DTSC will select a proposed future land use for the site and that future land use selection would need to allow the construction of transmission infrastructure in order for Route 4C, 4C Modified, or 4D to be implemented.

Table 1-1 provides a list of the anticipated federal and State permits and approvals that would be required for the proposed Project and alternatives, including those that would be issued by the Lead Agencies. Please note that CEQA review is only required for State or local approvals that are considered discretionary in nature.

Table 1-1. Required Federal and State Permits and Approvals

Agency	Permit / Approval / Consultation
FEDERAL	
USDA Forest Service	A 50-year term Special Use authorization for the construction, operation, and maintenance of the proposed 500-kV transmission line and ancillary improvements on NFS lands; and amendments to the 2005 Forest Plan to ensure that all actions approved under the Special Use authorization are consistent with management direction.
US Army Corps of Engineers (USACE)	Amendment or replacement of the existing easement across lands owned by the USACE.
	Clean Water Act Section 404 permit, for Project activities that would result in discharge of fill or dredged material in and adjacent to Waters of the United States; a CWA Section 401 Water Quality Standards Certification from the Water Resources Control Board is a prerequisite for USACE issuance of a CWA Section 404 permit.
US Fish and Wildlife Service	Endangered Species Act Biological Opinion, if Project activities would result in adverse effect on a federally threatened, endangered, proposed, petitioned, or candidate species, or if Project activities would impact occupied designated critical habitat.
Federal Communications Commission	Licenses for new microwave paths.
Federal Aviation Administration	Permits for new microwave towers.
STATE/REGIONAL	
California Public Utilities Commission	Certificate of Public Convenience and Necessity (CPCN).
California Department of Parks and Recreation	Permit for construction, operation, and maintenance of Alternative 4 across Chino Hills State Park (CHSP) lands. Permits are only issued for projects that comply with the State Park general plans and, therefore, the Department of Parks and Recreation is responsible for developing any necessary amendment(s) to the CHSP General Plan, as subject to review and approval by the California State Park and Recreation Commission (see below).
California State Park and Recreation Commission	Review and approve any necessary amendment(s) to the CHSP General Plan that are submitted by the California Department of Parks and Recreation (Alternative 4 only).
California Department of Toxic Substances Control	Approval of future land use(s) for the Aerojet Chino Hills Facility, which is currently undergoing Corrective Action. Project access roads may also need to traverse the facility's Open Burn/Open Detonation Unit, which is currently undergoing closure (Alternative 4 only).
California Department of Fish and Game	Streambed Alteration Agreement (per Section 1602 of the California Fish and Game Code) for effects to the bed, channel, or bank of rivers, streams, or lakes.
	Incidental Take Permit (per Section 2081 of the California Fish and Game Code) for activities that would result in the take of species under the California Endangered Species Act.
California Air Resources Board	Portable Engine Registration for specified non-mobile portable engines.

Table 1-1. Required Federal and State Permits and Approvals

Agency	Permit / Approval / Consultation
Antelope Valley Air Quality Management District	Air Quality Permits for portable engines greater than 50 hp not registered under the CARB Portable Engine Registration Program.
South Coast Air Quality Management District	Air Quality Permits for portable engines greater than 50 hp not registered under the CARB Portable Engine Registration Program.
Kern County Air Pollution Control District	Air Quality Permits for portable engines greater than 50 hp not registered under the CARB Portable Engine Registration Program.
State Water Resources Control Board	National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activities and Clean Water Act Section 401 certification.
California Department of Water Resources	Encroachment Permit required to traverse the California Aqueduct.
California Department of Parks and Recreation, State Historic Preservation Officer	Consultation and Memorandum of Understanding (MOU) per Section 106 of the National Historic Preservation Act.
California Department of Transportation, State and Local Project Development	Approval for private facilities running parallel to and falling in the rights-of-way of conventional highways with franchise rights from local agencies. Encroachment permits for any nonstandard use of State highway facilities. Transportation permits for heavy or oversized loads.
Division of Occupational Safety and Health (formerly CAL OSHA)	Construction permit (for construction of trenches or excavations which are five (5) feet or deeper and into which a person is required to descend).

No local discretionary approvals (e.g., use permits) are required of SCE because the CPUC has preemptive jurisdiction over the construction, operation, and maintenance of SCE facilities in California. This CPUC authority does not preempt the authority of special districts, such as local air pollution control districts, or other State agencies or the federal government. Although local use approvals are not required, SCE would still be required to obtain all ministerial building and encroachment permits from local jurisdictions per the CPUC's General Order 131-D, which requires SCE to comply with local building, design, and safety standards to the greatest degree feasible to minimize Project conflicts with local conditions. County jurisdictions from which SCE may be required to obtain ministerial building and encroachment permits for the proposed Project or a Project alternative include the following: Kern County, Los Angeles County, San Bernardino County, and Orange County. In addition, city jurisdictions from which SCE may be required to obtain permits for the proposed Project or a Project alternative include the following:

- City of Baldwin Park
- City of Brea
- City of Chino
- City of Chino Hills
- City of Diamond Bar
- City of Duarte
- City of Industry
- City of Irwindale
- City of La Cañada Flintridge
- City of La Habra Heights
- City of Lancaster
- City of Monrovia
- City of Montebello
- City of Monterey Park
- City of Ontario
- City of Palmdale
- City of Pasadena
- City of Pico Rivera
- City of Rosemead
- City of San Gabriel
- City of South El Monte
- City of Temple City
- City of Whittier

The county and city jurisdictions listed above would be traversed by the proposed Project or a Project alternative. SCE may be required to obtain different types of ministerial and/or encroachment permits from various county and/or city agencies. For instance, the County of Los Angeles Public Works Department would likely require that SCE obtain permits for road use, excavation activities (for the cutting of public roadways), encroachment (of the public ROW), and construction activities. Similarly, the City of Los Angeles Department of Water and Power (LADWP) is expected to require a permit for the crossing of LADWP transmission lines and aqueducts. Other city jurisdictions, including those listed above, are expected to require encroachment

permits, or similar authorization(s) for work conducted in the public ROW. As with the CPUC and the USDA Forest Service, these local permit-issuing agencies would use information provided in the Final EIR/EIS during their decision-making processes regarding permit issuance.

1.4 Overview of the Environmental Review Process

When a proposed project requires compliance with both CEQA and NEPA, the Lead Agencies may decide to collaborate in the preparation of a joint EIR/EIS document, as is the case with the proposed TRTP. In accordance with CEQA and NEPA requirements, the EIR/EIS must be completed before a decision to approve or deny the project can be made by the Lead Agencies which, in this case, are the CPUC (CEQA Lead Agency) and the USDA Forest Service (NEPA Lead Agency). The EIR/EIS must provide the following information: disclosure of the Project's expected impacts on the environment; recommended measures to reduce or avoid adverse impacts; and analysis of a reasonable range of feasible alternatives. The purpose of this process is to inform the public about the impacts of the Project and to provide agency decision-makers with vital Project information to aid in their decision(s) regarding Project approval. The basic contents of an EIR/EIS include:

- A description of the proposed Project/Action;
- A statement of objectives (per CEQA) and Purpose and Need for the action (per NEPA);
- A description of existing conditions in the Project area;
- An analysis of the potential environmental impacts of the proposed project and alternatives;
- Recommendations of mitigation measures that would reduce or avoid adverse impacts (for impacts identified under the proposed Project as well as alternatives to the Project); and
- A discussion of other required environmental topics, including adverse environmental effects that cannot be avoided, irreversible and irretrievable commitment of resources, growth-inducing effects, and the relationship between short-term use and long-term productivity of the environment. .

In preparing a joint EIR/EIS, individual requirements of both CEQA and NEPA must be met during the environmental review process. The State and federal processes begin in similar ways, with the filing of specified announcements that an environmental analysis is being prepared. Under CEQA, the EIR process is initiated by filing a Notice of Preparation (NOP) with the California State Clearinghouse in the Office of Planning and Research, thus indicating that a Draft EIR will be prepared. Similarly, under NEPA, the EIS process is initiated by publishing a Notice of Intent (NOI) to prepare an EIS in the *Federal Register*. These notices initiate a 30-day period during which public and agency input is solicited on the scope of issues and concerns that should be addressed in the EIR/EIS. As part of this scoping process, public meetings are conducted to present information on the proposed Project and to receive public input on the Project.

When the Draft EIR/EIS has been completed, it is distributed for public review and comment in accordance with the requirements of both CEQA (CEQA Guidelines §15087) and NEPA (NEPA Regulations 40 CFR 1506.6). Copies of the Draft EIR/EIS are also submitted to the U.S. Environmental Protection Agency (USEPA) (40 CFR 1506.9) and the California State Clearinghouse, as well as responsible, trustee, and cooperating agencies as defined by CEQA and NEPA. A Notice of Availability (NOA) of the Draft EIR/EIS is published in the *Federal Register* by the USEPA (40 CFR 1506.10). The NOA is also published in local newspapers and with the county clerk(s), per CEQA Guidelines §15087. Publishing the NOA initiates a public review and comment period for the Draft EIR/EIS that is typically 45 days in length. All comments and concerns regarding the Draft EIR/EIS must be received by the Lead Agencies before the end of the 45-day period in order to be considered in the Final EIR/EIS. During the 45-day comment period following publication of the NOA, a public hearing may be conducted to obtain public comment on environmental issues

addressed in the Draft EIR/EIS. The date, time, and location of any public hearings, should they occur, will be announced ~~in the *Federal Register* and~~ in local newspapers.

Responses to substantive comments received on the Draft EIR/EIS will be prepared by the Lead Agencies and published in the Final EIR/EIS in accordance with CEQA Guidelines §15088, NEPA Regulations 40 CFR 1502.9, and Forest Service guidelines FSH 1909.15-2008-1.24.1. The Final EIR/EIS may present additional information in response to comments made on the Draft EIR/EIS and may include minor corrections to the Draft EIR/EIS that were discovered during the comment period, which may include the following: modification to the proposed Project or Project alternatives; development and evaluation of alternatives not previously considered by the agency; improvement or modification of the Project analysis as needed; factual corrections; and/or explanation as to why certain comments do not warrant further agency response. If the changes are minor and do not rise to a level requiring preparation of a Supplement to an EIR (CEQA §15163) or a Supplemental EIS (NEPA 1502.9(c)(1)) a Final EIR/EIS is prepared. Once the Final EIR/EIS is complete, another NOA is published in the *Federal Register* by the USEPA.

After the Final EIR/EIS has been reviewed and approved by the Lead Agencies, the federal Lead Agency prepares a Record of Decision (ROD) in accordance with NEPA requirements (40 CFR 1505.2). The ROD provides a public record explaining why the federal Lead Agency chose a particular course of action. Although the ROD typically cannot be approved until at least 30 days after the NOA for the Final EIR/EIS is published in the *Federal Register*, 40 CFR 1506.10(b)(2) provides an exception for Lead Agencies which have a formal appeal process, including the USDA Forest Service. Therefore, in this case the deciding officer may sign the ROD at the same time the NOA for the Final EIR/EIS is published in the *Federal Register*. The federal Lead Agency's approval decision, as documented in the ROD, cannot be implemented any sooner than 50 days after the date the legal notice is published in the newspaper of record publicizing the decision of the Lead Agency (36 CFR 215.7; 36 CFR 215.9 (a)).

Similar to the required federal process, CEQA Guidelines §15090 requires that the CEQA Lead Agency review the Final EIR/EIS and certify the document's adequacy under CEQA prior to taking any action to approve the Project or an alternative to the Project. If the Final EIR/EIS determines that the proposed Project would lead to one or more significant environmental effects that cannot be mitigated to a less-than-significant level, the Lead Agency must make specific findings regarding its approval of the Project (CEQA Guidelines §15091). These findings must either state that alterations have been made to the Project to avoid or substantially reduce each significant impact, or that specific economic, legal, social, technological, or other considerations make mitigation of a significant impact infeasible.

If the CEQA Lead Agency decides to approve the proposed Project or an alternative to the proposed Project even though significant unavoidable impacts would occur, the Lead Agency must prepare and adopt a Statement of Overriding Considerations (SOC), which explains why the significant and unavoidable environmental impacts associated with the project are acceptable when compared to the benefits of the proposed Project or an alternative to the Project (CEQA Guidelines §15093). If an SOC is required, it must be prepared and adopted before the Lead Agency takes action to approve the proposed Project or selected alternative. The CEQA Lead Agency must also file a Notice of Determination (NOD) with the California State Clearinghouse within five working days after approval of a Project for which an EIR was prepared (CEQA Guidelines §15094).

The proposed Project or approved alternative to the Project cannot be initiated before the EIR/EIS is finalized, the CEQA-specific findings (including the SOC) are approved, the NEPA-required ROD is signed and approved, and an approval is granted by the CEQA Lead Agency. In addition, various other agencies may

need to provide approvals prior to Project initiation, as discussed above in Section 1.3 (Agency Use of this Document). These agencies will utilize the information contained in the Final EIR/EIS in making their decisions regarding permits and approvals required for the Project.

1.5 Reader's Guide to this Document

This Reader's Guide section includes a description of documents that are incorporated by reference in the EIR/EIS (Section 1.5.1), as well as a discussion of how information available in the EIR/EIS is presented and how to locate specific types of information in the document (Section 1.5.2).

1.5.1 Incorporation by Reference

The Proponent's Environmental Assessment (PEA) for the proposed TRTP, as prepared by SCE and submitted as part of Application No. A.07-06-031 contains Project information that is incorporated by reference in the EIR/EIS, as appropriate depending upon the specific environmental issue area. The full PEA is available for public review via the Internet at the following address: ftp://ftp.cpuc.ca.gov/gopher-data/environ/tehachapi_renewables/TRTP.htm.

Also incorporated by reference into this EIR/EIS are a series of Specialist Reports, which include detailed technical environmental analyses prepared for certain resource/issue areas during the EIR/EIS analysis process. Due to the nature of certain resource/issue areas that are less technical than others, Specialist Reports were not required for all sections. As such, Specialist Reports were prepared for the following resource/issue areas: Air Quality; Biological Resources (including noxious weed and avian risk analyses); Riparian Conservation Areas; Cultural Resources; Geology, Soils, and Paleontology; Hydrology and Water Quality; and Visual Resources. These Specialist Reports are available for review upon request, as well as ~~at the Project repository sites (please see the Project's Notice of Preparation (NOP), Appendix B, for a complete list of repository sites),~~ on the Project website (ftp://ftp.cpuc.ca.gov/gopher-data/environ/tehachapi_renewables/TRTP.htm), and through the Lead Agencies (CPUC and USDA Forest Service).

The environmental resource/issue area analyses presented in the Draft EIR/EIS draw upon technical analyses provided in the Specialist Reports as necessary. In addition, each EIR/EIS issue area analysis presents information required by CEQA and NEPA which, as previously described, includes the following: disclosure of expected impacts on the particular Issue Area; recommended mitigation measures to reduce or avoid significant impacts; and analysis of a reasonable range of feasible alternatives to the proposed Project. Documents and reports which are incorporated by reference in the Draft EIR/EIS include the following:

SCE (Southern California Edison). 2007. *Proponent's Environmental Assessment, Tehachapi Renewable Transmission Project (TRTP)*. June 27, 2007.

Aspen (Aspen Environmental Group). 2009. *Tehachapi Renewable Transmission Project Riparian Conservation Area Report*. ~~January~~August.

Aspen. 2009~~8~~. *Tehachapi Renewable Transmission Project: Air Quality Specialist Report*. ~~December~~September.

Aspen. 2009. *Tehachapi Renewable Transmission Project Hydrology and Water Quality Specialist Report*. August.

Aspen and H.T. Harvey & Associates. 2009~~8~~. *Tehachapi Renewable Transmission Project: Biology Specialist Report*. ~~December~~September.

Applied Earthworks. 2009~~8~~. *Tehachapi Renewable Transmission Project: Cultural Resources Specialist Report*. ~~December~~September. (Confidential)

GTC (Geotechnical Consultants, Inc.), prepared under subcontract to Aspen Environmental Group. 2009~~8~~. *Tehachapi Renewable Transmission Project: Geology, Soils, and Paleontology Specialist Report*. ~~December~~August.

Anderson, Lee Roger. 2009~~8~~. *Tehachapi Renewable Transmission Project: Visual Resources Specialist Report*. ~~December~~September.

As noted above, SCE's PEA for the proposed Project is incorporated by reference in this ~~Draft~~ EIR/EIS. It is important to note that the PEA was used extensively to develop the proposed Project description presented in Chapter 2 (Description of Alternatives) of this EIR/EIS. In addition, information that was presented in the PEA for the proposed Project but was also applicable to Project alternatives, such as setting descriptions and construction methodologies, was also used in the development of Project alternatives.

1.5.2 EIR/EIS Organization

In compliance with CEQA and NEPA requirements as described in the preceding sections, this EIR/EIS includes the following sections:

- **Executive Summary.** A summary description of the proposed Project, the alternatives, and their respective environmental impacts are included. A summary table lists impacts and the associated mitigation measures for each significant impact identified for the proposed Project and alternatives.
- **Chapter 1: Introduction.** A brief overview of the proposed Project and alternatives to the Project, purpose of and need for the Project, and the public agency use of the EIR/EIS are described.
- **Chapter 2: Description of Alternatives, including the ~~and~~ Proposed Project.** Detailed descriptions of the proposed Project/Action and alternatives to the proposed Project are presented.
- **Chapter 3: Environmental Analysis.** A detailed description of the affected environment and regulatory framework is presented for each technical issue area. Each of the technical issue area sections also provide the detailed analysis of proposed Project impacts and impact of the Project alternatives in equal level of detail. Mitigation measures are presented that would help reduce or minimize any potential impacts identified as resulting from implementation of the Project.
- **Chapter 4: Comparison of Alternatives.** The process for selection of proposed Project alternatives is described along with the steps and rationale for elimination of certain alternatives from further analysis. Also, a comparison of the proposed Project and alternatives are provided.
- **Chapter 5: Other Environmental and Regulatory Considerations.** This section addresses the various permitting and compliance requirements should the Project be implemented. The long-term implications of the action are also discussed. This chapter also discusses concerns related to magnetic fields, terrorism, and energy conservation.
- **Chapter 6: Development of the Tehachapi Wind Resource Area (TWRA).** As mentioned above in Section 1.2 (Purpose and Need) the potential effects associated with development of wind generation projects in the TWRA are addressed in this EIR/EIS because the proposed Project would meet energy transmission needs for such future projects. Therefore, this chapter addresses the TWRA through discussion of the following: elements of construction and operation of wind turbines; existing environmental setting; applicable rules, regulations, and standards; and potential environmental impacts associated with wind development. This chapter also includes a summary of the expected environmental impacts associated with two proposed wind projects: the Alta-Oak Creek Mojave Project, and the PdV Wind Energy Project, both of which are located in the TWRA.

- **Chapter 7: Consultation and Coordination.** A description of the environmental review process and public participation program for the EIR/EIS is provided.
- **Chapter 8: References.** This chapter provides a listing of research conducted in preparation of the EIR/EIS.
- **Chapter 9: Glossary/Acronyms.** Definitions to terms used in the EIR/EIS are provided.
- **Chapter 10: Index.** An index of important or useful subjects is provided for ease in locating information in the EIR/EIS.
- **Appendices.** Technical background information used in preparation of the EIR/EIS is included.
    - Appendix A: Alternatives Screening Report
    - Appendix B: Notice of Preparation, Notice of Intent, and Federal Register Notice
    - Appendix C: Air Pollutant Emissions Calculations
    - Appendix D: Project Road Crossings
    - Appendix E: Summary of the PdV Wind Energy Project EIR
    - Appendix F: Management Indicator Species Report
    - Appendix G: Mitigation Monitoring Program ~~Biological Assessment~~
    - Appendix H: Draft EIR/EIS Comments and Responses ~~Biological Evaluation~~
    - Appendix I: Programmatic Agreement with State Historic Preservation Officer
    - Appendix J: Candidate Locations for Installation of Tubular Steel Poles as Mitigation
    - Appendix K: TRTP Noise Technical Report

In order to guide the reader to topics of interest in this EIR/EIS document, the following tables have been prepared to describe the location of specific subjects within the various sections of the EIR/EIS. For topics that are referred to throughout the document, Table 1-2 directs the reader to the primary discussions of these topics. In addition, Table 1-3 describes the location of topics that are specific to particular environmental resource/issue areas.

Table 1-2. Reader's Guide - General Topics

Topic	Location in Document
Proposed Project and Alternatives	• Sections 2.1 through 2.7~~6~~ describe in detail the Project components and routes for the ~~six~~seven alternatives that were analyzed within the EIR/EIS. • The Alternatives Screening Report (Appendix A) discusses the identification and screening process for 29 potential Project alternatives, including alternatives eliminated from detailed analysis. • An analysis of direct, indirect, and cumulative effects associated with each of the ~~six~~seven alternatives can be found in the respective issue area sections of Chapter 3 (see Sections 3.2 through 3.17). • Chapter 4 includes a comparison of the Project alternatives, as well as a discussion of the CEQA Environmentally Superior Alternative and the NEPA Lead Agency Preferred Alternative ~~(to be included in the Final EIR/EIS)~~.
Angeles National Forest (ANF)	• Section 2.2 provides a description of the Project components that are proposed within the boundaries of the ANF. • A discussion of the recreational resources within the ANF is included in Section 3.15 (Wilderness and Recreation). • Impacts to the visual quality of the ANF as a result of the Project are discussed in Section 3.14~~5~~ (Visual Resources). • Each of the other issue areas also describes the potential effects of the Project in the ANF (see Sections 3.2 through 3.17).
U.S. Army Corps of Engineers (USACE)	• Discussion of the USACE is presented throughout this Introduction (Chapter 1), largely with regard to USACE lands that would be traversed by the Project in the vicinity of Santa Fe Dam and Whittier Narrows (Segments 7 and 8).
California Public Utilities Commission (CPUC)	• The role of the CPUC as the CEQA Lead Agency for the TRTP is described in Sections 1.3 through 1.5.

Table 1-2. Reader's Guide - General Topics

Topic	Location in Document
Chino Hills State Park	• A description of the recreational resources and Project-related impacts associated with Chino Hills State Park is included in Section 3.15 (Wilderness and Recreation). • The Project's effect on the aesthetics of this park is discussed in Section 3.14 (Visual Resources).
Cumulative Effects	• The environmental impact analysis for each of the respective issue area sections (Sections 3.2 through 3.17) includes a discussion of reasonably foreseeable future projects and the cumulative effects associated with the TRTP.
Glossary of Terms and Acronyms	• Chapter 9 provides definitions for terms used throughout the document (Section 9.1: Glossary of Terms) as well as common acronyms (Section 9.2: Acronyms).
Long-Term Project Effects	• Section 5.1 (Long-Term Implications), describes the Project's irreversible and irretrievable commitment of resources, adverse environmental effects that cannot be avoided, and associated growth-inducing effects.
Mitigation Measures	• The environmental effects analysis for each of the respective issue area sections (Sections 3.2 through 3.17) includes mitigation measures that are recommended to reduce the significance of Project impacts. • The aforementioned sections also describe the Applicant-Proposed Measures that are considered part of the proposed Project. • A Mitigation Monitoring Program will be included in the Final EIR/EIS.
Pacific Crest National Scenic Trail (PCT)	• A discussion of Project effects on the recreational use of the PCT is included in Section 3.15 (Wilderness and Recreation). • Impacts to the scenic integrity of the PCT and potential for conflicts with the Angeles National Forest Land Management Plan are discussed in Section 3.145 (Visual Resources).
Permitting Agencies	• Section 1.4 (Agency Use of This Document) includes a list of anticipated federal, State, and local permits and approvals that are required for the Project.
Applicable Regulations and Policies	• Any regulation or policy that required further analysis is discussed in the respective issue area of Chapter 3 (see Sections 3.2 through 3.17). • The Project's compliance with applicable federal environmental regulations and policies is also discussed in Section 5.2.
Right-of-Way Expansion	• Sections 2.2 through 2.6 describe in detail the route components for the six Project alternatives, including the locations of expanded and new right-of-way (ROW). • An analysis of direct, indirect, and cumulative effects associated with the proposed new ROW or ROW expansion can be found in the respective issue area sections (see Sections 3.2 through 3.17).
Tehachapi Wind Resource Area (TWRA)	• A description of the Tehachapi Wind Resource Area and the role of the Project in the development of this area are included in Section 5.1 (Long-Term Implications) and Chapter 6 (Development of the Tehachapi Wind Resource Area).
Tower Types	• Section 2.2 describes the types (i.e., tubular steel pole versus lattice steel tower) and locations of the transmission towers that are proposed along the Project route. Figures 2.2-2 through 2.2-63 illustrate the types of transmission towers proposed along each segment of the Project. • A discussion of the aesthetic effects of these towers is included in Section 3.14 (Visual Resources).
USDA Forest Service	• The role of the USDA Forest Service as the NEPA Lead Agency for the Project is described in Sections 1.3 through 1.5.

In order to supplement the general topics guidance provided in Table 1-2, an additional table (Table 1-3) has been prepared to guide readers on topics specific to each environmental Issue Area addressed in the EIR/EIS. Many of the topics listed in Table 1-3 were identified as issues or concerns by the public during the public scoping process.

Table 1-3. Reader's Guide - Resource/Issue Area Topics

Topic	Location in Document
Air Quality	• Section 3.3 (Air Quality) describes existing environmental conditions and analyzes environmental impacts related to air quality. • A discussion of the Project's conformity with the Clean Air Act and other environmental regulations and policies that pertain to air quality can be found in Section 3.3.3 (Air Quality: Applicable Laws, Regulations, and Standards), as well as in Section 5.2 (Compliance with Applicable Federal Environmental Regulations and Policies).
Effects on Wildlife	• Section 3.4 (Biological Resources) describes the existing environmental conditions of the biological study area, and analyzes impacts associated with loss of habitat, federally and State protected species, and special-status species.
Construction Noise	• An analysis of the direct, indirect and cumulative effects of noise resulting from Project construction is included in Section 3.10 (Noise). • Section 3.10 also recommends mitigation measures to reduce potential construction-related noise impacts associated with the Project.
Corona Noise	• Section 3.10 (Noise) describes the existing audible corona noise calculated along the Project route, and discusses Project-related increases in corona noise from the operation and maintenance of proposed transmission lines and substations. • Section 3.4 (Biological Resources) addresses potential effects that Project-related corona noise would be expected to have on wildlife and biological resources.
Cumulative Impacts	• Cumulative environmental impacts of the proposed Project and alternatives are evaluated in each Issue Area section; please see Sections 3.2 through 3.17. • Cumulative impacts are those that would occur if impacts of the proposed Project or an alternative would combine with similar affects of other projects within the geographic scope of the analysis.
Electric and Magnetic Fields (EMF)	• EMF is discussed in Sections 3.17 and 5.3.1. Section 3.17 provides information related to electrical interference and shock hazards. • Section 5.3.1 provides an overview of current knowledge about potential health concerns associated with magnetic fields.
Electrical Interference	• Section 3.17 (Electrical Interference and Hazards) describes the Project's interference with communication, radio, and television and electronic equipment.
Endangered Species	• Endangered species as well as sensitive and listed plant and wildlife species are discussed in Section 3.4 (Biological Resources).
Environmental Justice	• Section 5.2 (Compliance with Applicable Federal Environmental Regulations and Policies) includes a discussion of whether and how the impacts of the TRTP disproportionately affect minority populations and low-income populations in compliance with Executive Order 12898.
Erosion	• Issues and concerns related to the potential for the proposed Project or an alternative to introduce erosion-related impacts are discussed in Section 3.7 (Geology, Soils, and Paleontology). • Section 3.8 (Hydrology and Water Quality) addresses water-quality related erosion issues, and Section 3.4 (Biological Resources) discusses erosion in terms of potential effects on natural habitat quality.
Farmland	• Section 3.2 (Agricultural Resources) provides analysis of farmland and agricultural lands in and near the Project Area.
Health Concerns	• The effects to public health associated with hazardous waste generated by Project construction, operation, and maintenance are discussed in Section 3.6 (Environmental Contamination and Hazards). • Section 3.17 (Electrical Interference and Hazards) describes the potential shock hazards and Project effects on cardiac pacemakers. • Section 5.3.1 provides an overview of current knowledge about potential health concerns associated with magnetic fields.
Land Uses	• Existing and proposed land uses (e.g., residences, schools, airports) that have been identified along the Project route are described in Section 3.9 (Land Use). • Recreational resources along the Project route are discussed in Section 3.15 (Wilderness and Recreation). • Impacts to farmland and agricultural operations are discussed in Section 3.2 (Agricultural Resources).
Local Economy	• Section 3.12 (Socioeconomics) addresses the existing conditions and expected effects on the local economy through discussions of Population and Housing, Local Business Revenue, and Public Revenue in the Project area.
Native American Sacred Sites	• Section 3.5 (Cultural Resources) includes a discussion of traditional cultural properties in the Project area, and describes the Project's consultation process with Native American Tribes.

Table 1-3. Reader's Guide - Resource/Issue Area Topics

Topic	Location in Document
Open Space and Wilderness Areas	• Section 3.15 (Wilderness and Recreation) provides itemized lists of the open space and designated Wilderness Areas along the Project route. • Section 3.15.2 (Affected Environment) provides descriptions of existing environment including open space and Wilderness Areas, and Sections 3.15.6 through 3.15.10 provides descriptions of how such resources would be affected by the proposed Project and alternatives.
Property Value	• Section 3.12 (Socioeconomics) includes a discussion of private property values and how they could potentially be affected by the Project or an alternative.
Public Recreation	• Public recreation opportunities and resources are discussed in Section 3.15 (Wilderness and Recreation), which provides itemized lists of recreational resources located along the Project route. • Section 3.15.2 (Affected Environment) provides descriptions of existing recreational resources and opportunities, and Sections 3.15.6 through 3.15.10 provide descriptions of how such resources and opportunities would be affected by the proposed Project and alternatives.
Public Safety	• Police services and healthcare facilities in the Project Area are discussed in Section 3.11 (Public Services and Utilities). • Potential health and safety issues related to environmental contamination are discussed in Section 3.6 (Environmental Contamination and Hazards). • Public safety issues related to wildfire risk are discussed in Section 3.16 (Wildfire Prevention and Suppression).
Quality of Life	• Section 3.12 (Socioeconomics) presents a discussion of Quality of Life, including factors that are considered to contribute to Quality of Life and how such factors could potentially be affected by the proposed Project or an alternative.
Seismic Hazards	• Section 3.7 (Geology, Soils, and Paleontology) describes the fault systems and seismicity of the Project area, and discusses Project impacts associated with seismic hazards.
Traffic	• Section 3.13 (Traffic and Transportation) lists the major roads and transportation services that would be crossed by the Project, and discusses increased congestion and other transportation concerns resulting from Project construction, operation, and maintenance. This section also discusses Project effects on public and private airports, air traffic, and military aviation.
Visual Resources	• Section 3.14 (Visual Resources) analyzes the visual quality impacts along the Project route. • Visual simulations of the proposed Project and alternatives at Key Observation Points (KOPs) are available in Maps and Figures Volume (under separate cover).
Streams and Rivers	• Section 3.8 (Hydrology and Water Quality) discusses the existing hydrological systems and resources in the Project Area, as well as the potential effects of the proposed Project or an alternative on these resources. • Section 3.4 (Biological Resources) addresses potential impacts to hydrological resources in terms of natural habitat quality.
Wildfire	• Section 3.16 (Wildfire Prevention and Suppression) describes the existing environmental conditions of the fire and fuels management study area, and analyzes Project impacts related to wildfire risk and management.

2. Description of Alternatives, including the Proposed Project

This Description of Alternatives chapter provides a detailed description of Southern California Edison's (SCE) Tehachapi Renewable Transmission Project (TRTP or proposed Project), which includes a series of new and upgraded high-voltage electric transmission lines (T/Ls) and substations to deliver electricity from new wind farms in Eastern Kern County, California, to the greater Los Angeles Basin, as well as alternatives to SCE's proposed Project.

To determine the alternatives that would be analyzed in detail in this EIR/EIS, an alternatives screening process was completed between October 2007 and June 2008. The results of this process have been documented in the Alternatives Screening Report provided in Appendix A. In total, the alternatives screening process resulted in the identification and screening of 29 potential alternatives. The alternatives considered included: (1) minor routing adjustments to SCE's proposed route; (2) entirely different T/L routes for some segments of the proposed alignment; and (3) alternate system voltages and system configurations. In addition to the 29 potential alternatives that were evaluated in the Alternatives Screening Report (Appendix A), other ideas for potential alternatives were suggested by agencies and the public during the scoping period for the EIR/EIS (August-October 2007). Many of these suggestions were conceptual and were not offered as specific alternatives, but rather as ideas to be explored. The alternatives considered, including the potential alternatives suggested by agencies and the public, as analyzed in the Alternatives Screening Report (Appendix A), and the reasons for being eliminated from further consideration are summarized below in Section 2.8.

Based on the alternatives screening process, three of the alternatives considered in the Alternatives Screening Report (Appendix A) were carried forward to be analyzed along with the No Project/Action Alternative (Alternative 1) and SCE's proposed Project (Alternative 2). These three alternatives are the West Lancaster Alternative (Alternative 3), Chino Hills Route Alternatives (Alternative 4, Routes A through D), and the Partial Underground Alternative (Alternative 5). Following completion of the Alternatives Screening Report, a new alternative was requested by the Forest Service to reduce ground disturbance within the ANF by minimizing new road construction through the use of helicopter construction, which resulted in the Maximum Helicopter Construction in the ANF Alternative (Alternative 6). ~~A final alternative, t~~The 66-kV Subtransmission Alternative (Alternative 7), was also developed following the completion of the Alternatives Screening Report in response to requests from the Board of Supervisors County of Los Angeles to reduce impacts to the River Commons or Duck Farm Project (located between Valley Boulevard – S7 MP 8.9 and S7 MP 9.9) and to provide habitat enhancement for least Bell's vireos within the Whittier Narrows Recreation Area as identified by SCE. Finally, in response to a comment letter on the Draft EIR/EIS submitted by the City of Chino Hills, an additional route modification was considered as part of Alternative 4, which is referenced herein as Alternative 4C Modified. These seven alternatives, including the five route options considered under Alternative 4, are discussed below in Sections 2.1 through 2.7.

The NEPA preferred alternative, as identified by the Forest Service, is a combination of Alternative 2 and Alternative 6, as discussed in Chapter 4 (Section 4.3.2). No new or greater impacts would be introduced as a result of this hybrid alternative, as it: (1) is based on two alternatives whose impacts have been fully analyzed in the EIR/EIS, and the change in impact magnitude would fall within the range identified for these two alternatives; and (2) would result only in a difference in the construction method utilized for removal and construction of the new transmission structures (ground-based construction versus helicopter construction).

The CEQA environmentally superior alternative, as identified by the CPUC, is also discussed in Chapter 4 (Section 4.3.1).

A regional location map depicting the proposed Project (Alternative 2) and other alternatives (Alternatives 3, 4, 5, 6 and 7) is provided in Figure 2.1-1 located at the end of this section. For detailed maps of these alternatives, please refer to Figures 2.2-1a through 2.2-1y (Alternative 2) located in the Map & Figure Series Volume, and Figure 2.3-1 (Alternative 3), Figures 2.4-1 through 2.4-4 (Alternative 4 A-D), Figure 2.5-1 (Alternative 5), Figure 2.6-1 (Alternative 6), and Figures 2.7-1 and 2.7-2 (Alternative 7) located at the end of Chapter 2.

The purpose of the proposed TRTP (summarized here as required per CEQA Guidelines §15124) is to provide the electrical facilities necessary to interconnect and integrate in excess of 700 megawatts (MW) and up to approximately 4,500 MW of new wind generation in the Tehachapi Wind Resource Area (TWRA) currently being planned or expected in the future, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard in an expedited manner (i.e., 20 percent renewable energy by year 2010 per California Senate Bill 107); to further address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley; and to address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin. For a full description of the Project objectives and for background information on the proposed Project, please see Section 1.2 (Purpose and Need).

A discussion of the intended use of this EIR/EIS, including the actions that would need to be taken by the Lead Agencies to approve the Project, is provided in Section 1.3 (Agency Use of this Document) (CEQA Guidelines §15124). Section 1.3 also lists the anticipated federal, State, and local permits and approvals that would be required for the Project, if approved. This EIR/EIS is intended to provide the environmental review for all of these actions as required pursuant to the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

Note to Readers: Please note that all mileage numbers provided in this EIR/EIS are based on the preliminary engineering completed by SCE as part of their Proponent's Environmental Assessment (PEA), and refined through the development of this document, and do not reflect mileage variations due to topography and other elements that affect transmission segment lengths. In addition, all estimates of construction equipment and workforce, land disturbance, construction waste, schedules, etc., are based on preliminary engineering data and, therefore, are subject to change based on final engineering.

This environmental document provides an assessment of potential environmental impacts associated with the proposed Project and Project alternatives. The potential impacts were determined based on the engineering design performed to date which in turn established the anticipated construction activities. In identifying these impacts it is recognized that for some elements of the Project, such as acres of land disturbance or miles of road upgrade, the impact cannot be represented as a definitive amount and therefore it was necessary to estimate a reasonable range of potential impact. In order to determine an appropriate range of impact, confidence intervals were derived in consultation with the professional engineers on Aspen's Team. The approach to determining confidence intervals aligns with the approach typically used to estimate project costs as is described below.

For project estimating, the highest confidence interval of ± 10 percent is achieved once final design and construction documents have been completed such that all the elements of construction are fully defined and only adjustments dictated by field conditions are expected. For projects where engineering is still in the preliminary stage and some elements of construction are expected to change as the design is perfected, a

confidence interval of ±20 percent is applied. For projects which are still at the conceptual or planning level and the location and elements of construction may be substantially adjusted, a confidence interval of ±30 percent is applied. Since the confidence intervals for estimating project costs also address fluctuations in financial parameters, which is not the case when applied to project components and associated impacts, it was therefore deemed reasonable to slightly narrow the bandwidth of the intervals. Therefore, for SCE's proposed Project, which has gone through preliminary engineering, the potential impacts are estimated with a confidence interval of ±15 percent. For those segments of the project alternatives that substantially differ from SCE's proposed Project, specifically Segment 8 of Alternative 4 (Chino Hills Routes A through D) and Alternative 5 (Partial Underground), the potential impacts are estimated with a confidence interval of ±20 percent to account for the uncertainty associated with a less developed design.

2.1 Alternative 1 - No Project/Action

Selection of the No Project/Action Alternative would mean that the Tehachapi Renewable Transmission Project, as proposed, would not be implemented. As such, none of the associated Project activities would occur and the environmental impacts associated specifically with the proposed Project would not occur. For example, SCE's existing Antelope-Vincent 220-kV line and the existing Antelope-Mesa 220-kV line would remain in place, as removal of these lines is specifically linked to construction of the proposed Project. As such, the environmental impacts associated with the Project, as described in Chapter 3 of this EIR/EIS, would not occur. The objectives for the Project would remain unfulfilled under the No Project/Action Alternative. For example, the electrical facilities necessary to reliably interconnect and integrate new wind generation in the Tehachapi Wind Resource Area (TWRA) that is currently being planned would not be constructed and therefore SCE and other California utilities may not be able to comply with California's Renewable Portfolio Standard on schedule (i.e., provision of 20 percent renewable energy by year 2010 per California Senate Bill 107).

In the absence of the Project, SCE still would continue to operate and maintain the existing transmission structures, access, and spur roads for operations and maintenance purposes under a variety of agreements (with landowners and land managers) and permits (Forest Service and US Army Corps of Engineers [USACE]). For example, within the ANF, approximately 80 miles of roads are currently being used to access the existing structures along Segments 6 and 11, which the use and maintenance of is authorized through existing roads permits issued by the Forest Service. SCE would also be required to interconnect and integrate power generation facilities into its electric system, as required under Sections 210 and 212 of the Federal Power Act (16 U.S.C. § 824 [i] and [k]) and Sections 3.2 and 5.7 of the CAISO's Tariff. At the time this analysis was conducted, two wind generation projects had submitted applications to Kern County (the PdV Wind Energy Project and the Alta-Oak Creek Mojave Project) and others are in the advanced planning stage according to the CAISO Interconnection Queue and are expected to submit applications in the future. Because of their location within SCE's service territory, these upcoming wind generation projects will need to interconnect to the SCE transmission system or find alternative means for transmitting their power to customers. These wind generation projects cannot be interconnected to the SCE transmission system without new transmission infrastructure north of Antelope Substation to the TWRA and an increase in transmission capacity south of Antelope Substation. Transmission of power from the Antelope Valley area is currently constrained by the existing Antelope-Mesa 220-kV transmission line, which would be overloaded by the addition of new wind generation resulting in system-wide power flow and reliability problems due to overloading of the existing system, such as curtailed generation, thermal overload, and blackouts. Therefore, without new transmission infrastructure (north of Antelope Substation) and upgrades to the existing system (south of Antelope

Substation), SCE would not be able to interconnect new renewable generation facilities and therefore would not meet Renewables Portfolio Standard requirements and the power needs of southern California.

Under the No Project/Action Alternative, the following events or actions (scenarios) related to the electricity generation and transmission are reasonably expected to occur in the foreseeable future:

- As currently conceived, some wind projects in the Antelope Valley and Tehachapi areas may require alternate means of transmitting their electricity~~would be postponed or cancelled~~, as SCE's capacity to transmit energy from the TWRA would be limited to the 700 MW already approved for the Antelope Transmission Project. Any such alternative transmission projects would have to meet ~~, or these proposed wind projects would have to find alternate means to connect to the existing transmission system without compromising~~ the same system reliability requirements.[1]
- The requirement of the Renewables Portfolio Standard (RPS), which requires retail sellers of electricity such as SCE and PG&E to increase their sale of electricity produced by renewable energy sources to 20 percent by 2010 (updated from 2017 to 2010 per the Energy Action Plan), may not be achieved as access to renewable energy from the Antelope Valley-Tehachapi region would either not be provided or would be delayed, and other sources of renewable energy would have to be developed.
- Other renewable energy resources would need to be identified and transmission studies would need to be conducted to connect these newly identified sources to the transmission grid, which would likely further limit achievement of the RPS goal by the 2010 deadline.
- The conceptual plan recommended by the Tehachapi Collaborative Study Group, as discussed in Section 1.2.1, would not be fully implemented. This plan is intended to collect power from Tehachapi area wind projects, interconnect facilities into the State's backbone grid, and upgrade the network to reliably deliver that power to load centers. The conceptual plan, which would allow for the transmission of over 4,000 MW of wind power, would be not be fully achieved because as SCE's capacity to transmit energy from the TWRA would be limited to the 700 MW already approved for the Antelope Transmission Project.
- Transmission providers such as SCE, PG&E, ~~or~~ LADWP, or Sagebrush would need to accommodate the power load by upgrading existing transmission infrastructure or building new transmission facilities along a different alignment and/or developers of wind generation facilities would need to build their own transmission facilities to connect to the transmission grid.
- The additional reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley would not be met and would have to be accommodated by other transmission upgrades to bring power into the area.
- The reliability issues of the existing Lugo-Mira Loma transmission lines within the Cajon Pass related to voltage collapse as a result of uncontrollable loss of load (in the event of wildfires or other natural disasters in the area) would persist.

As indicated above, under the No Project/Action Alternative, some currently unknown plan would need to be developed to provide the transmission upgrades necessary to interconnect renewable generation projects in the Tehachapi area and to also address the existing transmission problems south of Lugo Substation. Similarly, other yet unspecified transmission upgrades would presumably be proposed in the future to provide the needed capacity and additional reliability to serve growing electrical load in the Antelope Valley. To interconnect wind projects in the Tehachapi area, it is possible that other electrical utilities with transmission facilities in the area, such as LADWP, might purchase some of the power from Tehachapi wind developers and integrate it into their system. Another possibility is for the development of a private transmission line, similar to the existing Sagebrush line, which could connect wind projects to the electrical grid. However, at this time, the Lead

Agencies do not know what alternate transmission might be proposed in the future to accomplish the Project objectives if the Project is not implemented.

2.2 Alternative 2 – SCE's Proposed Project

2.2.1 Overview of Alternative 2

SCE's proposed Project would involve new and upgraded transmission infrastructure along approximately 173 miles of new and existing rights-of-way (ROW) from the TWRA in southern Kern County south through Los Angeles County and the Angeles National Forest (ANF) and east to the existing Mira Loma Substation in Ontario, San Bernardino County, California. The major components of SCE's proposed Project have been separated into eight distinct segments. Under separate application to the CPUC, SCE previously requested approval for Segments 1, 2, and 3 of the Antelope Transmission Project, which would also enhance transmission and related infrastructure serving the TWRA. Consequently, the description of major components for the TRTP begins with Segment 4. Segments 4 through 8, as well as Segments 10 and 11 of the TRTP are transmission facilities, while Segment 9 addresses the addition and upgrade of substation facilities. The segments begin numerically (not geographically) with Segment 4 (S4) and continue through Segment 11 (S11); however the discussion throughout this document has been presented geographically beginning with the northernmost point located in the TWRA (Segment 10) and ending at the southern/easternmost point in Ontario (Segment 8). Mileages along each segment are denoted first by the segment number (Sx, where x is between 4 and 11), followed by MP (for milepost) and then the mileage. A summary of the proposed TRTP's components, by segment, are provided in Table 2.2-1, below.

Table 2.2-1. Summary of Alternative 2 (SCE's Proposed Project) Components

Overall Project Construction
• Proposed construction duration of 5952 months (estimated to begin in ~~July~~December 2009 and end in October 2014) ~~November 2013)~~
• Transmission facility construction generally scheduled for Monday through Friday, 7:00 a.m. to 5:00 p.m.; however, if extended hours are necessary, such as 24-hour construction, a variance would be acquired
• Substation construction generally scheduled for Monday through Friday, 7:00 a.m. to 5:00 p.m.; however, if extended hours are necessary a variance would be acquired
• Workforce ranging in size from 10 to 300 persons, with daily average workforce of approximately 75 persons
• Disturbance during construction of approximately 1,612 ~~1,538~~ acres with a ±15% range of 1,370-1,854 ~~1,307-1,769~~ acres, resulting in permanent land disturbance of approximately 349 ~~277~~ acres with a ±15% range of 297-402 ~~235-318~~ acres
Segment 10: New Whirlwind – Windhub 500-kV T/L
• Initiates at the approved Windhub Substation (not part of Project) and ends at the new Whirlwind Substation
• Construct new approximately 16.8-mile single-circuit Whirlwind – Windhub 500-kV T/L
• All proposed permanent infrastructure to be located within new 330-foot-wide ROW (approx. 16.8 miles)
• Erect approximately 96 new single-circuit 500-kV lattice steel towers (LSTs) (90-200 ~~94-172~~ feet tall)
• Would require approximately 16 new wire setup sites for pulling/tensioner/splicing of conductor wire
Segment 4: Whirlwind 500/220 kV T/L Elements
• Initiates at the proposed Cottonwind Substation (not part of Project) and ends at the existing Antelope Substation
• Construct two new parallel 4.0-mile single-circuit 220-kV T/Ls (Cottonwind – Whirlwind 220-kV No. 1 & No. 2)
• Construct new approximately 15.6-mile single-circuit ~~Antelope~~Vincent – Whirlwind 500-kV T/L
• All proposed permanent infrastructure to be located within new 200-foot-wide ROW (approx. 19.6 miles total)
• Erect approximately 165 new transmission structures, including:
▪ 88 single-circuit 220-kV LSTs (73-138 ~~90-120~~ feet tall)

[1] The Antelope Transmission Project, which provides 700 MW of transmission capacity, is comprised of three segments: Segment 1 or the Antelope-Pardee 500-kV Transmission Project (SCH No. 2005061161) and the Antelope Transmission Project, Segments 2 & 3 (SCH No. 2006041160) were previously analyzed and approved by the CPUC and Forest Service (Segment 1 only).

Table 2.2-1. Summary of Alternative 2 (SCE's Proposed Project) Components

- 77 single-circuit 500-kV LSTs (113-188 feet tall)
- Would require approximately 28 wire setup sites for pulling/tensioner/splicing of conductor wire

Segment 5: Antelope – Vincent No. 2 500-kV T/L

- Initiates at the existing Antelope Substation and ends at the existing Vincent Substation
- Remove the existing Antelope – Vincent 220-kV T/L and the existing Antelope – Mesa 220-kV T/L
- Construct new approximately 17.4~~8~~-mile single-circuit Antelope – Vincent No. 2 500-kV T/L
- ~~All~~Most of the proposed permanent infrastructure (with the exception of side board width requirements of the new cutovers) to be located within existing ROW (approx. 17.4~~8~~ miles)
- Erect approximately 67 new single-circuit 500-kV LSTs (90-193 ~~113-188~~ feet tall)
- Would require approximately 37 wire setup sites for pulling/tensioner/splicing of conductor wire

Segment 11: New Mesa – Vincent (via Gould) 500/220-kV T/L

- Initiates at the existing Vincent Substation and ends at the existing Mesa Substation
- Remove approximately 4 miles of the existing Pardee – Vincent No. 1 220-kV T/L
- Remove approximately 15 miles of the existing Eagle Rock – Pardee 220-kV T/L
- Construct new approximately 18.7-mile 500-kV single-circuit T/L between Vincent and Gould Substations (initially energized at 220 kV)
- Re-route portions of two existing 220-kV lines into Vincent Substation using currently idle towers.
- String approximately 17.5 miles (approximately 3.3 miles are located on National Forest System [NFS] lands) of new 220-kV conductor on the vacant side of the existing double-circuit structures of the Eagle Rock-Mesa 220-kV T/L (10 ~~9~~ existing structures are located on NFS lands)
- Most of the proposed infrastructure would be located within existing ROW; however, the ROW may~~would~~ need to be expanded by up to approximately 250 feet to the west along the approximately 16~~3~~ miles north of Gould Substation ~~(on private lands)~~ to maintain safe clearances from the edge of the ROW due to wire swing of the new 500-kV T/L under wind loading conditions
- Erect approximately 76 total new transmission structures (59 LSTs on NFS lands), including:
  - 2 single-circuit 220-kV poles (120 feet tall)
  - 7 single-circuit 220-kV LSTs (120-160 feet tall)
  - 67 single-circuit 500-kV LSTs (100-198 feet tall), of which 17 are configured as delta towers (10 on NFS lands)
- Construction of 16 structures by helicopter (all on NFS lands), supported by 7 helicopter staging areas (4 on NFS lands)
- Would require approximately 36 wire setup sites for pulling/tensioner/splicing of conductor wire (11 on NFS lands)
- Approximately 40 miles (±15% range of 34 to 46 miles) of roads, of which approximately 33 miles (±15% range of 28 to 38 miles) would be on NFS lands, would be created (new), reconstructed, or require some amount of maintenance
- The majority of this segment would be located on NFS lands including: S11 MP 1.5-3.5, 3.75-18.5, 19.25-20.3, 20.8-21.3, 21.8-22.6, 23.05-24.15, and 24.35-24.55 (in-holdings or other non-NFS lands are located between the mileposts listed)

Segment 6: Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV) and Section of New Mira Loma – Vincent 500-kV T/L

- Initiates at the existing Vincent Substation and ends at the southern boundary of the ANF
- Remove approximately 5 miles of the existing Rio Hondo – Vincent No. 2 220-kV T/L between Vincent Substation and the "crossover" span (S6 MP 5.0)
- Construct new approximately 5-mile single-circuit Mira Loma – Vincent 500-kV T/L from the Vincent Substation to the "crossover" span (S6 MP 5.0)
- Remove approximately 26.9 miles of the existing Antelope – Mesa 220 kV T/L from Vincent Substation to the southern boundary of the ANF
- Construct new approximately 26.9-mile single-circuit Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV)
- Eliminate the existing crossing of the Rio Hondo – Vincent No. 2 220-kV T/L over the Antelope – Mesa 220-kV T/L
- All proposed permanent infrastructure to be located within existing ROW (approx. 27 miles)
- Erect approximately 138 total new transmission structures (105 on NFS lands – 99 LSTs and 6 tubular steel poles [TSPs]), including:
  - 2 single-circuit 220-kV LSTs (90-120 feet tall)
  - 26 single-circuit 500-kV TSPs (75-200 feet tall)
  - 106 single-circuit 500-kV LSTs (85-193 feet tall)
  - 4 three-pole dead-end 500-kV structures (75-80 feet tall) [all off NFS lands]
- Construction of 17 structures by helicopter (all on NFS lands), supported by 6 ~~5~~ helicopter staging areas (5 ~~4~~ on NFS lands)
- Would require approximately 19 wire setup sites for pulling/tensioner/splicing of conductor wire (16 on NFS lands – In addition, 5 alternate sites have been identified on NFS lands)
- Approximately 60~~1~~ miles (±15% range of 51~~2~~ to 69 ~~70~~ miles) of roads, of which approximately 57~~8~~ miles (±15% range of 49

Table 2.2-1. Summary of Alternative 2 (SCE's Proposed Project) Components

to 6~~7~~ miles) would be on NFS lands, would be created (new), reconstructed, or require some amount of maintenance
- The majority of this segment would be located on NFS lands including: S6 MP 1.45-1.7, 2.75-5.3, 5.65-6.7, 6.7-6.95, 7.05-24.8 (in-holdings or other non-NFS lands are located between the mileposts listed)

Segment 7: Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV) and Section of New Mira Loma – Vincent 500-kV T/L

- Initiates at the southern boundary of the ANF and ends at the existing Mesa Substation
- Remove approximately 15.8 miles of the existing Antelope – Mesa 220-kV T/L between the southern boundary of the ANF and the Mesa Substation
- Construct new approximately 15.8-mile 500-kV double-circuit T/L to include the Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV) and the new Mira Loma – Vincent 500-kV T/L
- Connect the new Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV) into the Rio Hondo Substation
- Relocate several existing 66-kV subtransmission lines between the existing Rio Hondo Substation and the existing Mesa Substation
- All proposed permanent infrastructure to be located within existing ROW (approx. 15.8 miles)
- Erect approximately 85 new transmission structures, including:
  - 1 double-circuit 220-kV LST (185 feet tall)
  - 2 double-circuit 500-kV TSPs (195-200 feet tall)
  - 3 single-circuit 500-kV LSTs (113-175 feet tall)
  - 79 double-circuit 500-kV LSTs (147-262 feet tall)
- Erect approximately 150 new double-circuit 66-kV subtransmission Light Weight Steel Poles (LWSPs) and TSPs
- Would require approximately 16 wire setup sites for pulling/tensioner/splicing of conductor wire

Segment 8: Section of New Mira Loma – Vincent 500-kV T/L

- Initiates near the existing Mesa Substation and ends at the existing Mira Loma Substation
- Remove various 220-kV T/L structures between the existing Mesa Substation and the existing Mira Loma Substation
- Construct approximately 33 miles of new double-circuit 500-kV T/L to include approximately 33 miles of the new Mira Loma – Vincent 500-kV T/L (Segments 8A/8C)
- Construct approximately 7 miles of new double-circuit 220-kV T/L from the Chino Substation to the Mira Loma Substation (Segment 8B)
- Relocate several existing 66-kV subtransmission lines in the area of the Mesa and Chino Substations
- Most of the proposed infrastructure would be located within existing ROW, except for the following:
  - Rose Hills Memorial Park ROW relocation (existing: 1.1-mile, 150 ~~200~~-foot-wide; future: 1.4-mile, 240-foot-wide)
  - Hacienda Heights ROW expansion (existing: 2.15-mile, 150 to 230-foot-wide; future: 250 to 330-foot-wide)
  - Fullerton Road new ROW (existing: none; future: 0.4-mile, 100-foot-wide)
  - Ontario (near Mira Loma Substation) ROW expansion (existing: 0.45-mile, 175-foot-wide; future: 325-foot-wide)
- Erect approximately 226 new transmission structures, including:
  - 2 single-circuit 220-kV LSTs (65-75 feet tall)
  - 57 double-circuit 220-kV LSTs (113-180 feet tall)
  - 3 single-circuit 500-kV LSTs (128-149 feet tall)
  - 92 double-circuit 500-kV LSTs (147-255 feet tall)
  - 2 single-circuit 220-kV TSPs (85-95 feet tall)
  - 11 double-circuit 220-kV TSPs (75-115 feet tall)
  - 5 three-pole dead-end 220-kV structures (75-110 feet tall)
  - 4 single-circuit 500-kV TSPs (120-170 feet tall)
  - 50 double-circuit 500-kV TSPs (150-195 feet tall)
- Erect approximately 55 new double-circuit 66-kV subtransmission LWSPs and 6 TSP riser poles
- Would require approximately 33 wire setup sites for pulling/tensioner/splicing of conductor wire

Segment 9: Substation Facilities

- Construct new Whirlwind Substation; activity would require acquisition of a new approximately 106-acre substation property
- Expand and upgrade existing Antelope and Vincent Substations to accommodate new 500-kV and 220-kV equipment; activity would require acquisition of additional substation property – approximately 20 ~~18~~ acres for Antelope upgrade and approximately 0.2 acre for Vincent upgrade; Vincent expansion would disturb approximately 20 ~~18~~ acres
- Upgrade existing Mesa and Gould Substations to accommodate new 220-kV equipment
- Upgrade existing Mira Loma Substation to accommodate new 500-kV equipment

Source: SCE, 2007a. Updated per GIS data submitted by SCE during EIR/EIS development.

Please note that the information provided herein is based on SCE's preliminary design for the TRTP and is subject to change during final engineering. For land disturbance numbers, a deviation factor of ±15 percent has been incorporated to provide a range allowing for the error associated with a project that has only gone through preliminary engineering. Furthermore, all mileages are approximate due to differences between engineering miles, which take into account topography, and map miles, which assume no variation in topography.

Sections 2.2.3 to 2.2.11 provide detailed descriptions of each component of SCE's proposed Project, including the proposed transmission facilities, substation facilities, and information technology facilities. Section 2.2.12 describes the construction elements of the proposed Project, including anticipated T/L and substation construction methods, construction schedule and workforce, estimates of land disturbance and waste generation.

2.2.2 Alternative 2 (SCE's Proposed Project) Description

Detailed information regarding the proposed routing of each transmission segment and the associated substation work are provided below in Sections 2.2.3 through 2.2.9. Detailed Project Location Maps are provided in Figures 2.2-1a through 2.2-1y (these figures are located in the Map & Figure Series Volume). Detailed cross-section diagrams demonstrating the existing and proposed conditions along the proposed alignment are also provided in Figures 2.2-2 through 2.2-63 (located at the end of Chapter 2). Please note that these diagrams represent general depictions of the conditions along the proposed alignment (i.e., not every change in conditions is shown) and are based on preliminary engineering. They also do not depict true project structure dimensions, as noted in the descriptions of each segment. Where TSPs are indicated in the cross-sections, LSTs would need to be used at turning points, in hilly terrain, and locations of dead-ends due to strength and construction requirements and limitations. In addition, Figures 2.2-64 through 2.2-82 provide diagrams of proposed transmission structures, new substations and upgrades to existing substations, and details of various construction activities (also located at the end of Chapter 2). Detailed information regarding Project construction is provided in tables located at the end of Chapter 2.

2.2.3 Segment 10: New Whirlwind – Windhub 500-kV T/L

Segment 10 would include an approximately 16.8-mile-long single-circuit 500-kV T/L that would enable the interconnection of potential wind generation from the Windhub[2] Substation to the Whirlwind Substation (see Figures 2.2-1b through 2.2-1e). The new 500-kV T/L would be built in a new 330-foot-wide ROW to be acquired by SCE.

2.2.3.1 Routing Details

S10 MP 0.0 (Windhub Substation) to S10 MP 16.8 (Whirlwind Substation)

As shown in Figure 2.2-1b, the new 500-kV T/L would exit the south side of the Windhub Substation within a new 330-foot-wide ROW and continue in generally a southwest alignment for approximately 3.4 miles. At this point, the alignment would turn south and continue in a southerly alignment until S10 MP 7.4. At S10 MP 7.4, the line would turn southwest and parallel the ~~north~~south side of Petroleum Road until S10 MP 15.8, which is the intersection of Rosamond Boulevard and North 170th Street West. As shown in Figures 2.2-1d and

2.2-1e, the line would then turn south for 0.9 mile to S10 MP 16.8, where it would enter the south-east side of the proposed new Whirlwind Substation.

2.2.3.2 Engineering Details

Structures

Segment 10 would utilize single-circuit 500-kV LST structures as shown in Figure 2.2-65. The proposed 16.8-mile Segment 10 alignment would require approximately 96 single-circuit 500-kV LSTs constructed of dulled galvanized lattice steel angle members connected by steel bolts.

Conductors

The proposed Segment 10 500-kV T/L would be strung with 2B-2156 kcmil ACSR with nonspecular finish. This type of conductor is a twin bundle with two 2156 aluminum conductor steel reinforced (ACSR) conductors, where each 2156 ACSR conductor has a diameter of 1.76 inches. Approximately 525,000 feet of conductor would be installed.

Insulators

The tangent and small angle 500-kV insulator assemblies would consist of two insulators in the form of a "V." Depending on the load, each leg of the "V" assembly would contain one or two one-piece gray polymer insulators. On the dead-end and large angle structures, the insulators would be arranged in a "barrel" configuration consisting of four polymer insulators.

Overhead Ground Wires

The location of the overhead ground wires would be on the peaks of the transmission structures. The structures would have two overhead ground wires. The diameter of the first overhead ground wire would be 11/16 inch and contain optical fibers for line protection and communications, while the other ground wire is steel and would be approximately 0.5 inch in diameter.

2.2.4 Segment 4: Whirlwind 220/500-kV T/Ls

Segment 4 consists of two new transmission line subsegments, each requiring a new 200-foot wide ROW to be acquired by SCE. The northern portion of Segment 4 would include approximately 4 miles of two new parallel 220-kV T/Ls between the Cottonwind Substation[3] and the proposed new Whirlwind Substation (i.e., Cottonwind – Whirlwind 220-kV T/Ls) (see Figures 2.2-1d through 2.2-1e). The southern portion of Segment 4 would connect the Whirlwind Substation to SCE's existing Vincent Substation near Acton ~~Antelope Substation in Lancaster with~~by installing a new, approximately 16-mile, 500-kV single-circuit T/L that would connect to the northern end of the previously approved Antelope – Vincent 500-kV T/L (Segment 2) completing the circuit to Vincent Substation (i.e., ~~Antelope~~Vincent – Whirlwind 500-kV T/L) (see Figures 2.2-1e through 2.2-1g).

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[2] The Windhub Substation was included as "Substation One" in SCE's proposed Antelope Transmission Project, Segments 2 & 3 application (A.04-12-008) (D.07-03-045) submitted to the California Public Utilities Commission for approval in December 2004. The application was amended in September 2005.

[3] The Cottonwind Substation is currently undergoing environmental review by the County of Kern in conjunction with a proposed wind farm development.

To match the overall system requirements, the existing Midway – Vincent No. 3 500-kV T/L, which the new ~~Antelope~~Vincent – Whirlwind 500-kV T/L would parallel, would be cut and routed (or terminated) into the Whirlwind Substation, as discussed in Section 2.2.10.1 (SCE, 2007b – DR#1: Q043), and Antelope Substation. To minimize the number of physical 500-kV crossings, the Midway – Vincent No. 3 500-kV T/L would be cutover to the previously approved Antelope – Tehachapi 500-kV T/L (Segment 3A).

2.2.4.1 Routing Details

S4 MP 0.0 (Cottonwind Substation) to S4 MP 19.6 (Antelope Substation)

Cottonwind – Whirlwind 220-kV T/Ls (S4 MP 0.0 to 4.0)

Beginning at the Cottonwind Substation (S4 MP 0.0), the proposed route generally follows a southeast alignment until S4 MP 4.0, where the 220-kV portion of Segment 4 would connect to the proposed Whirlwind Substation. From S4 MP 0.0 to 4.0, two new single-circuit 220-kV T/Ls would be installed within a new 200-foot wide ROW (see Figure 2.2-2) parallel and east of the existing Antelope – Magunden No. 1 and No. 2 220-kV T/Ls.

~~Antelope~~ Vincent – Whirlwind 500-kV T/L (S4 MP 4.0 to 19.6)

The new 500-kV structures would be installed generally paralleling the west side of the existing Midway – Vincent No. 3 500-kV T/L between the proposed new Whirlwind Substation and the existing Antelope Substation within a new 200-foot wide ROW. From the Whirlwind Substation (S4 MP 4.0), the new 500-kV T/L would follow a southeast alignment until approximately S4 MP 15.8 (see Figures 2.2-3 through 2.2-4), at which point the line would turn south paralleling the east side of 110th Street West within an entirely new 200-foot wide ROW for approximately 2.1 miles (see Figure 2.2-5). At approximately S4 MP 17.9, the alignment would turn east towards the Antelope Substation remaining along the south side of West Avenue J-8 for approximately 1.3 miles, and then turn north at approximately S4 MP 19.2 to connect to the northern end of the previously approved Antelope – Vincent 500-kV T/L (Antelope Transmission Project, Segment 2) just outside of Antelope Substation (S4 MP 19.6), which would complete the circuit to Vincent Substation. This would avoid unnecessary crossovers. The new Vincent – Whirlwind 500-kV T/L, however, would cross over the Los Angeles Department of Water and Power (LADWP) Sylmar – Celilo 1,000-kV DC T/L and the Owens Gorge – Rinaldi 230-kV T/L at approximately S4 MP 14.

2.2.4.2 Engineering Details

Structures

Cottonwind – Whirlwind 220-kV T/Ls (S4 MP 0.0 to 4.0)

Segment 4 would utilize single-circuit 220-kV LST structures as shown in Figure 2.2-64. There would be an estimated 88 single-circuit 220-kV LSTs used in this segment. The construction of these towers would be dulled galvanized lattice steel angle members connected by steel bolts. The height of the single-circuit 220-kV LSTs would range from 90 feet to 120 feet. (Note: These estimated heights are specific to Segment 4 and differ from the "typical" structure heights denoted in Figure 2.2-64.) The new T/L would be constructed as two circuits on two adjacent single-circuit structures.

~~Antelope~~Vincent – Whirlwind 500-kV T/L (S4 MP 4.0 to 19.6)

The Whirlwind - Antelope 500-kV T/L would use single-circuit 500-kV LST structures as shown in Figure 2.2-65. There would be an estimated 77 LSTs used in this segment. The construction of these towers would be dulled galvanized lattice steel angle members connected by steel bolts. The height of the single-circuit 500-kV LSTs would range from 113 feet to 188 feet. (Note: These estimated heights are specific to Segment 4 and differ from the "typical" structure heights denoted in Figure 2.2-65.)

Conductors

Cottonwind – Whirlwind 220-kV T/Ls (S4 MP 0.0 to 4.0)

The new 220-kV T/Ls would be strung with 2B-1590 kcmil ACSR with nonspecular finish. This type of conductor is a twin bundle with two 1590 ACSR conductors, where each 1590 ACSR conductor has a diameter of 1.50 to 1.55 inches. In this segment, approximately 300,000 feet of new conductor would be strung.

~~Antelope~~ Vincent – Whirlwind 500-kV T/L (S4 MP 4.0 to 19.6)

The proposed 500-kV T/L would be strung with 2B-2156 kcmil ACSR with nonspecular finish. In this segment, approximately 488,000 feet of conductor would be strung. This type of conductor is a twin bundle with two 2156 aluminum conductor steel reinforced (ACSR) conductors, where each 2156 ACSR conductor has a diameter of 1.76 inches.

Insulators

Cottonwind – Whirlwind 220-kV T/Ls (S4 MP 0.0 to 4.0)

The tangent 220-kV insulator assemblies have a single polymer insulator in a form of ~~an~~ I-string and V-string configurations. The angle and dead-end assemblies include two parallel polymer insulators.

~~Antelope~~Vincent – Whirlwind 500-kV T/L (S4 MP 4.0 to 19.6)

The tangent and angle 500-kV insulator assemblies would consist of two strings of insulators in the form of a "V". Depending on the load, each leg of the "V" assembly would contain one or two one-piece gray polymer insulators. On the dead-end structures, the insulators would be arranged in a "barrel" configuration consisting of four polymer insulators.

Overhead Ground Wires

Cottonwind – Whirlwind 220-kV T/Ls (S4 MP 0.0 to 4.0)

The location of the overhead ground wires would be on the peaks of the transmission structures. The 220-kV structures would have two overhead ground wires. One overhead ground wire would be approximately 11/16 inch in diameter and contain optical fibers for line protection and communications; the other ground wire would be approximately 0.5 inch in diameter.

~~Antelope~~Vincent – Whirlwind 500-kV T/L (S4 MP 4.0 to 19.6)

The location of the overhead ground wires would be located on the peaks of the transmission structures. The 500- kV structures would have two overhead ground wires. One overhead ground wire would be

approximately 11/16 inch in diameter and contain optical fibers for line protection and communications; the other ground wire would be approximately 0.5 in diameter.

2.2.5 Segment 5: Antelope – Vincent No. 2 500-kV T/L

Segment 5 consists of the construction of approximately ~~18~~ 17.4 miles of new single-circuit 500-kV T/L structures between SCE's existing Antelope Substation and Vincent Substations, located in Lancaster and near Acton, respectively (see Figures 2.2-1g through 2.2-1j). This new 500-kV T/L~~line~~ would be built next to a similar ~~an identical~~ existing 500-kV T/L and would replace two 220-kV T/Ls that would be removed. Construction would mostly occur within existing ROW.

2.2.5.1 Routing Details

S5 MP 0.0 (Antelope Substation) to S5 MP 17.4~~8~~ (Vincent Substation)

Beginning at the Antelope Substation 500-kV switchracks (S5 MP 0.0), the new Antelope – Vincent No. 2 500-kV T/L would head on a southeast alignment for approximately 16.6 miles, and then turn south for approximately 0.8~~1.2~~ miles to enter Vincent Substation (S5 MP 17.4~~8~~). The new 500-kV T/L would replace the existing Antelope – Vincent 220-kV T/L and the Antelope – Mesa 220-kV T/L from the existing Antelope Substation to a location just north of the existing Vincent Substation, at approximately S5 MP 16.9. At this point, the new Antelope – Vincent No. 2 500-kV T/L circuit would utilize two new single-circuit structures, an existing double-circuit structure that was already permitted as part of Segment 2, and one new pole located within the substation to connect to the 500-kV switchrack at Vincent Substation (S5 MP 17.4) (SCE, 2009d). The existing 220-kV structures supporting the Antelope-Vincent 220-kV T/L (including the last mile into the Vincent 220-kV switchrack) would be removed (SCE, 2009d). Once the existing 220-kV lines are removed, Segment 5 would mostly be built in the existing ROW (see Figures 2.2-6 through 2.2-9). The new Antelope – Vincent No. 2 500-kV T/L would generally follow the same route. ~~The new 500-kV T/L would use the remainder of the existing Antelope – Vincent 220-kV T/L that was not removed to complete the connection to the 500-kV switchracks at Vincent Substation (S5 MP 16.9 to 17.8)~~.

As shown in Figures 2.2-1g through 2.2-1j, the new Antelope – Vincent No. 2 500-kV T/L structures would mostly parallel the existing Midway – Vincent No. 3 500-kV T/L structures and future Antelope – Vincent No. 1 500-kV T/L structures. To minimize the number of physical 500-kV line crossings along the proposed route, the new T/L would be cutover to the existing Midway – Vincent No. 3 500-kV T/L and/or the future Antelope – Vincent No. 1 500-kV T/L (Segment 2) at approximately S5 MP 1.7, 9.8, 11.0, and 16.5. In these locations, the existing Midway – Vincent No. 3 500-kV structures would be reconfigured for the new Antelope – Vincent No. 2 500-kV T/L circuit and the new towers would hold the existing Midway – Vincent No. 3 500-kV T/L circuit. In effect, portions of the existing Midway – Vincent No. 3 500-kV T/L circuit would be transferred and electrically connected or "cutover" to the new 500-kV line, and vice-versa. As a result of these cutovers, the Midway – Vincent No. 3 500-kV T/L circuit and the new Antelope – Vincent No.2 500-kV T/L circuit would be separate electrical circuits comprised of both new and existing structures~~construction~~ (SCE, 2007b – DR#1: Q044).

The new T/L would cross over the Los Angeles Department of Water and Power (LADWP) Adelanto – Rinaldi 500-kV T/L and Rinaldi – Victorville 500-kV T/Ls at approximately S5 MP 15.8, as well as cross Highway 14 at approximately S5 MP 16.6 (see Figure 2.2-1j).

~~**Relocation of the Sagebrush Subtransmission Line.** As part of Segment 5, the existing Sagebrush subtransmission line would be re-routed around the 500-kV expansion area at the Antelope Substation (The Sagebrush line currently bisects this area). Beginning just south of West Avenue J, the Sagebrush line would be re-routed southeast for approximately 1,500 feet, paralleling the east side of the 500-kV expansion area, before turning southwest for approximately 1,500 feet, paralleling the south side of the 500-kV expansion area, to rejoin the existing alignment (SCE, 2008k).~~

2.2.5.2 Engineering Details

Structures

Segment 5 would utilize single-circuit 500-kV LST structures as shown in Figure 2.2-65. There would be an estimated 67 single-circuit 500-kV LSTs constructed of dulled galvanized lattice steel angle members connected by steel bolts. The height of the single-circuit 500-kV LSTs would range from 113 feet to 188 feet. (Note: These estimated heights are specific to Segment 5 and differ from the "typical" structure heights denoted in Figure 2.2-65.)

Conductors

The proposed Segment 5 500-kV T/L would be strung with 2B-2156 kcmil ACSR with nonspecular finish. Approximately 533,000 feet of conductor would be strung. The 220-kV connection to the Vincent Substation would be strung with approximately 32,000 feet of 2B-1590 kcmil ACSR with nonspecular finish. This type of conductor is a twin bundle with two 2156 aluminum conductor steel reinforced (ACSR) conductors, where each 2156 ACSR conductor has a diameter of 1.76 inches.

Insulators

The tangent and angle 500-kV insulator assemblies would consist of two strings of insulators in the form of a "V." Depending on the load, each leg of the "V" assembly would contain one or two one-piece gray polymer insulators. On the dead-end structures, the insulators would be arranged in a "barrel" configuration consisting of four polymer insulators.

Overhead Ground Wires

The location of the overhead ground wires would be on the peaks of the transmission structures. The 500-kV structures would have two overhead ground wires. One overhead ground wire would be approximately 11/16 inch in diameter and contain optical fibers for line protection and communications; the other ground wire would be approximately 0.5 inch in diameter.

2.2.6 Segment 11: Mesa – Vincent (via Gould) 500/220 kV T/L

Segment 11 would replace approximately 19 miles of existing single-circuit 220-kV T/L structures from Vincent Substation, located near Acton, to Gould Substation in La Cañada Flintridge with a new approximately 19-mile single-circuit 500-kV T/L, initially energized to 220-kV (see Figures 2.2-1j through 2.2-1n). SCE also proposes to install a second, approximately 18-mile 220-kV T/L circuit on the currently empty side of the existing double-circuit towers, which currently hold only the Eagle Rock-Mesa 220-kV T/L, beginning at the Gould Substation property in La Cañada Flintridge and ending at the Mesa Substation in Monterey Park (see Figures 2.2-1n through 2.2-1p and 2.2-1v). Construction of Segment 11 would generally be within existing ROW, except for some areas ~~of private land~~ north of Gould Substation (see Figures 2.2-1k

through 2.2-1n). In this area, the ROW width is currently irregular; therefore, SCE may~~would~~ need to expand~~ed~~ the ROW up to approximately 250 feet to the west of the existing corridor ~~(on private land)~~ to allow for a continuous width of 360 ~~320~~ feet to provide the required clearances to accommodate the "swing" of the proposed 500-kV T/L under wind loading conditions. Overall, the majority of this segment would be located on NFS lands within the ANF (approximately 20.4 miles) including: S11 MP 1.5-3.5, 3.75-18.5, 19.25-20.3, 20.8-21.3, 21.8-22.6, 23.05-24.15, and 24.35-24.55 (in-holdings or other non-Forest properties are located between the mileposts listed).

2.2.6.1 Routing Details

S11 MP 0.0 (Vincent Substation) to S11 MP 36.2 (Mesa Substation)

Vincent to Gould

Between the Vincent Substation and the Gould Substation, the existing LSTs currently supporting the Pardee – Vincent No. 1 220-kV T/L (approximately the first 4 miles) and the Eagle Rock – Pardee 220-kV T/L (approximately the last 15 miles) would be removed and replaced by the new Mesa – Vincent No. 2 500-kV T/L structures (see discussion below). The remaining portion of the existing Pardee – Vincent No. 1 220-kV T/L circuit would be routed over to an existing set of idle 220-kV towers (section of Pardee-Vincent No. 2) to maintain the circuit into the Vincent Substation. The remaining northern portion of the existing Eagle Rock – Pardee 220-kV T/L circuit, which currently travels in an east-west direction for approximately 20 miles, would be routed to a second set of idle 220-kV towers (3.6 mile section of what was once the Eagle Rock-Vincent 220-kV T/L) to maintain the circuit into Vincent Substation, thereby completing the new Pardee-Vincent No. 2 220-kV T/L circuit. The two sets of existing idle 220-kV tower lines discussed above currently head south from Vincent Substation to approximately S11 MP 3.6 and are shown in Figure 2.2-58. As noted above, the southern portion of the Eagle Rock – Pardee 220-kV T/L would be demolished and replaced with 500-kV towers to complete the 500-kV Mesa – Vincent No. 2 circuit. The remaining southern-most portion of the Eagle Rock – Pardee 220-kV T/L circuit, geographically between the Eagle Rock Substation and a point just outside of the Gould Substation, would be routed into the Gould Substation utilizing new structures thereby completing the new Eagle Rock – Gould 220-kV T/L circuit (SCE, 2007b – DR#1: Q068). These re-routes would each require approximately three new LSTs (SCE, 2007b – DR#1: Q066).

Once the existing Pardee – Vincent No. 1 and Eagle Rock – Pardee 220-kV T/L structures are removed, the new Mesa – Vincent No. 2~~1~~ 500-kV T/L (a.k.a. Gould – Vincent 500-kV T/L) would be built following the same route with towers in approximately the same locations. The new 500-kV T/L would exit Vincent Substation (S11 MP 0.0) and travel west for approximately 0.25 miles and then continue in a southerly direction to Gould Substation at S11 MP 18.7. For the first 0.9 miles, Segment 11 (to the west) would parallel Segment 6 (to the east) (see Figure 2.2-56). As noted above, a combination of existing Pardee – Vincent No. 1 220-kV LSTs and new 220-kV LSTs ~~as part of the Pardee – Vincent No. 1 220 kV T/L~~ would be utilized to provide for a connection to the Vincent Substation. From S11 MP 0.25 to 4.0 the new 500-kV T/L would proceed south-southwest, where the existing Pardee – Vincent No. 1 220-kV T/L structures would be replaced by the new Mesa – Vincent No. 2~~1~~ 500-kV T/L structures (see Figures 2.2-56 through 2.2-58). Segment 11 would continue in a south-southwest alignment from S11 MP 4.0 to MP 18.7 (Gould Substation), where the existing Eagle Rock – Pardee 220-kV T/L structures would be replaced by the new Mesa – Vincent No. 2~~1~~ 500-kV T/L structures (see Figure 2.2-59).

The new Mesa – Vincent No. 2 500-kV T/L would cross over/under several SCE 220-kV T/Ls and the LADWP Toluca – Victorville No. 1 500-kV T/L at S11 MP 2.5 (see Figure 2.2-1k), as well as Highway 2 at several places long the route (S11 MP 16.0, 17.7, and 18.4).

Following construction of Segment 11, the following T/L circuits would exist: Pardee – Vincent #1 (220 kV), Pardee – Vincent #2 (220 kV), Gould – Pardee (Not affected by TRTP), Mesa – Pardee (Not affected by TRTP), Mesa – Vincent #1 (220 kV), and Mesa – Vincent #2 (energized at 220 kV, although built at 500 kV between Vincent and Gould Substations) (SCE, 2009c).

Gould to Mesa

Approximately two new 220-kV poles would be installed on the north and east sides of the Gould Substation within the existing ROW (see Figure 2.2-60) to connect the new Mesa – Vincent No. 2 220-kV T/L circuit (a.k.a. Gould-Mesa 220-kV T/L) into the northern position (empty circuit location) of the existing double-circuit 220-kV LSTs currently supporting the Eagle Rock – Mesa 220-kV T/L. Once the new 220-kV T/L circuit exits the Gould Substation, it would continue east until approximately S11 MP 21.7 (~3 miles), then turn southeast until approximately S11 MP 24.9 (~3 miles), then south until approximately S11 MP 34.0 for (~9 miles), then south-southwest to approximately S11 MP 36.15 (~2 miles) before turning southeast into the Mesa Substation (S11 MP 36.2). From the Gould Substation south to the Mesa Substation (S11 MP 18.85 to 36.2), the new Mesa – Vincent No. 2 220-kV T/L circuit would be installed on the vacant position of the existing double-circuit 220-kV LSTs (see Figures 2.2-61 to 2.2-63). Outside of Goodrich Substation (S11 MP 27.4), one existing structure would be replaced to accommodate the routing of the new circuit south to the Mesa Substation.

2.2.6.2 Engineering Details

Structures

Segment 11 would utilize single-circuit 500-kV LST structures, as shown in Figure 2.2-65; single-circuit 500-kV delta tower structures, as shown in cross-section Figures 2.2-56 through 2.2-58; single-circuit 220-kV LST structures, as shown in Figure 2.2-64; and single-circuit 220-kV poles, as shown in Figure 2.2-74.

There would be an estimated 67 single-circuit 500-kV LSTs installed between Vincent Substation and Gould Substation. The construction of these towers would be dulled galvanized lattice steel angle members connected by steel bolts. The height of the single-circuit 500-kV LSTs would range from 100 feet to 220 feet. (Note: These estimated heights are specific to Segment 11 and differ from the "typical" structure heights denoted in the referenced figures.)

It is estimated that approximately seven single-circuit 220-kV LSTs would be installed as part of Segment 11, which would be constructed of dulled galvanized lattice steel angle members connected by steel bolts. The height of the single-circuit 220-kV LSTs would range from 120 feet to 160 feet. In addition, approximately two single-circuit 220-kV TSPs~~poles~~ would be required, which would be constructed out of dulled galvanized steel and would measure up to 120-feet tall. (Note: These estimated heights are specific to Segment 11 and differ from the "typical" structure heights denoted in the referenced figures.)

Conductors

The proposed Segment 11 500-kV T/L would be strung with 2B-2156 kcmil ACSR with nonspecular finish. Approximately 615,000 feet of 2156 kcmil ACSR would be strung. This type of conductor is a twin bundle

with two 2156 aluminum conductor steel reinforced (ACSR) conductors, where each 2156 ACSR conductor has a diameter of 1.76 inches. The proposed Segment 11 220-kV T/L would be strung with approximately 580,000 feet of 2B-1590 kcmil ACSR with nonspecular finish. This type of conductor is a twin bundle with two 1590 ACSR conductors, where each 1590 ACSR conductor has a diameter of 1.50 to 1.55 inches.

Within the ANF along Segment 11, in areas identified as high use flight corridors based on consultation with the Forest Service and the U.S. Fish and Wildlife Service, SCE would utilize markers to the extent feasible to make the conductors more visible to birds and reduce the potential for avian collisions. Markers may include, for example, bird flight diverters, commonly referred to as BFD, or swan flight diverters. These diverters are generally made of a small spiral device that wraps around the overhead shield wire. The feasibility of using such markers, which may include issues associated with icing and additional wind loading on the towers, would be determined by SCE as part of final engineering.

Insulators

The tangent and small angle 500-kV insulator assemblies would consist of two insulators in the form of a "V." Depending on the load, each leg of the "V" assembly would contain one or two one-piece gray polymer insulators. On the dead-end and large angle structures, the insulators would be arranged in a "barrel" configuration consisting of four polymer insulators.

The tangent 220-kV insulator assemblies have an I-string configuration single polymer insulator. The angle and dead-end assemblies include two parallel polymer insulators.

Overhead Ground Wires

The location of the overhead ground wires would be on the peaks of the transmission structures. The 500-kV structures would have two overhead ground wires. One overhead ground wire would be approximately 11/16 inch in diameter and contain optical fibers for line protection and communications; the other ground wire would be approximately 0.5 inch in diameter.

2.2.7 Segment 6: Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L and Section of New Mira Loma – Vincent 500-kV T/L

Segment 6 would consist of the construction of a total of approximately 32 miles of single-circuit 500-kV T/L structures in existing ROW from the Vincent Substation located near Acton to the southern boundary of the ANF (see Figures 2.2-1j through 2.2-1k and 2.2-1q through 2.2-1t). Approximately 27 miles of the existing Antelope – Mesa 220-kV T/L structures would be rebuilt with 500-kV single-circuit structures from the Vincent Substation to the southern boundary of the ANF initially energized at 220 kV. In addition, approximately 5 miles of the existing Rio Hondo – Vincent No. 2 220-kV T/L structures would be rebuilt with 500-kV single-circuit structures from the Vincent Substation to the existing "crossover" span (S6 MP 4.8). The existing crossing or "crossover" of the Rio Hondo – Vincent No. 2 220-kV T/L over the Antelope – Mesa 220-kV T/L would be eliminated. The completion of Segment 6 would result in two roughly parallel circuits constructed to 500-kV standards in the existing ROW from the Vincent Substation (S6 MP 0.0) to the southern boundary of the ANF (S6 MP 26.9). The easterly circuit would be the new Rio Hondo – Vincent No. 2 500-kV T/L initially energized at 220 kV (requires 26.9 miles of new 500-kV T/L). The westerly circuit would become a section of the new Mira Loma – Vincent 500-kV T/L (requires only approximately 5 miles of new 500-kV T/L, as the existing structures south of the "crossover span" to the southern boundary of the ANF are currently constructed to 500-kV standards with 500-kV structures). The majority of this segment

(approximately 21.85 miles) would be located on NFS lands within the ANF including: S6 MP 1.45-1.7, 2.75-5.3, 5.65-6.7, 6.7-6.95, 7.05-24.8 (in-holdings or other non-Forest properties are located between the mileposts listed).

2.2.7.1 Routing Details

S6 MP 0.0 (Vincent Substation) to S6 MP 26.9 (Southern Boundary of ANF)

No new ROW would be required for Segment 6. The existing ROW for the Rio Hondo – Vincent No. 2 220-kV T/L and the Antelope – Mesa 220-kV T/L would be used for the new circuits. Segment 6 would proceed in a southeasterly direction from the Vincent Substation (S6 MP 0.0) to the southern boundary of the ANF (S6 MP 26.9).

Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L

The new Rio Hondo – Vincent No. 2 500-kV T/L portion of Segment 6 (initially energized at 220 kV) would begin at the Vincent Substation (S6 MP 0.0) and would replace the existing Rio Hondo – Vincent No. 2 220-kV T/L up to the existing "crossover" span (S6 MP 4.8), and replace the existing Antelope – Mesa 220-kV T/L from the "crossover" span to the southern boundary of the ANF (S6 MP 26.9). From S6 MP 0.0 to 2.2, the existing Rio Hondo – Vincent No. 2 220-kV ~~T/L~~ LSTs would be replaced by the new Rio Hondo – Vincent No. 2 500-kV T/L on TSPs (see Figures 2.2-10 and 2.2-11). From S6 MP 2.2 to 2.45 the existing Rio Hondo – Vincent No. 2 220-kV ~~T/L~~ LSTs would be replaced by the new Rio Hondo – Vincent No. 2 500-kV T/L on three-pole dead-end structures to facilitate crossing other existing T/Ls in this area (see Figures 2.2-1k and 2.2-12). From approximately S6 MP 2.45 to 3.25 the existing Rio Hondo – Vincent No. 2 220-kV ~~T/L~~ LSTs would be replaced by the new Rio Hondo – Vincent No. 2 500-kV T/L on TSPs (see Figure 2.2-13), and from S6 MP 3.25 to 4.8 on LSTs (see Figure 2.2-14). At S6 MP 4.8, the existing Rio Hondo – Vincent No. 2 220-kV T/L currently crosses the existing Antelope – Mesa 220-kV T/L. This crossing would be eliminated, and the new Rio Hondo – Vincent No. 2 500-kV T/L would continue south in what is currently the Antelope – Mesa 220-kV alignment. From S6 MP 4.8 to 26.9, the existing Antelope – Mesa 220-kV LSTs would be replaced by the new Rio Hondo – Vincent No. 2 500-kV T/L on LSTs (see Figures 2.2-15 through 2.2-18).

To limit wind-driven conductor swing of the existing Rio Hondo – Vincent No. 1 220-kV T/L, which would be located adjacent to the new Rio Hondo – Vincent No. 2 500-kV T/L, SCE is proposing to intersect one single-circuit 220-kV LST to the existing Rio Hondo – Vincent No. 1 200-kV T/L north of S6 MP 1.0, and replace an existing 220-kV single-circuit suspension tower with one single-circuit 220-kV LST dead-end structure at S6 MP 4.0 (SCE, 2007b – DR#1: Q047). Using the dead-end structure would allow SCE to re-tension the spans to higher tension in order to reduce the sag and therefore reduce the wind-driven conductor swing.

Section of New Mira Loma – Vincent 500-kV T/L

The new Mira Loma – Vincent 500-kV T/L portion of Segment 6 would begin at the Vincent Substation (S6 MP 0.0) and would replace the existing Antelope – Mesa 220-kV T/L up to the existing "crossover" span (S6 MP 4.8). From S6 MP 0.0 to 2.2, the existing Antelope – Mesa 220-kV ~~T/L~~ LSTs would be replaced by the new Mira Loma – Vincent 500-kV T/L on TSPs (see Figures 2.2-10 and 2.2-11). From S6 MP 2.2 to 2.45 the existing Antelope – Mesa 220-kV ~~T/L~~ LSTs would be replaced by the new Mira Loma – Vincent 500-kV T/L on three-pole dead-end structures to facilitate crossing under other existing T/Ls in this area (see Figures 2.2-

1k and 2.2-12). From approximately S6 MP 2.45 to 3.25 the existing Antelope – Mesa 220-kV ~~T/L~~ LSTs would be replaced by the new Mira Loma – Vincent 500-kV T/L on TSPs (see Figure 2.2-13), and from S6 MP 3.25 to 4.8 on LSTs (see Figure 2.2-14). At S6 MP 4.8, the existing Antelope – Mesa 220-kV T/L currently crosses the existing Rio Hondo – Vincent No. 2 220-kV T/L. This crossing would be eliminated, and the new Mira Loma – Vincent 500-kV T/L would continue south in what is currently the Rio Hondo – Vincent 220-kV alignment to the southern boundary of the ANF. The existing Rio Hondo – Vincent No. 2 220-kV T/L, from the "crossover" span (S6 MP 4.8) to the southern boundary of the ANF, is currently constructed to 500-kV standards with 500-kV structures. Therefore, construction activities are not required to complete ~~for~~ the new Mira Loma – Vincent 500-kV T/L circuit from the "crossover" span to the southern boundary of the ANF (see Figures 2.2-15 and 2.2-18).

2.2.7.2 Engineering Details

Structures

Segment 6 would utilize single-circuit 500-kV LST structures, as shown in Figure 2.2-65; single-circuit 500-kV TSP structures, as shown in Figure 2.2-66; three-pole dead-end 500-kV structures; and single-circuit 220-kV LST structures, as shown in Figure 2.2-64.

Segment 6 would require an estimated 106 single-circuit 500-kV LSTs between Vincent Substation and the southern boundary of the ANF. The construction of these towers would be dulled galvanized lattice steel angle members connected by steel bolts. The height of the single-circuit 500-kV LSTs would range from 85 to 193 feet. Approximately two single-circuit 220-kV LSTs (for new Rio Hondo – Vincent No. 2 500-kV T/L) would ~~be~~ also be required, which would range in height from 90 to 120 feet. Approximately 26 single-circuit TSPs would be required (13 for new Rio Hondo – Vincent No. 2 500-kV T/L and 13 for new Mira Loma – Vincent 500-kV T/L), which would be constructed out of dulled galvanized steel and would range in height from 75 to 200 feet. In addition, Segment 6 would require approximately four 500-kV three-pole dead-end structures, which would range in height from 75 to 85 feet. (Note: These estimated heights are specific to Segment 6 and differ from the "typical" structure heights denoted in the referenced figures.)

Conductors

The two sections of T/L would be strung with 2B-2156 kcmil ACSR with nonspecular finish. Approximately 1,008,000 feet of conductor would be strung. This type of conductor is a twin bundle with two 2156 aluminum conductor steel reinforced (ACSR) conductors, where each 2156 ACSR conductor has a diameter of 1.76 inches.

Within the ANF along Segment 6, in areas identified as high use flight corridors based on consultation with the Forest Service and the U.S. Fish and Wildlife Service, SCE would utilize markers to the extent feasible to make the conductors more visible to birds and reduce the potential for avian collisions. Markers may include, for example, bird flight diverters, commonly referred to as BFD, or swan flight diverters. These diverters are generally made of a small spiral device that wraps around the overhead shield wire. The feasibility of using such markers, which may include issues associated with icing and additional wind loading on the towers, would be determined by SCE as part of final engineering.

Insulators

The tangent and angle 500-kV insulator assemblies would consist of two strings of insulators in the form of a "V." Depending on the load, each leg of the "V" assembly would contain one or two one-piece gray polymer

insulators. On the dead-end structures, the insulators would be arranged in a "barrel" configuration consisting of four polymer insulators.

Overhead Ground Wires

The location of the overhead ground wires would be on the peaks of the transmission structures. The 500-kV structures would have two overhead ground wires. One overhead ground wire would be approximately 11/16 inch in diameter and contain optical fibers for line protection and communications; the other ground wire would be approximately 0.5 inch in diameter.

2.2.8 Segment 7: Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L and Section of New Mira Loma – Vincent 500-kV T/L

Segment 7 would be a continuation of Segment 6 (see Section 2.2.7 above), where the existing Rio Hondo – Vincent No. 2 220-kV T/L on existing 500-kV structures (in the Rio Hondo – Vincent alignment) would be renamed the new Mira Loma – Vincent 500-kV T/L, and the existing Antelope – Mesa 220-kV T/L structures (in the Antelope – Mesa alignment) would be replaced by the new Rio Hondo – Vincent No. 2 500-kV T/L (initially energized to 220 kV) structures.

Segment 7 would consist of approximately 16 miles of single- and double-circuit 500-kV structures~~T/Ls~~ in the existing ROW from the southern boundary of the ANF, near the City of Duarte, south to SCE's existing Rio Hondo Substation in the City of Irwindale, and then continuing southwest across the San Gabriel Valley to SCE's existing Mesa Substation in the Monterey Park/Montebello area (see Figures 2.2-1t through 2.2-1v). Federal lands (USACE) crossed by Segment 7 include approximately 1.7 miles in the Santa Fe Dam area (see Figure 2.2-1u) and approximately 2.5 miles in the Whittier Narrows Recreation Area (see Figure 2.2-1v).

Segment 7 would result in two parallel T/L circuits between the southern boundary of the ANF and the existing Rio Hondo Substation, primarily on double-circuit structures, which would replace the existing Antelope – Mesa 220-kV T/L structures (in the Antelope – Mesa alignment), where the east circuit would be the final section of the new Rio Hondo – Vincent No. 2 500-kV T/L and the west circuit would be a section of the new Mira Loma – Vincent 500-kV T/L. The new Rio Hondo – Vincent No. 2 500-kV T/L (initially energized to 220-kV) would connect into the existing Rio Hondo Substation; however, the new Mira Loma – Vincent 500-kV T/L would not and would continue on towards the Mesa Substation (SCE, 2007b – DR#1: Q048).

From the Rio Hondo Substation (S7 MP 5.1) to the San Gabriel Junction (S7 MP 13.7), the existing Antelope – Mesa 220-kV structures would be replaced with double-circuit structures, where the new Mira Loma – Vincent 500-kV T/L would be located on these new double-circuit structures. The double-circuit structures would be strung with 500-kV conductor (2B-2156 kcmil ACSR) and would be utilized in a split-phase configuration[4] (SCE, 2007b – DR#1: Q052). At this point (San Gabriel Junction), the new Mira Loma – Vincent 500-kV T/L would leave the Antelope – Mesa 220-kV T/L alignment and crossover to the existing Chino – Mesa 220-kV T/L alignment. This crossover point would be the beginning of the Segment 8 (Subsegment 8A) section of the new Mira Loma – Vincent 500-kV T/L (refer to Section 2.2.9 below).

[4] Split-Phasing (Split-Phase Circuit) – Use of double-circuit construction to carry the load of a single circuit in order to phase the circuit for electric field cancellation. In other words, the load of a circuit which is normally carried on one A, one B, and one C phase is carried by 2A, 2B, and 2C phases. These phases are then arranged A-B-C from top to bottom on one side of the double-circuit tower and C-B-A top to bottom (or equivalent) on the other side in order to achieve field cancellation. Split-phasing has been utilized in Segments 7 and 8 of the Project as a measure to reduce EMF.

For the final portion of Segment 7, from the San Gabriel Junction (S7 MP 13.7) to just east of the Mesa Substation (S7 MP 15.8), the existing Antelope – Mesa 220-kV single-circuit LSTs would be removed and replaced with new double-circuit 500-kV LSTs, located approximately adjacent to the existing structures.

To accommodate the 500-kV construction along Segment 7, various lower-voltage subtransmission lines between the Rio Hondo Substation and Mesa Substation would be relocated mostly within the existing ROW.

2.2.8.1 Routing Details

S7 MP 0.0 (Southern boundary of ANF) to S7 MP 15.8 (Mesa Substation)

Section of New Replacement Rio Hondo – Vincent No. 2 500-kV T/L

The new Rio Hondo – Vincent No. 2 500-kV T/L portion of Segment 7 would begin at the southern boundary of the ANF and would generally proceed south-southwest to the Rio Hondo Substation (S7 MP 5.1). From the southern boundary of the ANF the new Rio Hondo – Vincent No. 2 500-kV T/L would follow the alignment of the existing Antelope – Mesa 220-kV T/L for one span (i.e., one structure), to a new single-circuit 500-kV LST. At this structure, the new Rio Hondo – Vincent No. 2 500-kV T/L would continue along the existing Antelope – Mesa 220-kV T/L alignment, to a new double-circuit 500-kV LST. From this point to S7 MP 1.2, the existing Antelope – Mesa 220-kV single-circuit LSTs would be replaced with double-circuit 500-kV LSTs, where the new Rio Hondo – Vincent No. 2 500-kV T/L would be on the east circuit (west circuit would be the new Mira Loma – Vincent 500-kV T/L, as described below) (see Figure 2.2-19). From S7 MP 1.2 to 1.7, the existing Antelope – Mesa 220-kV single-circuit LSTs would be replaced with double-circuit 500-kV TSPs (see Figure 2.2-20), and from S7 MP 1.7 to 5.1 (Rio Hondo Substation) with double-circuit LSTs (see Figures 2.2-21 and 2.2-22). From the southern boundary of the ANF (S7 MP 0.0) to the Rio Hondo Substation (S7 MP 5.1), the existing Rio Hondo – Vincent No. 2 220-kV T/L circuit would be removed from the existing 220-kV double-circuit LSTs, leaving the west circuit vacant (see Figures 2.2-19 through 2.2-22).

Section of New Mira Loma – Vincent 500-kV T/L

The new Mira Loma – Vincent 500-kV T/L portion of Segment 7 also would begin at the southern boundary of the ANF and would initially follow the alignment of the existing Rio Hondo – Vincent No. 2 220-kV T/L for the first two spans (i.e., approximately 1,800 feet or two structures) to an existing single-circuit 500-kV LST and then a new single-circuit 500-kV LST. At the next structure to the south (approximately S7 MP 1.5), the new Mira Loma – Vincent 500-kV T/L would join the new Rio Hondo – Vincent No. 2 500-kV T/L (initially energized at 220 kV) and proceed in a south-southwest direction in the existing Antelope – Mesa 220-kV T/L alignment. From this point to a point adjacent to the Rio Hondo Substation (S7 MP 5.1), the new Mira Loma – Vincent 500-kV T/L would be installed on new double-circuit LSTs and TSPs (see the discussion above under "New Rio Hondo – Vincent No. 2 500-kV T/L" for additional details) (see Figures 2.2-19 through 2.2-22). The new Mira Loma – Vincent 500-kV T/L would be installed as~~on~~ the west circuit, and the Rio Hondo – Vincent No. 2 500-kV T/L would be installed as~~on~~ the east circuit of these new double-circuit structures.

From a point adjacent to the Rio Hondo Substation (S7 MP 5.1) to the San Gabriel Junction (S7 MP 13.7), the new Mira Loma – Vincent 500-kV T/L would be installed in the existing Antelope – Mesa 220-kV T/L alignment, which would proceed south-southwest from the Rio Hondo Substation for approximately 5 miles and then turn west towards the Mesa Substation. From S7 MP 5.1 to 13.7 the existing Antelope – Mesa 220-kV single-circuit LSTs would be replaced with double-circuit 500-kV LSTs, where the new Mira Loma –

Vincent 500-kV T/L would be strung in a split-phase configuration (SCE, 2007b – DR#1: Q052) (see Figures 2.2-23a/b through 2.2-27).

At the San Gabriel Junction (S7 MP 13.7), the alignment of the Chino – Mesa 220-kV T/L, Center – Mesa 220-kV T/L, and Mesa – Walnut 220-kV T/L splits from the alignment of the Mesa – Rio Hondo 220-kV T/L, Laguna Bell – Rio Hondo 220-kV T/L, and Antelope – Mesa 220-kV T/L. To facilitate the crossing of T/Ls in this area the existing double-circuit 220-kV LSTs would be replaced with double-circuit three-pole dead-end structures (see Figure 2.2-27). At this point (S7 MP 13.7), the new Mira Loma – Vincent 500-kV T/L would leave the Antelope – Mesa 220-kV T/L alignment and connect into the existing Chino – Mesa 220-kV T/L alignment. This location would be the beginning of Segment 8 (Subsegment 8A).

From the San Gabriel Junction (S7 MP 13.7) to just outside of Mesa Substation (S7 MP 15.8), the existing Antelope – Mesa 220-kV single-circuit LSTs would continue to be replaced with double-circuit 500-kV LSTs. Two sets of 500-kV conductor would be installed on these structures (SCE, 2007b – DR#1: Q054) in a split-phased configuration to accommodate the new Mira Loma – Vincent 500-kV T/L (see Figure 2.2-28).

66-kV Subtransmission Relocation/Removal

As part of Segment 7, SCE proposes to relocate various 66-kV circuits along the Rio Hondo corridor west of the 605 freeway as well as along the Mesa corridor south of the 60 freeway. This relocation would vacate the current position of the 66-kV circuits, which is near the center of the ROW, and relocate them to the far west side along the 605 freeway and the far north side along the 60 freeway (SCE, 2008o). These moves are necessary to accommodate the proposed double-circuit 500-kV T/L. A total of approximately 45 existing double-circuit 66-kV subtransmission line LSTs would be relocated to the edge of the existing ROW or removed and placed underground. Additionally, 105 new 66-kV LWSP would be erected (SCE, 2007g).

Rio Hondo – Bradbury 66-kV line. The double-circuit 66-kV LSTs on the Rio Hondo – Bradbury 66-kV T/L, adjacent to the existing Antelope – Mesa 220-kV T/L alignment, would be removed (approximately 8,000 circuit feet) and relocated outside of the existing ROW (see Figure 2.2-22) beginning with the first structure north of Arrow Highway (S7 MP 4.4) to the angle structure just outside of the Rio Hondo Substation (S7 MP 5.1) (SCE, 2008o). Approximately 1,300 feet of federal lands (USACE) would be crossed (located just east of the 605 Freeway/north of Arrow Highway) as a result of this minor re-routing of the 66-kV line. The new Rio Hondo – Bradbury 66-kV line would proceed southeast across the 605 Freeway, where it may be necessary to underground the 66-kV T/L not only within the existing ROW to cross the new 500-kV T/L but also under the 605 freeway depending on clearance issues, to Arrow Highway and then continue east along the south side of Arrow Highway before turning southwest along the western bank of the San Gabriel River and proceeding to the south side of Rio Hondo Substation (SCE, 2007b – DR#1: Q055). Due to the number of other lines in the vicinity of Rio Hondo Substation, a short segment (approximately 400 feet) would be installed underground to bring the 66-kV line into the substation (SCE, 2008o). In general, the existing 66-kV H-frame wood poles, which can accommodate up to 4 circuits but are currently only occupied by three circuits (one empty circuit), would be utilized along the proposed 66-kV re-route. The exception would be the addition of new steel poles at turns/corners (2 total) and risers for underground transitions (4 total); however, if it is determined that the existing 66-kV H-frame wood poles are deteriorated or cannot handle the new calculated wind loads associated with the addition of the new 66-kV line, then they would be removed and replaced. New ROW would be required to allow for the crossing of the 605 Freeway between the existing 220-kV ROW and Arrow Highway.

Rio Hondo – Amador and Rio Hondo – Anita No. 2 66-kV lines. Approximately 17,500 circuit feet of the existing Rio Hondo – Amador 66-kV line and approximately 2,500 circuit feet of the existing Rio Hondo – Anita No. 2 66-kV line would be relocated to provide the additional room necessary within the existing ROW to accommodate the new double-circuit 500-kV T/L (SCE, 2008o). Upon exiting the south side of Rio Hondo Substation, these 66-kV lines would proceed southwest approximately 1,100 feet towards the San Gabriel River. At the west/north bank of the San Gabriel River, the 66-kV lines would be converted to underground and proceed southwest along the riverbank approximately 900 feet, crossing under the 605 Freeway, and entering into the existing 220-kV ROW and continuing along the west side in an underground configuration for approximately 400 feet. The Rio Hondo – Amador and Rio Hondo – Anita No. 2 66-kV lines would be converted back overhead and be re-located on the far west side within the existing 220-kV ROW for approximately 640 feet. A distribution circuit which presently parallels this 66-kV circuit would also need to be relocated.

The Rio Hondo – Amador and Rio Hondo – Anita No. 2 66-kV lines would rise in overhead configuration outside ~~then leave~~ the existing 220-kV ROW (see Figure 2.2-23a) and proceed southwest in the existing 66-kV ROW along the west side of the San Gabriel River ~~Rivergrade Road, then southwest~~ and west along the north side of Lower Azusa Road, and then south along the west side of Peck Road until they connect to their present position on Ramona Boulevard. Within this existing 66-kV ROW, the existing poles would be utilized unless they are determined to be deteriorated or cannot handle the new calculated wind loads associated with the addition of the new 66-kV line.

Rio Hondo – Amador – Jose – Mesa 66-kV line. Approximately 52,500 circuit feet of the Rio Hondo – Amador – Jose – Mesa 66-kV line would be relocated beginning at the south side of the Rio Hondo Substation. Upon exiting the south side of Rio Hondo Substation, the Rio Hondo – Amador – Jose - Mesa 66-kV line relocates to a vacant position with the existing Rio Hondo – Lark Ellen – Package – Walnut 66-kV line (SCE, 2008o). The two circuits would proceed across the San Gabriel River to south/east side of Rivergrade Road. The Rio Hondo – Amador – Jose - Mesa 66-kV line would continue south along Rivergrade Road to Lower Azusa Road, where the existing wood poles would be replaced one-for-one with LWSPs, which would be approximately 10-feet taller and of slightly larger diameter than the existing wood poles, then proceed south paralleling the 605 Freeway to Ramona Boulevard, at which point the line would turn west on Ramona Boulevard crossing over the 605 Freeway to tie into the existing 220-kV ROW, where the 66-kV line would continue south along the western edge of the 220-kV ROW (see Figures 2.2-23a). South of Ramona Boulevard (approximately S7 MP 7.5), the 66-kV line would be relocated from the west side of the 220-kV ROW (within the existing ROW) to the east side for approximately 7,000 feet, up to the north side of Valley Boulevard (S7 MP 8.9). At this point, the 66-kV line would be relocated again to the western edge of the 220-kV ROW ~~for approximately 2.5 miles~~ to approximately Structure #48 (see Figures 2.2-23b and 2.2-24). At this point, the 66-kV line would turn south, leaving the existing 220-kV ROW (see Figure 2.2-26a). ~~Within the existing ROW, the existing wood poles would be replaced one for one with LWSPs, which would be approximately 10 feet taller and of slightly larger diameter than the existing wood poles.~~ The Rio Hondo – Amador – Jose – Mesa 66-kV line would re-enter the existing 220-kV ROW north of the Pomona Freeway near Structure #52 and continue west to Mesa Substation, where the 66-kV structures would be removed and replaced with LWSPs along the western edge of the 220-kV ROW (see Figure 2.2-26b through 2.2-28). To accommodate the 66-kV structures within the existing 220-kV ROW through the Whittier Narrows Recreation Area along with the new double-circuit 500-kV T/L, SCE proposes the installation of shorter structures with shorter spans to provide the clearances required for conductor sway for the new double-circuit 500-kV structures. As such,

the 66-kV structures would not be installed one-for-one with the 500-kV structures, but instead at a ratio of closer to two to one.

Mesa – Rush No. 2, Mesa – Anita – Eaton, and Mesa – Narrows 66-kV lines. Approximately three 6,000~~11,000~~-foot circuits (each) of overhead 66-kV line would be relocated (SCE, 2008o). At San Gabriel Boulevard, the existing 66-kV circuits would join up with the Rio Hondo – Amador – Jose – Mesa 66-kV line and the four circuits would be relocated to the north side of the 220-kV ROW for approximately 4,000~~9,000~~ feet, at which point the Mesa – Ravendale – Rush 66-kV line would parallel the four circuits in a multi-circuit structure configuration along the north side of the 220-kV ROW up to approximately 2,000 feet east of Mesa Substation (see Figures 2.2-27 and 2.2-28).

Mesa – Ravendale – Rush 66-kV line. Approximately 2,000 circuit feet of overhead 66-kV line would be relocated to parallel the Mesa – Rush No. 2, Mesa – Anita – Eaton, Mesa – Narrows, and Rio Hondo – Amador – Jose – Mesa 66-kV lines (see Figure 2.2-28) beginning at approximately S7 MP 15.45 (see above description) (SCE, 2008o). The five circuits in a multi-circuit structure configuration would tie into their existing rack positions at Mesa Substation along the north side of the 220-kV ROW.

2.2.8.2 Engineering Details

Structures

Segment 7 would utilize single-circuit 500-kV LST structures, as shown in Figure 2.2-65; single-circuit 500-kV TSP structures, as shown in Figure 2.2-66; double-circuit 500-kV TSP structures, as shown in Figure 2.2-67; double-circuit 500-kV LST structures, as shown in Figure 2.2-68; double-circuit 220-kV LST structures, as shown in Figure 2.2-69; double-circuit 66-kV TSP structures, as shown in Figure 2.2-70; and double-circuit 66-kV LWSP structures, as shown in Figure 2.2-72.

Segment 7 would require an estimated 83 LSTs consisting of one double-circuit 220-kV LST, three single-circuit 500-kV LSTs, and 79 double-circuit 500-kV LSTs constructed of dulled galvanized lattice steel angle members connected by steel bolts. The heights of the double-circuit 220-kV LSTs, single-circuit 500-kV LSTs, and double-circuit 500-kV LSTs would be 185 feet, 113 to 175 feet, and 147 to 262 feet, respectively. It is also estimated that Segment 7 would require two double-circuit 500-kV TSPs constructed out of dulled galvanized steel ranging in height from 195 feet to 200 feet. (Note: These estimated heights are specific to Segment 7 and differ from the "typical" structure heights denoted in the referenced figures.)

In addition, the replacement of portions of SCE's existing 66-kV subtransmission system would result in the removal of approximately 45 double-circuit 66-kV LSTs and replacement with approximately 150 double-circuit 66-kV LWSPs and TSPs.

Conductors

In Segment 7, the two sections (or circuits) of the proposed 500-kV T/L would be strung with approximately 84,500 feet per circuit of 2B-2156 kcmil ACSR with nonspecular finish. The total length of conductor that would be strung would be approximately 1,014,000 feet. This type of conductor is a twin bundle with two 2156 aluminum conductor steel reinforced (ACSR) conductors, where each 2156 ACSR conductor has a diameter of 1.76 inches.

Insulators

The tangent and angle 500-kV insulator assemblies would consist of two strings of insulators in the form of a "V." Depending on the load, each leg of the "V" assembly would contain one or two one-piece gray polymer insulators. On the dead-end structures, the insulators would be arranged in a "barrel" configuration consisting of four polymer insulators.

Overhead Ground Wires

The location of the overhead ground wires would be on the peaks of the transmission structures. The 500-kV structures would have two overhead ground wires. One overhead ground wire would be approximately 11/16 inch in diameter and contain optical fibers for line protection and communications; the other ground wire would be approximately 0.5 inch in diameter.

2.2.9 Segment 8: Section of New Mira Loma – Vincent 500-kV T/L

Segment 8, which has been divided into three subsegments (8A, 8B and 8C), consists of approximately 33 miles of single-circuit and double-circuit 500-kV T/L structures beginning just at the San Gabriel Junction (S8A MP 2.2) and ending at the Mira Loma Substation in Ontario (see Figures 2.2-1v through 2.2-1y). Existing ROW would be used for the majority of Segment 8, except where approximately three miles of new ROW would be required to accommodate new construction (details provided below in Section 2.2.9.1). Also as part of Segment 8, various subtransmission and distribution lines near Mesa Substation and Chino Substation would be relocated within the existing ROW. Federal lands (USACE) crossed by Segment 8 include approximately 2.14 miles in the Whittier Narrows Recreation Area (see Figure 2.2-1v).

As a general overview, Subsegments 8A, 8B, and 8C would consist of the following:

Subsegment 8A

- Rebuild the existing Chino – Mesa 220-kV T/L (not currently energized) ~~with~~ on 500-kV double-circuit structures just east of the Mesa Substation to a point approximately 0.5 mile west of the Chino Substation (S8A MP 28.0) (See subtransmission line discussion below for the portion of the route from 0.5 mile west of Chino Substation into Chino Substation). From the Chino Substation at S8A MP 28.4 to a point approximately 0.75 mile west of the Mira Loma Substation at S8A MP 34.0, the existing Chino – Mira Loma No. 2 220-kV T/L and Chino – Mira Loma No. 3 220-kV T/L structures would be removed and replaced with 500-kV double-circuit structures. The new double-circuit would be energized as the Mira Loma – Vincent 500-kV T/L in a split-phased configuration. From this point (S8A MP 34.0), 500-kV single-circuit structures would be built parallel to the existing Chino – Mira Loma No. 1 220-kV T/L structures and the existing Lugo – Serrano 500-kV T/L structures into the Mira Loma Substation at S8A MP 35.2.
- The following subtransmission lines would be rearranged to accommodate the proposed 500-kV circuit:
    - Nine 66-kV LSTs would be removed and replaced with approximately 41 LWSPs, beginning at the San Gabriel Junction (S8A MP 2.2) and continuing for approximately 2.1~~1.5~~ miles along the south side of the existing ROW.
    - Beginning 0.5 miles west of Chino Substation (S8A MP 28.0), three spans of the existing Chino – Soquel 66-kV T/L (currently placed on 220-kV structures) would be rebuilt on 500-kV double-circuit structures to the Chino Substation.
    - Multiple 66-kV lines in the vicinity of the Chino Substation beginning approximately 500 feet west of Central Avenue (S8A MP 27.7) to Magnolia Avenue (S8A MP 28.7) would be placed underground to make room for the new 500-kV double-circuit structures.

Subsegment 8B

- Rebuild the Chino – Mira Loma No. 1 220-kV T/L structures from the Chino Substation (S8B MP 0.0) to the Mira Loma Substation (S8B MP 6.8) with 220-kV double-circuit structures to accommodate the Chino – Mira Loma No. 1 220-kV and Chino – Mira Loma No. 2 220-kV T/Ls.

Subsegment 8C

- The new Chino – Mira Loma No. 3 220-kV T/L would occupy the south circuit on the new double-circuit 500-kV LSTs (installed as described in Subsegment 8A) from the Chino Substation (S8C MP 0.0) to approximately 0.8 miles west of the Mira Loma Substation (S8C MP 6.4). The northern circuit would be the new Mira Loma – Vincent 500-kV T/L as described above for Subsegment 8A. The new Chino – Mira Loma No. 3 220-kV T/L would utilize existing 220-kV double-circuit towers to connect into Mira Loma Substation.

The completed Segment 8 from just east of the Mesa Substation to the Chino Substation would result in 500-kV double-circuit structures, primarily on existing ROW, with conductors operated in a split-phased configuration to accommodate the new Mira Loma – Vincent 500-kV T/L. From the Chino Substation to the Mira Loma Substation, there would be approximately 5 miles of 500-kV double-circuit structures, and approximately 1.2 miles of 500-kV single-circuit structures, primarily on existing ROW. On the double-circuit section, the north circuit would be the new Mira Loma – Vincent 500-kV T/L and the south circuit would be the new Chino – Mira Loma No. 3 220-kV T/L. The single-circuit section would accommodate the new Mira Loma – Vincent 500-kV T/L. In addition, between the Chino Substation and the Mira Loma Substation there would be approximately 7 miles of 220-kV double-circuit structures, primarily on existing ROW, accommodating the new Chino – Mira Loma No. 1 220-kV and Chino – Mira Loma No. 2 220-kV T/Ls.

To reduce conductor swing that may occur between the existing 220-kV T/Ls and the new Mira Loma – Vincent 500-kV T/L, additional 220-kV structures would be added. These additional structures would reduce the span length between structures, which would reduce the conductor slack and thereby limit the range of motion for a given span. The new 220-kV structures would be added in various areas throughout Segment 8, including near S8A MP 2.2 (San Gabriel Junction), 4.2 (San Gabriel River Freeway crossing), 8.2 (near existing structure No. 30), 13.5 (Fullerton Road/Pathfinder Road), and 19.2 (turn tower) (SCE 2007e, DR#3 Q3-1).

2.2.9.1 Routing Details

S8 MP 0.0 (Mesa Substation) to S8 MP 35.2 (Mira Loma Substation)

Subsegment 8A: Mira Loma – Vincent 500-kV T/L and Subsegment 8C: New Chino – Mira Loma No. 3 220-kV T/L

At the San Gabriel Junction (S8A MP 2.2), the existing double-circuit 220-kV LSTs of the existing Laguna Bell – Rio Hondo 220-kV T/L and Mesa – Rio Hondo 220-kV T/L, and the 220-kV LSTs of the existing Mesa – Walnut 220-kV T/L and Center – Mesa 220-kV T/L, would be removed and replaced with one shorter, 220-kV double-circuit three-pole steel dead-end structure (see Figure 2.2-71) to facilitate crossing underneath the new Mira Loma – Vincent 500-kV T/L. The 66-kV span located west of these existing 220-kV double-circuit LSTs (at approximately S8A MP 4.4) would be installed underground for approximately 300 feet to allow for this reconfiguration.

From the San Gabriel Junction (S8A MP 2.2) to S8A MP 4.2, the existing Chino – Mesa 220-kV single-circuit LSTs (not currently energized) would be replaced with 500-kV double-circuit LSTs in a split-phased

configuration to accommodate the new Mira Loma – Vincent 500-kV T/L (see Figures 2.2-29). In addition, for the first span east of the San Gabriel Junction, as well as between S8A MP 4.2 to 4.4 the two existing 220-kV single-circuit LSTs to the north would be replaced with one taller, 220-kV double-circuit LST to maintain clearances to the new adjacent 500-kV double-circuit LSTs (see Figure 2.2-30). On the west side of the San Gabriel River Freeway (I-605) at S8A MP 3.3, the LADWP double-circuit Victorville – Century No. 1 and No. 2 287-kV T/Ls would be crossed by the Mesa – Walnut 220-kV T/L, Center – Walnut 220-kV T/L, and the new Mira Loma – Vincent 500-kV T/L. The details of how this would be accomplished would be determined during final engineering. ~~also be reconfigured and lowered by removing one existing LST and installing two 220 kV three pole steel dead end structures. In this same area (west side of the I 605), the two single circuit LSTs of the Mesa – Walnut 220 kV T/L and Center – Mesa 220 kV T/L would also be replaced with one taller, double circuit 220 kV LST to facilitate the reconfiguration of the LADWP 287 kV lines.~~

Continuing in a southeasterly direction from S8A MP 4.4 to 5.85, the existing Chino – Mesa 220-kV single-circuit LSTs would continue to be replaced with 500-kV double-circuit LSTs (see Figures 2.2-31). At approximately S8A 4.7, the second span east of Workman Mill Road, one additional double-circuit LST would be installed in the Mesa – Walnut 220-kV T/L and Center – Olinda 220-kV T/L to maintain clearances to the new adjacent 500-kV T/L. From S8A MP 5.85 to 8.1, the alignment would continue southeast through the Rose Hills Memorial Park, and then turns south (see Figure 2.2-32). For the portion of the alignment through Rose Hills Memorial Park (S8A MP 5.85 to 7.2), the existing double-circuit Mesa – Walnut 220-kV T/L and Center – Olinda 220-kV T/L which currently traverse Rose Hills Memorial Park would be rerouted, along with the new Mira Loma – Vincent 500-kV T/L, to the north-eastern boundary of the Rose Hills Memorial Park property (see Figure 2.2-1v). As part of this reroute, five existing double-circuit LSTs which currently hold the Mesa – Walnut 220-kV T/L and Mesa – Olinda 220-kV T/L would be removed and eight new 220-kV double-circuit LSTs would be installed. A new approximately 1.4-mile, 240-foot-wide ROW, which would accommodate both the 220-kV double-circuit and 500-kV double-circuit structures, would be acquired from Rose Hills Memorial Park and the existing approximately one-mile, 150 ~~200~~-foot-wide ROW, which currently crosses Rose Hills Memorial Park, would be abandoned.

From S8A MP 8.1 to 9.0, the alignment would continue in a southeasterly direction, where the existing Chino – Mesa 220-kV single-circuit LSTs would be replaced with 500-kV double-circuit LSTs (see Figure 2.2-33). From S8A MP 9.0 to 9.5, the existing Chino – Mesa 220-kV single-circuit LSTs would be replaced with 500-kV double-circuit TSPs (see Figure 2.1-34). From S8A MP 9.5 to 11.2 the alignment would turn east, and the new 500-kV double-circuit TSPs would be placed south of the existing 220-kV double-circuit LSTs (see Figure 2.2-35). To accommodate the new 500-kV double-circuit LSTs from S8A MP 11.2 to 13.3 through Hacienda Heights, the ROW would need to be expanded by 100 feet (from 230 feet to 330 feet) (see Figure 2.2-36). In addition, at S8A MP 13.3 to 13.4, both of the existing 220-kV double-circuit LSTs would be replaced with 220-kV double-circuit 3-pole structures (see Figure 2.2-37 and 2.2-71) to allow for the crossing of existing T/Ls in this area.

To minimize the height of the new Mira Loma – Vincent 500-kV T/L as it crosses the existing 220-kV circuits near Fullerton Road (at approximately S8A MP 13.3) and maintain adequate clearance from existing permanent structures near Fullerton Road, the Mira Loma – Walnut 220-kV T/L, Olinda – Walnut 220-kV T/L, Center – Olinda 220-kV T/L, and Mira Loma – Olinda 220-kV T/L circuits would be reconfigured. Three new 220-kV double-circuit LSTs, west of Fullerton Road, would be installed to take the Olinda – Walnut 220-kV T/L and Center – Olinda 220-kV T/L circuits underneath the new Mira Loma – Vincent 500-kV T/L. These towers would be installed within a new approximately 2,000-foot-long, 100-foot-wide ROW, which would extend from the point at which the Olinda – Walnut 220-kV T/L and the Center – Olinda 220-kV

T/L cross under the new Mira Loma – Vincent 500-kV T/L and extend in a south-southeast direction re-entering the existing north-south corridor.

The three 220-kV double-circuit LSTs and two spans of the Olinda – Walnut 220-kV T/L and Center – Olinda 220-kV T/L circuits, within the existing north-south corridor at Fullerton Road, would be removed. One 220-kV double-circuit LST tap structure on the Mira Loma – Walnut 220-kV T/L and Mira Loma – Olinda 220-kV T/L, east of Fullerton Road in the east-west corridor, would be removed and replaced with one shorter, 220-kV double-circuit LST tap structure to facilitate the Mira Loma – Olinda 220-kV T/L crossing underneath the new Mira Loma – Vincent 500-kV T/L.

In two locations east of Fullerton Road, additional 220-kV double-circuit LSTs would be installed in the Mira Loma – Walnut 220-kV T/L and Mira Loma – Olinda 220-kV T/L to maintain clearances to the new adjacent 500-kV T/L.

At the location where the existing 220-kV double-circuit structures cross under the new Mira Loma – Vincent 500-kV T/L (S8A MP 13.3 to 13.4), two 220-kV double-circuit LSTs would be replaced with a 220-kV double-circuit three-pole steel pole dead-end structure to facilitate the Olinda – Walnut and Center – Olinda 220-kV T/Ls crossing underneath the new Mira Loma – Vincent 500-kV T/L (see Figure 2.2-37).

From S8A MP 13.4 to 13.55 the alignment would continue east, where the existing 220-kV double-circuit LSTs would be replaced with new 500-kV double-circuit LSTs (see Figure 2.2-38). From S8A MP 13.55 to 19.2 the alignment would continue east, where the existing single-circuit Chino – Mesa 220-kV T/L LSTs would be replaced with new 500-kV double-circuit LSTs (see Figure 2.2-39). From S8A MP 19.2 to 22.9, the alignment would shift to a northeasterly direction, where the existing single-circuit Chino – Mesa 220-kV T/L would continue to be replaced with 500-kV double-circuit LSTs (see Figure 2.2-40). From S8A MP 22.9 to 26.4, the single-circuit 220-kV LSTs would instead be replaced with 500-kV double-circuit TSPs (see Figure 2.2-41). From S8A MP 26.4 to 26.8, the existing 220-kV single-circuit dead-end TSPs would be replaced with 500-kV double-circuit TSPs (see Figure 2.2-42).

From approximately S8A MP 26.8 to 27.55, the alignment would turn north along 6th Street in Chino, where the existing single-circuit Chino – Mesa 220-kV LSTs to the west would be replaced with 500-kV double-circuit TSPs (see Figure 2.2-43). The alignment would then turn east at S8A MP 27.55 and proceed along Edison Avenue past Chino Substation towards Mira Loma Substation. From S8A MP 27.55 to 28.3, the existing 220-kV single-circuit LSTs, which currently carry the Chino – Soquel 66-kV line, would be replaced with 500-kV double-circuit TSPs to carry the new Mira Loma – Vincent 500-kV T/L (see Figure 2.2-44). The Chino – Soquel 66-kV lines would be converted to underground for approximately 4,000 feet, from 500 feet west of Central Avenue (approximately S8A MP 27.55) to the rack at the Chino Substation (see 220-kV Transmission and 66-kV Subtransmission Relocation discussion below for additional details).

From S8A MP 28.3 to 29.2, Subsegment 8A would continue east past the Chino Substation paralleling Subsegment 8B (see discussion below for details regarding Subsegment 8B). Within this portion of the alignment, the existing 220-kV double-circuit contemporary structures would be replaced with 500-kV double-circuit TSPs (see Figure 2.2-45).The northern circuit of the new double-circuit 500-kV structures would be the new Mira Loma – Vincent 500-kV T/L (Subsegment 8A) and the southern circuit would be the new Chino – Mira Loma No. 3 220-kV T/L (Subsegment 8C). Continuing east from S8A MP 29.2 to 34.0, the existing 220-kV double-circuit contemporary structures would continue to be replaced with 500-kV double-circuit TSPs, for tangent structures, or LSTs, for dead-end structures (see Figure 2.2-47).

Beginning at approximately S8A MP 34.0, Subsegment 8A would turn north for approximately 0.45 mile. Along this portion of the alignment, the existing ROW would be expanded from 175 feet to 325 feet (150-foot-wide new ROW). The new Mira Loma – Vincent 500-kV T/L would be installed on new 500-kV single-circuit LSTs from S8A MP 34.0 to 34.15 (see Figure 2.2-50). From S8A MP 34.15 to 34.4, the new Mira Loma – Vincent 500-kV T/L would be installed on new 500-kV single-circuit TSPs (see Figure 2.2-51). At this point, Subsegment 8A would turn east into the existing corridor for approximately 0.8 mile to the Mira Loma Substation. From S8A MP 34.4 to 34.5, the new Mira Loma – Vincent 500-kV T/L would be installed on new 500-kV single-circuit LSTs south of the existing Lugo – Serrano 500-kV T/L (see Figure 2.2-52). From S8A MP 34.5 to 35.0, the new 500-kV towers would switch from LSTs to TSPs (see Figure 2.2-53), and from S8A MP 35.0 to 35.2 (Mira Loma Substation), the new 500-kV towers would switch back from TSPs to LSTs (see Figure 2.2-54).

As noted above, Subsegment 8C, or the new Chino – Mira Loma No. 3 220-kV T/L, would parallel Subsegment 8A as the southern circuit on the new 500-kV double-circuit towers between Chino Substation (S8A MP 28.3) and S8A MP 34.0. Continuing east from S8A MP 34.0, the new Chino – Mira Loma No. 3 220-kV T/L would utilize the existing double-circuit 220-kV towers to connect into Mira Loma Substation.

Subsegment 8B: Chino-Mira Loma No. 1 220 kV and Chino-Mira Loma No. 2 220 kV T/Ls

Subsegment 8B begins at the Chino Substation (S8B MP 0.0 or S8A MP 28.3) and ends at the Mira Loma Substation (S8B MP 6.8). From S8B MP 0.0 to 0.75, the alignment would proceed east out of the Chino Substation, where the existing Chino – Mira Loma No. 1 220-kV T/L (single-circuit LSTs) would be replaced with 220-kV double-circuit LSTs to accommodate the Chino – Mira Loma No. 1 220-kV and Chino – Mira Loma No. 2 220-kV T/Ls (see Figures 2.2-45 and 46). At S8B MP 0.75, the line would turn northeast until approximately S8B MP 3.2, at which point the alignment would turn east until approximately S8B MP 5.05. Again, the existing Chino – Mira Loma No. 1 220-kV T/L (single-circuit LSTs) would be replaced with 220-kV double-circuit LSTs (see Figure 2.2-48). At S8B MP 5.05, the line would jog northeast paralleling the existing Lugo – Mira Loma No. 3 500-kV T/L for approximately 0.2 mile and then turn east for approximately 0.4 mile. From S8B MP 5.05 to 5.65, the existing Chino – Mira Loma No. 1 220-kV T/L (220-kV double-circuit LSTs) would be replaced with new 220-kV double-circuit LSTs (see Figure 2.2-49). From S8B MP 5.65 to 6.0, Subsegment 8B would turn south paralleling Subsegment 8A along new, expanded ROW (see Figures 2.2-50 and 51). At S8A MP 6.0, the alignment would turn east into Mira Loma Substation (S8B MP 6.8). Within this portion of the alignment, the existing Chino – Mira Loma No. 1 220-kV T/L (220-kV double-circuit LSTs) would be replaced with new 220-kV double-circuit LSTs (see Figure 2.2-55).

220-kV Transmission and 66-kV Subtransmission Relocation

There are various subtransmission and distribution lines in the areas of Mesa Substation and Chino Substation that would require relocation as part of Segment 8. At the San Gabriel Junction (S8A MP 2.2), the 220-kV double-circuit structures of the existing Laguna Bell – Rio Hondo 220-kV T/L and Mesa – Rio Hondo 220-kV T/L and the existing Mesa – Walnut 220-kV T/L and Center – Mesa 220-kV T/L would be removed and replaced with shorter, 220-kV double-circuit three-pole steel dead-end structures to facilitate crossing underneath the new Mira Loma – Vincent 500-kV T/L. In this location, one 66-kV double-circuit span, located approximately 300 feet west of these 220-kV double-circuit structures, would be installed underground for approximately 400 feet to allow for this reconfiguration.

On the eastside of the San Gabriel River Freeway, at approximately S8A MP 4.5, two double-circuit LSTs accommodating the Center – Mesa 220-kV T/L and Center – Olinda 220-kV T/L, would be replaced with

shorter LSTs to allow for the over crossing of the new Mira Loma – Vincent 500-kV T/L. One double-circuit 66-kV span, located approximately 250 feet east of these 220-kV double-circuit structures, would be installed underground for approximately 250 feet to allow for this reconfiguration.

West of the Chino Substation and south of Edison Avenue, from approximately S8A MP 26.8 to 28.3 (from south of Eucalyptus Avenue to the Chino Substation), the existing 220-kV single-circuit LSTs accommodating the Chino-Soquel 66-kV T/L would be removed. To facilitate the Chino-Soquel 66-kV T/L, a total of seven 220-kV single-circuit LSTs would be replaced with 14 ~~55~~ LWSPs. The 14 LWSPs would be used on the west side of Central Avenue where the Chino-Soquel 66-kV line would parallel the proposed 500-kV T/L (SCE, 2009d – Question 05). The remaining portion of the 66-kV line, from approximately 500 feet west of Central Avenue (S8A MP 27.55) to the rack at Chino Substation, would be converted to underground for approximately 4,000 feet in order to make room for the new Mira Loma – Vincent 500-kV T/L. Based on SCE's preliminary design assumptions, the remaining subtransmission lines and distribution lines on South Edison Avenue and ~~Furthermore,~~ from approximately 500 feet west of Central Avenue (S8A MP 27.55) to 100 feet east of Magnolia Avenue (S8A MP 28.7), ~~multiple existing 66-kV lines on Edison Avenue~~ would be converted to underground ~~for approximately 5,500 feet into the rack at the Chino Substation~~. Please refer to Figures 3.14-52a and 3.14-52b for photo simulations of Edison Avenue looking east from Central Avenue.

2.2.9.2 Engineering Details

Structures

Segment 8 would have a total of 154 LSTs consisting of two single-circuit 220-kV LSTs, as shown in Figure 2.2-64; 57 double-circuit 220-kV LSTs, as shown in Figure 2.2-69; three single-circuit 500-kV LSTs, as shown in Figure 2.2-65; and 92 double-circuit 500-kV LSTs, as shown in Figure 2.2-68. The LSTs would be constructed of dulled galvanized lattice steel angle members connected by steel bolts. The heights of the single-circuit 220-kV LSTs would be 65 feet to 75 feet; double-circuit 220-kV LSTs would be 113 feet to 180 feet; single-circuit 500-kV LSTs would be 128 feet to 149 feet; and double-circuit 500-kV LSTs would be 147 feet to 255 feet. (Note: These estimated heights are specific to Segment 8 and differ from the "typical" structure heights denoted in the referenced figures.)

Segment 8 would also have a total of 67 TSPs consisting of two single-circuit 220-kV TSPs, as shown in Figure 2.2-74; 11 double-circuit 220-kV TSPs, as shown in Figure 2.2-73; four single-circuit 500-kV TSPs, as shown in Figure 2.2-66; and 50 double-circuit 500-kV TSPs, as shown in Figure 2.2-67. The TSPs would be constructed of dulled galvanized steel. The heights of the single-circuit 220-kV TSPs would be 85 feet to 95 feet; double-circuit 220-kV TSPs would be 75 feet to 115 feet; single-circuit 500-kV TSPs would be 120 feet to 170 feet; and double-circuit 500-kV TSPs would be 150 feet to 195 feet. (Note: These estimated heights are specific to Segment 8 and differ from the "typical" structure heights denoted in the referenced figures.)

In Segment 8, there would also be approximately five 220-kV three-pole dead-end structures, as shown in Figure 2.2-71. The height for these structures would range from 75 feet to 110 feet. In addition, a total of approximately 55 ~~14~~ double-circuit 66-kV LWSP structures would be required, as shown in Figure 2.2-72, and would be up to 80 ~~60~~-feet tall. Approximately six TSP riser poles up to 80-feet tall would also be used. (Note: These estimated heights are specific to Segment 8 and differ from the "typical" structure heights denoted in the referenced figures.)

Conductors

The two 500 kV subsegments of Segment 8 (Subsegments 8A and 8C) would be strung with approximately 175,500 feet per circuit of 2B-2156 kcmil ACSR with nonspecular finish. A total of approximately 2,106,000 feet of conductor would be strung. This type of conductor is a twin bundle with two 2156 aluminum conductor steel reinforced (ACSR) conductors, where each 2156 ACSR conductor has a diameter of 1.76 inches.

The 220-kV subsegment of Segment 8 (Subsegment 8C) would be strung with approximately 37,800 feet per circuit of 2B-1590 kcmil ACSR with nonspecular finish. A total of approximately 453,600 feet of conductor would be strung. This type of conductor is a twin bundle with two 1590 ACSR conductors, where each 1590 ACSR conductor has a diameter of 1.50 to 1.55 inches.

Insulators

The tangent and angle 500-kV insulator assemblies would consist of two strings of insulators in the form of a "V." Depending on the load, each leg of the "V" assembly would contain one or two one-piece gray polymer insulators. On the dead-end structures, the insulators would be arranged in a "barrel" configuration consisting of four polymer insulators.

Overhead Ground Wires

The overhead ground wires would be located on the peaks of the transmission structures. The structures would have two overhead ground wires. One overhead ground wire would be approximately 11/16 inch in diameter and contain optical fibers for line protection and communications; the other ground wire would be approximately 0.5 inch in diameter.

2.2.10 Segment 9: Substation Facilities

Segment 9 addresses the addition and upgrade of substation facilities. The proposed Project includes the following: the 500/220-kV Whirlwind Substation (the only new facility that would be constructed); upgrades to the existing Antelope, Vincent, Mesa, Gould, and Mira Loma Substations in order to accommodate new 500/220-kV equipment; and acquisition of approximately ~~18~~ 20.2 acres (combined total) of additional substation property at the Antelope and Vincent Substations.

2.2.10.1 Whirlwind Substation

Whirlwind Substation would be a new 500/220-kV substation located approximately 4 to 5 miles south of the Cottonwind Substation near the intersection of 170th Street and Holiday Avenue in Kern County (Figure 2.2-75). The site chosen for the new substation ~~would require~~encompasses approximately 106 acres, which would ~~need to~~ be acquired by SCE. Facilities associated with the proposed new substation, such as the substation pad, ~~and~~ access road, and retention pond would represent a permanent land disturbance of approximately 70~~65~~ acres (see Table 2.2-10 at the end of Chapter 2). In addition to the initial 70 acres, an area of approximately 27 acres (for a total of approximately 97 acres) would be graded within the fence line of the new substation to allow adequate room in the future for additional equipment that may be necessary to facilitate transmission of additional energy generation (see Section 2.9 – Cumulative Projects). No additional facilities or equipment would be installed as part of the proposed Project within this future expansion area.

Major Equipment and Structures

The proposed new Whirlwind Substation would include a 500-kV switchyard and a 220-kV switchyard to accommodate connection to area transmission lines. Some of the major equipments would include

transformers, buses, circuit breakers, capacitor banks, conductor and other associated equipments. Low-decibel equipment would be used, as available and applicable to the Project; final selection would occur during final design. ~~Refer to Table 2.2-19 (located at the end of Chapter 2) for a detailed description of the specific equipment assumed to be installed at the Whirlwind Substation.~~

The 500-kV switchyard would be designed to terminate the Midway – Whirlwind 500-kV T/L in a double breaker configuration, as well as the Vincent – Whirlwind 500-kV T/L and the No. 1AA transformer bank leads in a breaker-and-a-half configuration. The 500-kV switchyard would also accommodate termination of the new ~~Antelope~~Vincent – Whirlwind 500-kV T/L in a double breaker configuration and the new Whirlwind – Windhub 500-kV T/L in a double-breaker configuration.

The 220-kV switchyard would be designed to accommodate the termination of the proposed new Cottonwind – Whirlwind No. 1 T/L and Cottonwind – Whirlwind No. 2 T/L, as well as the installation of two 220-kV 79.2 Megavolt-Amps Reactive (MVAR) capacitor banks.

The new Whirlwind Substation would also include a Mechanical Electrical Equipment Room (MEER), which would be equipped with air conditioning and would house the following equipment: battery charger, batteries, light and power panel, AC distribution panel, direct current (DC) distribution panel, circuit breaker control switched, all required remote control (automation equipment), all required protective relay equipment, and IT/Telecommunication equipment. It would also include a four-legged, free-standing microwave antenna tower of approximately 190 feet in height, located within the substation property and immediately adjacent to the MEER and telecommunication equipment.

Substation Light and Power

The Whirlwind Substation's light and power system would be designed to the latest standards, with a primary and a back-up power source, as well as an emergency system provided by an onsite, approximately 250 kW, diesel generator.

The primary power source for the Whirlwind Substation would be the 13.8-kV tertiary buses of the new 1AA transformer bank and its related 500-kVA, three-phase transformer bank. The secondary power source for the Whirlwind Substation would be a new 12-kV line and its related 500-kVA, three-phase transformer bank. The new 12-kV distribution line would result from extending an existing 12-kV line for 1.7 miles along 70th Street (SCE, 2009f).

Adequate lighting would be provided for the new 500-kV and 220-kV switchyards as well as the new transformer and capacitor bank areas. In addition, single-phase and three-phase alternating current (AC) power outlets and test facilities would be installed within the new transformer bank and switchyard area.

Under normal operating conditions, the substation would not be illuminated at night. Lighting would be used only for maintenance outages or emergency repairs occurring at night. The location of the high-pressure sodium lights are in the switchyards, around the transformer banks, and in areas of the yard where operating and maintenance activities may take place during evening hours. Maintenance lights would be controlled by a manual switch and would normally be in the "off" position. The lights would be positioned to point downward and be shielded to reduce light spill outside of the facility.

Protection

Adequate protective relaying equipment for the new 500-kV and 220-kV lines, transformer, and capacitor banks would be installed in the new MEER per latest protection requirements.

Substation Ground Grid

SCE would install a new grounding grid using 350 kcmil ACSR for the new 500-kV and 220-kV switchyard areas. This type of conductor has a diameter of approximately 0.75 inches (Note: This is a non-standard conductor so the diameter may vary slightly). All new 500- and 220-kV equipment would be grounded to the new grid using 350 kcmil ACSR. The design for the final ground grid would be determined after the performance of the grounding study. The station ground grid would be extended outside of the station's fence and main gates and for the required distances to provide safety to personnel.

2.2.10.2 Antelope Substation

Segment 9 includes an upgrade of the Antelope Substation in order to accommodate new 500-kV transmission equipment (see Figure 2.2-1g). The proposed expansion to 500 kV of the Antelope Substation has been licensed and was addressed in the Proponent's Environmental Assessment (PEA) submission to support the Antelope Transmission Project, Segment 1. The exceptions to the licensing were the installation of a 200 MVAR Static VAR Compensator (SVC) and two 500-kV, 150 MVAR each, shunt capacitor banks. The installation of the new equipment would be in an area of approximately 18 ~~12~~ acres. Approximately 20 ~~18~~ acres of ~~the~~ additional land would be acquired by SCE; the additional land at the substation site would accommodate the additional new construction at the Antelope Substation (see Figure 2.2-76).

Relocation of the Sagebrush Subtransmission Line. ~~As discussed in Section 2.2.5.1 (Segment 5: Antelope – Vincent No. 2 500 kV T/L, Routing Details), a~~As part of the expansion of the Antelope Substation, the existing Sagebrush subtransmission line would be re-routed around the 500-kV expansion area (The Sagebrush line currently bisects this area). Beginning just south of West Avenue J, the Sagebrush line would be re-routed southeast for approximately 1,500 feet, paralleling the east side of the 500-kV expansion area, before turning southwest for approximately 1,500 feet, paralleling the south side of the 500-kV expansion area, to rejoin the existing alignment (SCE, 2008k).

Major Equipment and Structures

The expansion of Antelope Substation would be designed to accommodate the installation of a 500-kV switchyard, a 500-kV SVC yard, a 500/220/13.8-kV transformer yard, two 500-kV shunt capacitor banks, applicable number of 13.8-kV tertiary reactor banks, a new control building, and the necessary station light and power system. The 500-kV switchyard would be designed in a breaker and a half configuration to accommodate termination of the Vincent – Whirlwind 500-kV T/L, Antelope – Windhub 500-kV T/L, Antelope – Vincent No. 1 500-kV T/L, Antelope – Vincent No. 2 500-kV T/L, and No. 1AA and 2AA 500/220/13.8-kV transformer banks. Initially, two 500-kV bays would be equipped with three 500-kV breakers and two 500-kV bays would be equipped with two 500-kV breakers. 500-kV shunt capacitor banks would be located at one end of the 500-kV buses. Two sets of AA transformer banks would be terminated on two existing 220-kV bays at the substation. Steel structures and related foundation would be provided for the 500-kV T/Ls, AA banks, AA bank leads, and related supporting equipment. ~~Major equipment and structures proposed for installation at the Antelope Substation would include two 500-kV, 150 MVAR each capacitor banks (No. 1 and No. 2), and a new 500 kV SVC. Refer to Table 2.2-20 (located at the end of Chapter 2) for a detailed description of the specific equipment assumed to be installed at the Antelope Substation.~~ Final equipment selection would occur during the final design to search for available and applicable low-decibel equipment.

~~A new MEER would be installed for the SVC in the expanded area and would house protective relays, controls, and medium voltage equipment. The installed shunt capacitor bank protective relaying equipment would be in the existing 500 kV MEER.~~Other major equipment and structures proposed for installation at the Antelope Substation would include a new control building to house a control/relay room, a security room, a telecommunication room, two battery rooms, and a control cable basement. The control building would be equipped with air-conditioning and smoke/fire detection. The new substation equipment would also include 500-kV SVC equipment and control building to be located within the SVC yard. The control/relay room would house the new protective relay, monitoring, recording, and control/automation related equipment, including AC and DC distribution panel boards, outdoor lighting control panels, battery chargers, and other supporting equipment. A telecommunication room would also be installed to house the telecommunication equipment and be arranged to interface with one approximately 185-foot tall microwave tower. A security room would house security related equipment and a UPS.

Substation Light and Power

The existing station light and power system, including the existing related switchgear at Antelope Substation would be rearranged and augmented to include sufficient emergency generator capacity and receive primary power source from the AA transformer's 13.8-kV bus. The 500-kV switchyard would be provided with properly sized station light and power system according the latest standards to include a primary, a back-up, and an emergency power source. The primary power source for the Antelope Substation would be from the 13.8-kV tertiary buses of a new AA transformer bank and its related auxiliary step down transformer. The secondary power source would be from a new 12-kV line. The emergency power source would be from a diesel generator. Automatic control and switching equipment would be included.

Outdoor road lighting would be provided for the substation's internal roads and access areas. Outdoor equipment maintenance lighting would be provided for the 500-kV switchyard equipment, 500/220/13.8-kV auto-transformers, 500-kV SVC equipment, and 500-kV/220-kV shunt capacitor bank equipment. Auxiliary three phase and single phase AC power for testing and maintenance related work would be provided.

~~An upgrade would not be required to the substation's existing power system. Additional lighting would be provided for the new 500 kV SVC and shunt capacitor banks.~~ Under normal conditions, the substation would not be illuminated at night. Lighting would be used only for emergency repairs or maintenance outages during evening hours. The high-pressure sodium lights are located in the switchyards, around the transformer banks, and in areas of the yard where operating and maintenance activities may take place during evening hours. A manual switch, usually in the "off" position, would control~~s~~ the maintenance lights. The lights would be positioned to point downward and be shielded to reduce light spill outside of the facility.

Substation Ground Grid Extension

~~A new underground grid would be installed in the entire extended substation area and would extend 3 feet beyond the perimeter fence. The grid conductor would be 350 kcmil soft drawn copper with 50-foot maximum spacing (25-foot spacing at grid edge).~~ The Antelope Substation's extended areas would be provided with a ground grid system to provide personnel and equipment protection during high voltage fault current incidents. The ground grid would be arranged according to a grounding study to meet standard grounding requirements that are applicable to the site's ground resistivity measurements. The substation's grounding system would include appropriate ground grid layout that contains the necessary size and quantity of buried grounding conductors. Where necessary, the substation's ground grid would be extended to the outside of the substation's

gates to ensure public safety. All above grade equipment and structures located within the substation would be provided with the applicable number of properly rated grounding connections.

2.2.10.3 Vincent Substation

In order to accommodate the proposed transmission connections, Segment 9 requires an upgrade of the existing 500/220-kV Vincent Substation which would include two separate extensions of existing switchyards (see Figure 2.2-1j and 2.2-77). At the southwestern corner of the facility, the south 220-kV bus extension would require an addition to the existing limits of the graded pad. To match the existing site grade, a retaining wall would be constructed and back-filled. The 500-kV switchyard would be extended to the west by approximately 1,100 ~~880~~ feet, where extensive new grading would be required. The 500-kV substation expansion would be on the existing SCE-fee owned property. The 220-kV switchyard expansion would require approximately 0.2 acre of new property acquisition, and would disturb approximately 20 ~~18~~ acres of existing and new substation land. This activity is discussed in detail in Section 2.2.12.10, below.

Major Equipment and Structures

In the existing Vincent Substation 500-kV switchyard, the 500-kV switchrack would be expanded by four line positions with double or breaker-and-a-half arrangement in order to terminate the following transmission lines:

- Antelope – Vincent No. 1 500-kV T/L
- Antelope – Vincent No. 2 500-kV T/L
- Mira Loma – Vincent 500-kV T/L
- Other major equipment: two 500-kV 200 MVAR shunt capacitor banks and one 500-kV 600 MVAR SVC

The 220-kV switchyard would be upgraded and expanded. Low-decibel equipment would be used as available and applicable to the Project; final selection would occur during final design.

The Vincent Substation expansion would also require construction of a new 60-foot by 72-foot block wall control house attached to the existing control house. This expansion would have below-grade vault space and a tunnel between the outdoor cable trench and the vault for cable routing. The expansion would be equipped with dual air conditioning equipment to house lighting and power panels, AC/DC panels, and circuit-breaker control switches.

~~Refer to Table 2.2-21 (located at the end of Chapter 2) for detailed information regarding the equipment assumed to be installed at the Vincent Substation.~~

Substation Light and Power

The existing station power and lighting system, including the substation's emergency generator, would be replaced and relocated within the expanded substation yard.

Under normal operating hours, the substation would not be illuminated at night. Lighting would be used only for emergency repairs or maintenance outages during evening hours. The high-pressure sodium lights are located in the switchyards, around the transformer banks, and in areas of the yard where operating and maintenance activities may take place during evening hours. A manual switch, usually in the "off" position, controls the maintenance lights. The lights would be positioned to point downward and be shielded to reduce light spill outside of the facility.

Substation Ground Grid Extension

A new ground grid would be installed in the entire extended substation area and tied to the existing grid conductors. The new ground grid would extend 3 feet beyond perimeter fence. Grid conductor would be 350 kcmil soft drawn copper with 50-foot maximum spacing (25-foot spacing at grid edge).

2.2.10.4 Gould Substation

The Gould Substation portion of Segment 9 includes upgrade of the existing 220-kV switchyard to accommodate the connection of the new Eagle Rock - Gould 220-kV T/L, as well as the 220-kV connections of the existing transformer banks to double breaker positions (see Figure 2.2-1n). All upgrades at the Gould Substation would take place within the existing fence line.

Major Equipment and Structures

Within the existing 220-kV switchyard at the Gould Substation, equipment would be installed in the existing 220-kV switchyard to terminate the new Eagle Rock – Gould 220-kV T/L. ~~Refer to Table 2.2-22 (located at the end of Chapter 2) for a detailed description of the equipment assumed to be installed at the Gould Substation.~~ Final equipment selection would occur during the final design to search for available and applicable low-decibel equipment.

The MEER activities would include installation of all required protective relays for the new Eagle Rock – Gould 220-kV T/L. The MEER activities would also include installation of all required protective relays for the new 220-kV transformer banks circuit breakers.

Substation Light and Power

An upgrade to the substation's existing power system would not be required. New lighting would be provided for the new 220-kV bus extension area. Under normal operating hours, the substation would not be illuminated at night. Lighting would be used only for emergency repairs or maintenance outages during evening hours. The high-pressure sodium lights are located in the switchyards, around the transformer banks, and in areas of the yard where operating and maintenance activities may take place during evening hours. A manual switch, usually in the "off" position, controls the maintenance lights. The lights would be positioned to point downward and be shielded to reduce light spill outside of the facility.

Substation Ground Grid Extension

As the existing substation yard boundaries would not be modified under the proposed Project, no extension of the substation ground grid is required.

2.2.10.5 Mesa Substation

The Mesa Substation portion of Segment 9 includes upgrades of the existing 220-kV switchyard with additional equipment to accommodate the connection of the new Mesa – Vincent No. 1 220-kV T/L in Segment 11 (see Figure 2.2-1v). All upgrades at the Mesa Substation would take place within the existing fence line.

Major Equipment and Structures

Within the existing 220-kV switchyard at the Mesa Substation (a portion of Segment 11), work would be performed at existing 220-kV Line Positions 11 and 12 to terminate the new Mesa – Vincent No. 1 220-kV T/L. ~~Refer to Table 2.2-23 (located at the end of Chapter 2) for a detailed description of the new equipment assumed to be installed at the Mesa Substation.~~ Final equipment selection would occur during the final design to search for available and applicable low-decibel equipment.

The MEER activities would include installation of all required protective relays for the new Mesa – Vincent No. 1 220-kV T/L.

Substation Light and Power

An upgrade to the substation's existing power system is not required. Under normal operating hours, the substation would not be illuminated at night. Lighting would be used only for emergency repairs or maintenance outages during evening hours. The high-pressure sodium lights are located in the switchyards, around the transformer banks, and in areas of the yard where operating and maintenance activities may take place during evening hours. A manual switch, usually in the "off" position, controls the maintenance lights. The lights would be positioned to point downward and be shielded to reduce light spill outside of the facility.

Substation Ground Grid Extension

As the existing substation yard boundaries would not be modified under the proposed Project, no extension of the substation ground grid is required.

2.2.10.6 Mira Loma Substation

The Mira Loma Substation portion of Segment 9 would include the construction of a new 500-kV position to terminate the new Mira Loma – Vincent 500-kv T/L, as described under Segment 8 (see Figure 2.2-1y). All work would take place within the existing Mira Loma fence line.

Major Equipment and Structures

New equipment would be installed at existing 500-kV Line Position 2X to terminate the new Mira Loma – Vincent 500-kV T/L. ~~Refer to Table 2.2-24 (located at the end of Chapter 2) for a detailed description of the new equipment assumed to be installed at the Mira Loma Substation.~~ Final equipment selection would occur during the final design to search for available and applicable low-decibel equipment.

The MEER scope of work would include installation of all required protective relays for the new Mira Loma – Vincent 500-kV T/L on Line Position No. 2X.

Substation Light and Power

An upgrade to the substation's existing power system would not be required. Under normal operating conditions, the substation would not be illuminated at night. Lighting would be used only for emergency repairs or maintenance outages during evening hours. The high-pressure sodium lights are located in the switchyards, around the transformer banks, and in areas of the yard where operating and maintenance activities may take place during evening hours. A manual switch, usually in the "off" position, controls the maintenance lights. The lights would be positioned to point downward and be shielded to reduce light spill outside of the facility.

Substation Ground Grid Extension

As the existing substation yard boundaries would not be modified under the proposed Project, no extension of the substation ground grid is required.

2.2.11 Proposed Information Technology Facilities

All segments in the proposed TRTP would require installation of IT facilities. For Segment 9, telecommunications infrastructure would be installed to support operation of the new Whirlwind Substation, as well as to protect new transmission line facilities from electrical faults. The new circuits would include fault protection, supervisory control and data acquisition (SCADA), telephone, and if necessary, remedial action scheme (RAS).

For the transmission segments, the installation of optical ground wire (OPGW) is part of ~~an~~ all new transmission line construction along the length of the TRTP. OPGW is a specialized form of overhead ground wire (OHGW) that contains optical fiber strands within a central core, surrounded by the steel strands of the ground wire. The OPGW would be installed at the tops of transmission line towers in the same manner as the conventional OHGW during transmission line construction. As described in previous sections, the OPGW would be approximately 11/16 inch in diameter. A detailed description of construction requirements and activities associated with these IT facilities is in Section 2.2.12.11, below.

The planned demolition and reconstruction of 220-kV transmission lines in portions of TRTP Segments 6, 7, 8 and 11 would jeopardize SCE telecommunications optical fiber cable that is in service on those segments. This optical fiber cable is wrapped on the OHGW which is installed at the top of the structures that are slated for demolition.

To maintain continuity of service for the lightwave (LW) systems, and their subordinate circuits, presently transported on strands within the jeopardized optical fiber cables, alternative routes must be developed. The description below lists one or more of the following reroute measures that would be adopted by SCE. In each case, the strategy would be to have the optical fiber reroute constructed and placed in service before demolition started on the transmission lines.

- Move the LW systems to other existing optical fiber cables, on other routes, that are not impacted by demolition and rebuild plans.
- Create a new route on the same ROW by wrapping new optical fiber cable on the OHGW for an adjacent T/L that is not slated for demolition.
- Create a new route on the same ROW by stringing a different type of optical fiber cable on an adjacent T/L that is not slated for demolition. This method would consist of attaching all-dielectric-self-supporting (ADSS) fiber cable to the LST on the adjacent T/L. The installation of the ADSS would be lower than the bottom conductor(s) on the towers. This method could require inter-setting of additional poles to support the ADSS along the ROW if the span distances between the LSTs were greater than could be accommodated with available ADSS technology. SCE has estimated that approximately 50 to 60 interset poles would be required (SCE, 2007b – DR#1: Q069).
- Build new optical fiber cables on entirely different routes. This method would identify routes with existing T/L structures that would be suitable for attaching fiber cable.
- Construct an underground conduit segment and relocate the optical fiber cable within the new conduit to avoid planned T/L tower demolition. This method would only be practical for short distances on existing ROW, where only one or two spans of wrapped fiber are in jeopardy. SCE has identified two preliminary locations within Segment 11 where fiber optic cables would be placed underground (SCE, 2007b – DR#1: Q069):

(1) Just outside of Vincent Substation, approximately 1,600 feet would be constructed underground between the last two 220-kV towers for the Pardee – Vincent No. 1 220-kV T/L where the existing OHGW is planned for removal.

(2) Just east of Goodrich Substation, approximately 800 feet would be constructed underground between structures 103 and 105.

Final decisions regarding the optimal strategies for ensuring service continuity for the LW systems would be decided during the Project's final engineering phase.

Currently, SCE has determined that between the Windhub Substation and SCE's existing Rosamond Substation, SCE would need to construct approximately 16 miles of ADSS fiber optic cable on a route to be determined. Similarly, between Whirlwind Substation and Rosamond Substation, SCE would need to construct approximately 14 miles of ADSS fiber optic cable on a route to be determined. Both ADSS routes are required to "close" planned lightwave transmission rings, where OPGW does not complete the entire ring. ADSS fiber optic cable consists of an overall black plastic jacket surrounding strength members and 48 fiber optic strands. The nominal outside diameter of the cable is approximately 5/8 inch. The ADSS cable would be suspended from cross arms bolted to wooden structures (poles). The cable would be installed approximately 25 feet above grade. Poles used for ADSS installations are identical to, and frequently shared with, those used for electric utility distribution or subtransmission service. In many cases, the same poles serve multiple purposes, with utility ADSS being just one of the several attachments on the poles.

2.2.12 Proposed Project Construction

2.2.12.1 Transmission Line Construction

Construction activities for the proposed Project would include establishment of marshalling yards for staging of materials and equipment, and development of access roads and spur roads to reach construction sites. Following this, or in parallel, crews would remove existing transmission lines as specified for Segments 5 through 8 and Segment 11, and also begin installation of new transmission structures. Construction of new transmission towers would include clearing of footing work locations, installation of foundations, tower assembly, and tower erection. After towers are in place, crews would proceed with stringing of conductor and overhead ground wires. Construction would be completed with clean-up of construction sites and demobilization of personnel and equipment. The exact method of construction employed and the sequence with which construction tasks occur would be dependent on final engineering, contract award, conditions of permits, and contractor preference. In general, construction efforts would occur in accordance with accepted construction industry standards. Construction activities would generally be scheduled Monday through Friday during daylight hours (7:00 a.m. to 5:00 p.m.). When different hours or days are necessary, SCE would obtain variances, as necessary, from the jurisdiction in which the work would take place. All materials associated with construction efforts would be delivered by truck or helicopter to established marshalling yards. Delivery activities requiring major street use would generally be scheduled to occur during off-peak traffic hours where feasible. Public access to defined areas would be restricted where deemed necessary by land managing agencies to protect public health and safety.

The following sections provide more detailed information about the construction tasks that would be associated with transmission line construction for the TRTP.

2.2.12.2 Staging and Support Areas

Marshalling and Material Storage Yards (SCE, 2007a and SCE, 2008a)

Marshalling yards are typically large areas (5 to 50 acres) that are located at both ends of a bulk power T/L construction project (Conventional Line Construction and/or Helicopter Supported Line Construction types). On larger projects there could additionally be one or more of these yards located at strategic locations approximately every 25 line miles along the project route. Similarly, material storage yards are typically 5 to 20 acres in size and are used primarily for material storage and staging. Delivery trucks with material (i.e., steel rebar cages, tower steel, TSPs, conductor reels, structure hardware, and other related material) would be delivered and off loaded at these yards. Ideally these yards should be as level as possible and should be located in an uninhabited area free of trees and high voltage power lines. In some instances, because of the presence of vegetation and/or an uneven surface, the area required for a specific yard may need to be brushed, grubbed, and /or graded. Preparation of the primary yards would include the application of road base, installation of perimeter fencing, and implementation of SWPPP best management practices. Additionally, it may be necessary to install a temporary fence around the yard for security purposes.

Activities, facilities, equipment, and material which could be present at the marshalling and material storage yards for the duration of the project include, but are not limited to, the following:

A. Employee gathering/reporting area; employees working on the project will drive their personal vehicles to these yards and temporarily park them at the yard for the duration of the work day.

B. Heavy and light (gas or diesel) construction equipment will be used and stored at these yards. The equipment will be fueled, serviced, and will receive any necessary light maintenance, while at these yards.

C. Office trailers of various sizes and portable toilets will be located in these yards. Portable electrical generators (if no electrical power source is available) will be used; telecommunication lines may also be required to support the office trailers.

D. All types of material needed for the construction of the T/L (i.e., tower steel, conductor reels, OPGW and/or ground wire reels, tower bolts, foundation rebar cages, wood guard poles, etc.) will be delivered and stored at these yards until it is ready to be delivered to the structure sites.

E. These yards should be located near water supplies for construction use and dust control as much as 50,000 gallons of water could be used daily.

F. Roll-off dumpsters to gather the construction waste from the project will be located at these yards.

G. Fueling trucks, gas and diesel, will be located at these yards to fuel construction equipment and vehicles each day of construction; the fueling truck tanks could hold from 100 to 1,000+ gallons of fuel.

H. When a portion of the transmission line project is required to be constructed using helicopter support, these yards could also serve as a helicopter support yard for fueling, maintenance, and transporting both material and personnel to and from the structure site locations.

I. Sectionalized tower assembly could also take place at these yards in support of those portions of the transmission line project that are required to be constructed using helicopters support. These sectionalized portions of towers would be flown out of these yards by heavy duty helicopters and delivered to the appropriate structure site location.

Where applicable, the Material Safety Data Sheet (MSDS) for each of the materials and chemicals to be used on the job site would be referenced; SCE and/or its contractor would then follow the recommendations on the MSDS, adhere to the procedures in the Storm Water Pollution Prevention Plan (SWPPP) prepared for the Project, and conform to all applicable laws and regulations regarding the storage and containment of the materials and chemicals to be used during all construction-related activities (SCE, 2007b – DR#1: Q073).

This Project would include several primary marshalling and/or material storage yards that would be selected based on accessibility to construction locations and proximity to transmission line and substation access roads; however, where possible, pre-disturbed areas would be used. For example, SCE has preliminarily identified four potential marshalling and/or material storage yards within Segment 11, including an approximately 4 acre area east of S11 MP 3.75 just north of Aliso Canyon Road, an approximately 7 acre area also east of S11 MP 3.75 but south of Aliso Canyon Road, an approximately 20 acre area west of S11 MP 14.5, and an area approximately 32 acres in size just east of Vincent Substation on the east side of Angeles Forest Highway. Once sites for primary yards are determined, biological and cultural resource reviews would be conducted, as well as a visual resource review for sites on NFS lands, before final site selection.

In addition to the primary yards, secondary yards would be established for short-term utilization near construction sites. Where possible, the secondary yards would be sited in areas of previous disturbance along the construction corridors. Final siting of these yards would depend upon availability of appropriately zoned property that is suitable for this purpose and would not be determined until engineering, property negotiations, and Project approvals are finalized (SCE, 2007b – DR#1: Q003). Locations would be selected that are parallel to the existing ROW, near paved roads and preferably on land that has been previously graded or disturbed (SCE, 2007b – DR#1: Q071). The number and size of the secondary yards would be dependent upon a detailed ROW inspection and would take into account, where practical, suggestions by the successful bidder for the work. Typically, an area approximately 1 to 3 acres would be required for the secondary yards, and they would be located approximately every 5 to 10 miles along the T/L alignment (SCE, 2007b – DR#1: Q071). Once the sites for secondary yards are proposed, biological and cultural resource reviews would be conducted, as well as a visual resource review for sites on NFS lands, before final site selection. Preparation of the secondary yards would include installation of perimeter fencing, and implementation of SWPPP best management practices. Application of road base may also occur, depending on existing ground conditions at the yard site.

In addition to primary and secondary marshalling and/or material storage yards, helicopter staging/support facilities would also be required, as SCE has estimated that approximately 17 towers in Segment 6 and 16 towers in Segment 11 would be constructed by helicopter, as shown in Figure 2.2-83. In general, the following types of helicopter staging and support facilities are required for installation by helicopter:

Helicopter LST & TSP Assembly Yards (SCE, 2008a)

The assembly yards are required so that sections of the LSTs can be preassembled prior to delivery to the structure sites. A large heavy-lift helicopter will fly from these yards and transport the preassembled section of the LST to the structure site. Depending on the size and weight of the LST, several round trips will be required from the assembly yard to fully construct each LST. Each assembly yard can support several structure sites and must be located no further away from the structure site locations than is within the safe round trip flight distance limitation of the helicopter(s) being used. The typical safe round trip flight distance for a heavy lift helicopter is a two to three mile radius, depending upon altitude and load. The area required for these assembly yards can range in size ~~from a minimum of 300 foot by 300 foot or larger~~ and depends~~ing~~ on road

access and topography. ~~the area of land that is available.~~ The yards should be as level as possible, and be located strategically throughout the area of helicopter supported construction activity. In some instances, because of the presence of vegetation and/or an uneven surface, the area required for a specific yard may need to be brushed, grubbed, and /or graded, including removal of trees in some instances. Ideally they should be located at a higher elevation than the structure sites they will support because it is safer and more fuel efficient to fly down toward the tower site with heavy loads than it is to fly up to the tower site. Additionally, the assembly yard must be accessible by a road to facilitate the delivery of tower steel, rebar, concrete, construction tools, equipment, and other materials used in the construction of the foundations and the LSTs.

Specially designed TSPs (i.e., less than 220 kV) can also be delivered by helicopter to the structure site locations from these assembly yards. The TSPs assembly and the installation of cross arms on the upper sections of the TSP will take place at the assembly yard. The helicopter lifting capacities will dictate the actual components of the TSP that will be assembled at the yard.

The following activities can take place at helicopter assembly yards:

A. Tower sections would~~will~~ be preassembled using a rough terrain crane to support the steel while air compressor supported impact wrenches are used to torque the bolts in place.

B. Rebar for assembling cages and/or preassembled rebar cages for structure foundations would be delivered then flown out of this yard to each structure site.

C. A concrete batch plant would generate the required concrete to be loaded into a truck or ~~Trucks would deliver concrete which would be loaded into a~~ concrete transport bucket that would be attached to a helicopter and flown out to the structure sites.

D. The refueling of the helicopter and necessary light maintenance. A fuel truck and a mechanics truck would be located at these yards.

E. The transportation of personnel, tools, and small equipment by helicopter to and from the yards and the construction sites.

F. Temporary parking for a fuel truck, a mechanics truck, and transport vehicles for personnel.

G. To serve as a safe landing area for the helicopter in case of an emergency.

Assembly yards (referenced herein as helicopter staging areas) have been preliminarily identified by SCE to support the helicopter construction of approximately 33 towers along Segments 6 and 11. It has been assumed that each helicopter staging area would be approximately 4 acres in size (on average), although the size could range substantially depending on the land available and intended uses. These staging areas are shown in Figure 2.2-83 (located at the end of Chapter 2), and are described below and in Table 2.2-40 located near the end of Chapter 2 (SCE, 2008i):

(1) SCE#0: Adjacent to Beartrap Canyon, south of Aliso Canyon Road, and approximately 0.45 mile east of S11 MP 3.9 (off NFS lands – private in-holding);

(2) SCE#1: Along north side of Mt. Gleason Road, approximately 0.3 mile east of S11 MP 7.6;

(3) SCE#2: Along and south of Forest Road 3N27, immediately west of S11 MP 9.3 near Structure #36;

(4) SCE#3: Along and north of Forest Road 3N27, west of S11 MP 10.75;

(5) SCE#3B: Terraced area near Big Tujunga Dam, approximately 0.15 mile west-southwest of Big Tujunga Canyon Road and S11 MP 14.5 (Same as Alternative 6, Site #8);

(6) SCE#4: Adjacent to and west of Mt Lukens Road (Forest Road 2N76.3), Angeles Crest Station, and S11 MP 18.0 (off NFS lands);

(7) SCE#5: Along Forest Road 2N69 just north of Gould Substation and west of S11 MP 18.6 (off NFS lands);

(8) SCE#6: West of Shortcut Station adjacent to Upper Big Tujunga Canyon Road (Forest Road 3N19), approximately 0.35 mile west of S6 MP 16.5;

(9) SCE#6B: Accessed via Barley Flats Road, approximately 1.8 miles west of S6 MP 16.75 (Same as Alternative 6, Site #7);

(10) SCE#7: Adjacent to Rincon-Redbox Road in the Newcomb Pass area, approximately 0.36 mile west of junction with Shortcut-Edison Trail, just west of S6 MP 19.5 (Same as Alternative 6, Site #9);

(11) SCE#8: West of Van Tassel Motorway in Monrovia, west of S6 MP 26 (Same as Alternative 6, Site #11);

(12) SCE#9: Fish Canyon Rifle Range, 1.2 miles east of S7 MP 0.6 accessed via Fish Canyon Road in Azusa (off NFS lands); and

(13) SCE#10: Southwest of Cogswell Reservoir, accessed via Highway 39, San Gabriel Canyon Road.

Final siting of all helicopter staging and support areas for the TRTP would be conducted with the input of the helicopter contractor, and affected private landowners and land management agencies, such as the Forest Service. The size of each helicopter staging and support area would be dependent upon the size and number of towers to be installed.

Helicopter Support Yards (SCE, 2008a)

Helicopter support yards are required when using helicopters for T/L construction because of the limited fuel supply that helicopters are able to carry. These yards must be located no further away from the structure site locations than is within the safe round trip flight distance limitation of the helicopter(s) being used. The typical safe round trip flight distance for a heavy lift helicopter is a two to three mile radius, depending upon altitude and load. These yards range in size from a minimum of 100-foot by 100-foot or larger depending on the size of the helicopter and the activities taking place at the yard. The yards must be accessible by a road, be as level as possible, and be located strategically throughout the area of helicopter supported construction activity. In some instances, because of the presence of vegetation and/or an uneven surface, the area required for a specific yard may need to be brushed, grubbed, and /or graded.

Ideally, the support yards are at the same physical location as the assembly yards (described above); this capability reduces the hours of helicopter operation by eliminating the transport time from a support yard to an assembly yard. Due to the preliminary nature of SCE's design for helicopter construction of towers within the ANF, it has been conservatively assumed that up to two helicopter support yards would be utilized per helicopter staging/support area (11 staging/support areas x 2 = 22 total).

The following activities can take place at these helicopter support yards:

A. The refueling of the helicopter and necessary light maintenance. A fuel truck and a mechanics truck would be located at these yards.

B. The transportation of personnel, tools, and small equipment by helicopter to and from the yards and construction sites.

C. Temporary parking for a fuel truck, a mechanics truck, and transport vehicles for personnel.

D. To serve as a safe landing area for the helicopter in case of an emergency.

Helicopter Construction Landing Pads (SCE, 2008a)

Helicopter construction landing zones or "pads" are required for those structure sites that are at locations that cannot be accessed by a road. These "pads" are needed to off load personnel, tools, and equipment that are necessary to hand dig the foundations and erect the structure. These "pads" typically require a 40-foot by 40-foot area that should be as level as possible and cleared of vegetation in order to facilitate landing, off loading, and take offs. Ideally, the "pad" would be located in close proximity to the structure site, on the uphill side adjacent to the transverse face. In some areas that have extreme sloping terrains, a portable 25-foot by 25-foot landing pad with adjustable legs could be flown in and placed close to the structure site to be used for helicopter landing, off loading, and take off. Once the project is completed ~~the~~some "pad" areas may remain cleared for transmission line operations and maintenance, while others would be restored ~~or~~and the portable "pad" would be removed. It has been assumed that one landing pad would be required at each tower proposed to be constructed by helicopter (33 total) and that 75 percent would remain permanent features of the Project to support operations and maintenance activities.

The following activities can take place at these helicopter construction landing pads:

A. The transportation of personnel to and from the yards to the structure site; at the beginning of the work day a small helicopter would land on the "pad" and personnel would off load from the helicopter and walk a short distance to the structure site, at the end of the work day the helicopter would land on the "pad" to pick up the personnel.

B. The staging area for delivery and pick up of small hand tools and equipment used during construction. On delivery or pick up, the small hand tools and equipment are suspended from the helicopter, lowered to the ground and released or attached to a tether and lifted, the helicopter does not land.

2.2.12.3 Access and Spur Roads

Transmission line roads are classified into two groups: access roads and spur roads. Access roads are through roads that run between tower sites along a ROW and serve as the main transportation route along line ROWs. Spur roads are roads that lead from line access roads and terminate at one or more tower sites.

This Project includes construction on both existing and new ROW. Where construction would take place on existing ROW, it is assumed that most of the existing access roads as well as spur roads would be used. However, it is also assumed that alterations to these roads would be necessary in some locations to accommodate construction activities. This work may include:

- Re-grading and repair of existing access and spur roads to SCE standards and to Forest Service standards within the ANF (as required). These roads would be cleared of vegetation, blade-graded to remove potholes, ruts, and other surface irregularities, and re-compacted to provide a smooth and dense riding surface capable of supporting heavy construction equipment. The graded road would have a minimum drivable

width of 12 feet and preferably a shoulder width of an additional 2 feet. An average 50-foot radius would be required for turns, resulting in additional road width. Refer to Figure 2.2-78 for a typical road cross section.

- Drainage structures such as wet crossings, water bars, overside drains, pipe culverts, and concrete bridges (see Figures 2.2-79 through 2.2-81) would be installed or reconstructed to allow for construction traffic usage and prevent erosion and associated road damage due to uncontrolled water flow.
- Slides, washouts, and other slope failures would be repaired and stabilized by installing retaining walls (see Figure 2.2-82) or other means necessary to prevent future failures. The type of structure to be used would be based on specific site conditions.

Where construction would take place in a new ROW, which is particularly applicable to Segments 4 and 10, new access and spur roads built to SCE standards would be necessary to access the transmission line structure locations. New access and spur roads would be considered permanent features of the Project and would be maintained throughout the life of the Project; however, roads having a grade of 25 percent or more would generally be considered temporary (for construction purposed only) and would be restored (put to bed) upon completion of construction. Once the location of access and spur roads have been selected, biological and cultural resource reviews, as well as a visual resources review for those located on NFS lands, would be conducted prior to final site selection (SCE, 2007b – DR#1: Q072).

Within the ANF (Segments 6 and 11), SCE would use, maintain, or improve a complex network of paved and unpaved roads, both Forest Service (FS) system and non-system roads, as well as primary highways that cross NFS lands but are under the jurisdiction of other transportation agencies. This network is shown in Figure 2.2-83. Roads that require some amount of maintenance or improvement are identified; however, it should be noted that some of the paved access roads identified in Figure 2.2-83 may also require maintenance or improvement, as discussed above. The locations of these improvements~~paved access roads~~ are unknown at this time and would be determined as part of final engineering. The proposed Project would also require the construction of approximately 4.4~~2~~ miles of new (per Forest Service designation) permanent spur roads to facilitate construction and maintenance at various tower locations.

The roads that have been proposed for use, upgrade, or new construction within the ANF have been classified into three categories defined in Forest Service Engineering Manuals: (1) maintenance, (2) reconstruction, and (3) new construction. In this document, the words 'improve' or 'improvement' are used synonymously with reconstruction for roads within the ANF. Details of these categories can be found in Section 3.13, Traffic and Transportation. Table 2.2-41 (located at the end of Chapter 2) provides a list of roads that are expected to be used for the Project. While some of these roads are in suitable condition for vehicular use, many would require extensive maintenance or improvement to accommodate large, heavy equipment during construction of the proposed Project. It is difficult to quantify these requirements; therefore, all unpaved roads within the ANF were assumed to need at least some degree of maintenance. It is anticipated that most of the roads constructed or reconstructed to accommodate new construction would be left in place (permanent) to facilitate future access for operations and maintenance purposes. Special Use authorizations for long term use and maintenance of these roads would be issued after construction is completed. The required gates would be installed ~~to fenced property lines~~ to restrict general and recreational vehicular access to road ROWs. Construction roads across areas that are not required for future operations and maintenance access would be removed and restored after construction is completed. An example of this type of road would be a road constructed to provide access to a splice location during wire-stringing operations. Support facilities such as helicopter assembly yards and pulling/tensionser/ splicing sites may require construction of spur roads to them when they are not accessible from an existing access or spur road.

2.2.12.4 Removal of Existing Wire, Structures, and Footings

Construction of Segments 5 through 8 and Segment 11 would require the removal of existing transmission line. Transmission line equipment to be removed includes existing 220-kV and 66-kV towers and poles and associated hardware (i.e., insulators, vibration dampeners, suspension clamps, ground wire clamps, shackles, links, nuts, bolts, washers, cotters pins, insulator weights, and bond wires), as well as the transmission line primary conductor and ground wire.

SCE proposes to remove the existing 220-kV and 66-kV LSTs through the following activities:

- **Grading:** Existing access routes would be used to reach tower sites, but some rehabilitation work on these routes may be necessary before removal activities begin. In addition, grading may be necessary to establish crane pads for tower removal.
- **Removal Crane:** For each LST, a crane pad of approximately 50 feet by 50 feet would be cleared of vegetation and graded (if the ground is not level) to allow a removal crane to be setup at a distance of 60 feet from the LSTs center line. The crane rail ~~w~~could be located diagonally or longitudinally ~~transversely~~ from the LST structure. ~~locations.~~
- **Footing Removal:** The existing LST footing would be excavated and removed down to a depth of 2 feet. Any footing foundation below 2 feet of depth from the ground surface would remain in place. Holes would be filled and compacted, ~~compressed to 90 percent compaction,~~ and then the area would be smoothed to match surrounding grade.
- **Steel Removal:** To remove the steel, crews would drive a light duty truck to each footing area. No hazards would remain following tower removal.
- **Helicopter Use:** In the event that there are no existing access roads, contractors would hike in to the tower locations. Hiking trails of the minimum width necessary would be cut at ground level to remove dense vegetation to allow for passage. For SCE's proposed Project, SCE has estimated that approximately 17 towers in Segment 6 and 16 towers in Segment 11 (all within the ANF) would be removed~~constructed~~ by helicopter (SCE, 2008i). All other towers are anticipated to be removed~~constructed~~ using road-based construction.

  As illustrated in Figure 2.2-84, approximately one or two small helicopters would be used to transport equipment to tower sites for conductor and associated hardware removal. A large, heavy lift helicopter would be used for removal of the existing 220-kV towers. It is estimated that the small helicopter would generally operate from Monday through Friday for up to 8 hours per day, while the large helicopter would operate approximately 6 to 8 hours per day. The operating area of the helicopters would be limited to helicopter staging areas, material and equipment yards, and positions along the utility corridors that have previously been used for this purpose and/or SCE has determined are safe locations for landing. Additional information regarding helicopter support facilities is provided above under Section 2.2.12.2 (Support and Staging Areas).

SCE provided estimates of the minimum and maximum number of helicopter round trips required for removal (wreck-out) by structure type, as follows (SCE, 2008a; SCE 2008c – DR#5: Q5-14):

- The minimum estimated number of helicopter trips required to wreck out a 220-kV single-circuit tower would be approximately 55 for suspension towers and 64 for dead-end towers, and
- The maximum estimated number of helicopter trips required to wreck out a 220-kV single-circuit tower would be 89 for suspension towers and 105 for dead-end towers.

Based on the above assumptions, and as shown in Table 2.2-42 (located at the end of Chapter 2), it has been estimated that to remove 17 existing 220-kV structures in Segment 6 a minimum of 935 and a maximum of 1,513 helicopter round trips would be required; and to remove 16 existing 220-kV structures in Segment 11 a minimum of approximately 880 and maximum of 1,424 helicopter trips would be required (Note: These

estimates do not include the helicopter trips required to construct the new 500-kV structures. See discussion below in Section 2.2.12.5). It should be noted that the number of trips would vary due to other factors, such as distance, weather, altitude, site conditions, etc. For the large and medium load helicopters, assuming a round trip time of 20 minutes (Basis: Assumes 10 minutes for receiving/transferring loads and 5 minutes in-flight to and from based on a 2 mile average distance at a cruise speed of 24 MPH), it has been estimated that a maximum of six to seven round trips could be completed per full tank of fuel. For the smaller helicopters, utilized generally for personnel transfer, the maximum number of round trips that could be completed per tank of fuel would be approximately nine to ten. There are many factors that could change of the number of round trips that could be completed before refueling would be required, although all would generally reduce the number of trips. For example, to maximize load carrying capacity, the fuel tank may not be fully filled (to reduce operating weight), which would reduce the trips per fueling. Utilizing these assumptions, it is estimated that to complete the 2,937 helicopter round trips (maximum) to remove the 33 existing structures in Segments 6 and 11, would take approximately 490 full tanks of fuel (assumes six round trips per fuel tank).

The types of helicopters used would be based upon the specific need, the weight of the load being transported, and the altitude of the tower location. The various needs would range from light loads (crew/inspector transportation, and conductor stringing) to medium to heavy loads (tool and material delivery/removal, and tower removal/construction activities) (SCE, 2007b – DR#1: Q005). The specific helicopters used would also vary, depending on availability and Project schedule.

Typical helicopters used within the Electrical Utility Industry for construction-related activities include (SCE, 2007b – DR#1: Q005):

- Boeing 234 UT (Max. certified external load of 28,000 lbs.)
- Erickson S-64/Sikorsky S-64F (Max. certified external load of 25,000 lbs.)
- Sikorsky S-64E (Max. certified external load of 20,000 lbs.)
- Boeing 107II (Max. certified external load of 11,500 lbs.)
- Kamov KA 32 (Max. certified external load of 11,000 lbs.)
- Sikorsky S-61S (Max. certified external load of 10,000 lbs.)
- Eurocopter 332 C/L (Max. certified external load of 8,800 lbs.)
- MIL MI 17 (Max. certified external load of 8,600 lbs.)
- Sikorsky S-61L (Max. certified external load of 8,600 lbs.)
- Bell 214B (Max. certified external load of 8,000 lbs.)
- Eurocopter 330J (Max. certified external load of 7,300 lbs.)
- MIL MI 8 (Max. certified external load of 6,600 lbs.)
- Sikorsky S-58T (Max. certified external load of 5,000 lbs.)

~~Listed below are the helicopters currently contained in SCE's fleet (SCE, 2007b – DR#1: Q005):~~

- ~~American Eurocopter EC 135 (passenger only – not yet load rated~~
- ~~American Eurocopter AS 350B3 A Star (Max. certified external load of 2,500 lbs.)~~
- ~~American Eurocopter AS 350B2 A Star (Max. certified external load of 2,500 lbs.)~~
- ~~American Eurocopter AS 350D A Star (Max. certified external load of 1,000 lbs.)~~

- ~~McDonnell Douglas MD-500D (Max. certified external load of 1,000 lbs.)~~

Note: The weight capabilities listed above are generic to types and are based on sea level and 60°F. Weights will vary with changes in elevation, temperature, and task.

SCE proposes to remove the existing 220-kV and 66-kV conductor wire through the following activities:

- **Wire Pulling Locations:** Wire-pulling locations are approximately 200 feet by 200 feet (0.92 acre) in size and would be sited approximately every 15,000 feet along the utility corridor, and at dead-end towers and turning points. Figure 2.2-83 (located at the end of Chapter 2) shows the preliminary wire pulling sites and alternative wire pulling site proposed by SCE. It is anticipated that the same locations for installation of the 500-kV lines would be used for removal of existing lines. Wire-pulling equipment would be placed intermittently along utility corridors.
- **Breakaway Reels:** The old conductor wire would be wound onto "breakaway" reels as it is removed.
- **Pulling Cable**: A 3/8-inch pulling cable would replace the old conductor as it is pulled out, thereby allowing complete control of the conductor during its removal. The 3/8-inch line would then be removed under controlled conditions to minimize ground disturbance, and all wire-pulling equipment would be removed.
- **Guard Poles:** Temporary guard poles or guard structures may be installed at transportation, flood control, utility crossings, and at other locations such as parks or near residences to stop the travel of a conductor should it momentarily drop below a conventional stringing height. If required, temporary netting would be installed to protect some types of under-built infrastructure. Please see detailed discussion of guard structure installation in Section 2.2.12.8, below.
- **Conductor Disposal:** The conductor would be transported to a marshalling yard for recycling purposes.

Waste disposal and recycling activities that would be associated with removal of transmission lines are discussed below in Section 2.2.12.15.

2.2.12.5 Tower and Pole Construction

Site Preparation

When possible, the construction of new LSTs and TSPs would occur on former tower sites. When new pads are necessary, the location of each pad would first be graded and/or cleared to provide a reasonable level and vegetation-free surface for footing construction. Sites would be graded such that water would run toward the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive water flows that could cause damage to the tower footings. The graded area would be compacted to at least 90 percent relative density, and would be capable of supporting heavy vehicular traffic.

An area of approximately 0.001 acre would be required for the single footing needed for each TSP and approximately 0.003 acre would be required to accommodate the four footings needed for each LST.

In mountainous areas, benching, a technique in which a tracked earth-moving vehicle excavates a terraced access to LST excavations in extremely steep and rugged terrain, may be required to provide access for footing construction, assembly, erection, and wire-stringing activities during line construction. It would be used minimally and for two purposes:

- To help ensure the safety of personnel during construction activities
- To control costs in situations where potentially hazardous, manual excavations would be required

Foundations

Drilled concrete piers are typically the choice for structure foundations. New lattice steel towers would be constructed on four drilled pier concrete footings, while each tubular steel pole would be constructed on a single drilled pier concrete footing. The foundation process would start with the auguring of the holes for each tower or pole. The holes would be bored using truck or track-mounted excavators with various diameter augers to match diameter requirements of the foundation sizes. Lattice steel structures typically require fouran excavated holes of 3 to 6 feet in diameter and 15 to 30 feet deep. Tubular steel poles typically require onean excavated hole of up to 10 feet in diameter and 60 feet deep. On average, each foundation for an LST or TSP would project above the ground approximately 3 feet.

Following excavation of the foundation holes, reinforcing steel and stub angles would be installed and the concrete would then be placed. Steel reinforced cages and stub angles would be assembled at laydown yards and delivered to each structure location by flatbed truck. Typical lattice towers would require 15 to 20 cubic yards of concrete delivered to each structure location for tangent structures, 25 to 30 cubic yards for angle towers, and 100 cubic yards for dead-end towers. Typical tubular steel poles would require up to 100 cubic yards of concrete at each structure location.

Concrete would be supplied from existing facilities to the extent feasible; however, if concrete supply facilities do not exist in certain areas, temporary concrete batch plants would be set up to supply concrete during foundation construction activities. For example, in Segments 6 & 11, concrete batch plants would need to be established within the ANF, as the concrete must be delivered within approximately 90 minutes to 2 hours (with use of chemicals to slow the reaction time). Concrete batch plants would require an area of approximately 2 acres each, and in general would be located at staging/support areas (primary/secondary marshalling yards and helicopter staging/support areas) (SCE, 2008l). Final siting of the concrete batch plants would be determined with the input of the helicopter contractor, affected private landowners, and land management agencies, such as the Forest Service. Concrete batch plant equipment would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling concrete additives not in the silos (SCE, 2008l). Dust emissions would be controlled by watering the area and by sealing the silos and transferring the fine particulates pneumatically between the silos and the mixers. The transport of concrete would be accomplished with the coordination of radio equipment flagmen and/or pilot cars to control other traffic on the same roadway. Concrete trucks requiring assistance due to excessive grades or loose soils would be attached to dozers or large rubber tired loaders to assist traction of heavy equipment. Concrete would be hauled to tower sites in standard concrete trucks; each truck with a capacity of approximately 8 to 11 cubic yards of concrete; partial truck loads of concrete would be utilized in situations where access issues would prevent the use of a full truck load of concrete.

Footing work would generally be completed using standard "poured-in-place" augured excavation techniques. At the time of construction, elevations would be established; rebar cages set, spurstub angles and concrete placed, and survey positioning would be verified. Concrete samples would be sampleddrawn at time of pour and tested to verifyensure engineered design strengths were achieved. Typically, on a regular terrain under ideal circumstances, a single footing crew could be expected to excavate, place steel cages and stub angles, and pour in place concrete for one complete LST every 2 days. A foundation set for each LST would include four footings. The single foundation for a TSP can typically be completed in 3 days. A normally specified SCE concrete mix typically takes approximately 28 calendar 20 working days to cure to reach an engineered design

strength as verified by compression testing. ~~This strength is verified by controlled testing of sampled concrete.~~ Once this strength has been achieved, crews would be permitted to commence erection of steel.

Conventional construction techniques would generally be used as described above for new footing installation. In certain cases, equipment and material would be deposited at structure sites using helicopters or by workers on foot, such as at the 33 towers identified for helicopter construction under SCE's proposed Project, and crews may prepare the footings using hand labor assisted by hydraulic or pneumatic equipment, or other methods. Alternatively, a tracked excavator may be required to dig the foundation holes in conjunction with the proposed helicopter construction. As such, the tracked excavator would need to access the structure site via a temporary trail or overland 'drive and crush', neither of which would require any grading; although, some minor brush clearing may be required if the vegetation is too dense to drive across (SCE, 2008j).

Where appropriate, feasible, and/or cost-effective, foundations may also be installed utilizing micropiles. Installation of micropiles would require the drilling of several smaller diameter holes (approximately 7-10, 8-inch holes) for each footing, which ultimately would impact a relatively smaller area than conventional footing installations due to the much smaller volume of excavated material. After drilling all the holes, each hole would be flushed with water or air to remove drill cuttings and loose material. Micropiles would then be installed by placing a rebar in each hole with cement grout injected through grout tubes at the lowest point of each micropile, and the hole filled until viscous grout reaches the top of the casing. The micropiles would then be tied together, to act as a single unit foundation, in a reinforced concrete pile cap approximately 4 to 9 feet tall and 1.5 to 6 feet in diameter. Grout could be brought to each tower site dry and mixed at the site, requiring a much reduced amount of concrete required and associated transportation requirements and limitations (delivery within 90 min. to 2 hours).

Tower and Pole Assembly (Ground-Based Construction)

For ground-based construction of LSTs, the LSTs would be assembled in laydown areas at each site and then erected and bolted to the foundations. Tower assembly would begin with the hauling and stacking bundles of steel at tower location per engineering drawing requirements. This activity requires the use of several tractors with 40-foot floats and an onsite loader. After steel is delivered and stacked, crews would proceed with assembly of leg extensions, body panels, boxed sections and the bridges. The steel work would be completed by a combined erection and torquing crew with a lattice boom or hydraulic crane. The construction crew may opt to install insulators and wire rollers (travelers) at this time. Figure 2.2-85 provides a representation of this construction process. Ground disturbance would generally be limited to the laydown areas, which would typically occupy an area of 200 feet by 200 feet (0.92 acre).

For ground-based construction of TSPs, the steel work would consist of hauling the TSPs in sections to their designated sites using semi-trucks with 40-foot trailers and rough terrain cranes. Due to the size of the TSPs, each pole would require at least two trucks. At the site, the poles would be set on the foundations once the proper cure time for the concrete had been attained. The poles could either be assembled into a complete structure or set one piece at a time by stacking them together. This would depend largely on the terrain and available equipment. Stacking the poles one piece at a time would cause the least amount of ground disturbance. Laydown areas would be established for the assembly process and would generally occupy an area of 200 feet by 200 feet (0.92 acre) at each location.

Tower and Pole Erection

Where road access is available to tower sites, assembled tower sections would be lifted into place with a minimum of 80-ton, all-terrain or rough terrain crane that would move along the ROW (i.e., along access and spur roads) for structure erection purposes.

On Segments 6, 7, and 11 of the TRTP, there would be some structure sites located greater than 50 feet from the nearest road. Therefore, it is anticipated that helicopters may be used for removal of these existing structures and installation of new 500-kV LSTs. In general, the number of towers to be constructed by helicopter and the time required for the construction will depend upon decisions made by land managing agencies, such as the Forest Service, final engineering, the determination of the appropriate construction methods to be used by SCE's contractor, and the construction schedule ultimately prepared by SCE's contractor (SCE, 2007b – DR#1: Q005). For example, SCE has preliminarily estimated that approximately 17 towers in Segment 6 and 16 towers in Segment 11 (all within the ANF) would be constructed by helicopter (additional structures to be constructed by helicopter in Segment 7 have not yet been identified by SCE) (SCE, 2008i). All other towers are anticipated to be constructed using road-based construction.

SCE provided estimates of the minimum and maximum number of helicopter round trips required for construction by structure type, as follows (SCE, 2008a; SCE 2008c – DR#5: Q5-14):

- The minimum estimated number of helicopter trips required to construct a 500-kV single-circuit tower would be approximately 146 for suspension towers and 380 for dead-end towers; and
- The maximum estimated number of helicopter trips required to construct a 500-kV single-circuit tower would be 194 for suspension towers and 480 for dead-end tower.

Based on the above assumptions, and as shown in Table 2.2-42 (located at the end of Chapter 2), it has been estimated that to construct 17 new 500-kV single-circuit towers in Segment 6 a minimum of 2,482 and a maximum of 3,298 helicopter round trips would be required; and to construct 16 new 500-kV single-circuit towers in Segment 11 a minimum of approximately 2,336 and maximum of 3,104 helicopter trips would be required (Note: These estimates do not include the helicopter trips required to wreck-out the existing structures. See above discussion in Section 2.2.12.4, Removal of Existing Wire, Structures, and Footings). It should be noted that the number of trips would vary due to other factors, such as distance, weather, altitude, site conditions, etc. As described above in Section 2.2.12.4, it has been estimated that a maximum of six to seven round trips could be completed per full tank of fuel for the large and medium load helicopters. As such, it is estimated that to complete the 6,402 helicopter round trips (maximum) to construct the 33 new structures in Segments 6 and 11, would take approximately 1,067 full tanks of fuel (assumes six round trips per fuel tank).

Use of helicopters for installation eliminates land disturbance associated with crane pads, structure laydown areas, and the trucks and tractors used for steel delivery to structure sites. Figure 2.2-84 illustrates how helicopters are used to assemble structure components. All construction work in remote work sites would be completed by hand with the assistance of portable compressors, portable hydraulic accumulators, and portable concrete mixers that would be flown into the tower sites. The use of helicopters for the erection of LSTs or TSPs would be in accordance with SCE specifications and would be similar to methods detailed in IEEE 951-1966, Guide to the Assembly and Erection of Metal Transmission Structures, Section 9, Helicopter Methods of Construction. It should be noted, however, that TSPs would generally not be constructed by helicopter, as TSPs for extra-high voltage T/Ls (over 220 kV) are typically too heavy to be transported and erected by helicopter (SCE, 2008a). During helicopter operations, public access to defined areas would be restricted. Temporary road closures, traffic detours, and posted notices and signs would be used to restrict public access

to construction areas. This would be in addition to general public access restrictions to protect public health and safety.

2.2.12.6 Wire Stringing Operations

Wire-stringing includes all activities associated with the installation of conductors onto the LSTs and TSPs. This activity includes the installation of primary conductor and ground wire, vibration dampeners, weights, spacers, and suspension and dead-end hardware assemblies. Insulators and stringing sheaves, such as rollers or travelers, are attached as part of the wire-stringing activity if the work is a part of a reconductoring effort; otherwise they are typically attached during the steel erection process. Wire-stringing activities would be conducted in accordance with SCE specifications, which is similar to the process methods detailed in IEEE Standard 524-1992, Guide to the Installation of Overhead Transmission Line Conductors. A standard wire-stringing plan includes a sequenced program of events starting with determination of wire pulls and wire pull equipment set-up positions. Advanced planning by supervision determines circuit outages, pulling times, and safety protocols needed for ensuring that safe and quick installation of wire is accomplished.

Typically, wire pulls occur every 15,000 feet on flat terrain and every 9,000 feet in mountainous terrain. "Wire pulls" are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected, where possible, based on availability of dead-end LSTs at the ends of each pull, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment setups. In some cases, it may be preferable to select an equipment setup position between two suspension towers. Anchor rods would then be installed to provide dead-ending capability for wire sagging purposes, and also to provide a convenient splicing area. Preliminary stringing (puller/tensioner) and splicing setup areas, specifically within the ANF (Segments 6 and 11), are identified in Figure 2.2-83.

To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, and radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of wire-stringing activities. The detail discussion of Guard structure is in Section 2.2.12.8.

Typically, wire splices occur every 4,500 feet. Splicing is typically performed after the conductor stringing has been completed. Conductor splicing can either be performed on the ground or in the air, depending upon the terrain conditions and the technique used to string and sag the conductor. Typically, the splicing crew would use the designated splice location ~~pulling or tensioning areas and the tower construction~~ areas to stage their equipment and perform the tasks necessary to splice the conductors (SCE, 2007b – DR#1: Q080). If splicing is performed in the air, a crane and/or boom truck would be necessary to raise the crew and equipment to the height of the conductors being spliced.

The following four steps describe the wire installation activities proposed by SCE:

- **Step 1: Sock Line; Threading:** A helicopter would fly a lightweight sock line from tower to tower, which would be threaded through the wire rollers in order to engage a cam-lock device that would secure the pulling sock in the roller. This threading process would continue between all towers through the rollers of a particular set of spans selected for a conductor pull.
- **Step 2: Pulling**: The sock line would be used to pull in the conductor pulling cable. The conductor pulling cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel. A piece of hardware, known as a running board, would be installed to properly feed the conductor into the roller; this device keeps the bundle conductor from wrapping during installation.

- **Step 3: Splicing, Sagging, and Dead-ending:** After the conductor is pulled in, all mid-span splicing would be performed. Once the splicing has been completed, the conductor would be sagged to proper tension and dead-ended to towers.
- **Step 4: Clipping-in, Spacers:** After the conductor is dead-ended, a process called clipping-in is used , which attached the conductors to all tangent towers. Once the process of clipping-in is complete, spacers would be attached between the bundled conductors of each phase to keep uniform separation between each conductor.

As noted above, the threading step of wire installation would require helicopter use. While only one small helicopter is needed, two helicopters may be used to shorten the time for this phase. On average, each helicopter would operate 4 hours per day during stringing operations. The operations area of the small helicopter would be limited to helicopter staging areas such as Fox Field and Rio Hondo Substation, ~~and positions~~ locations along the utility corridor that have previously been used for this purpose, and other approved helicopter landing zones ~~and are considered safe locations for landing~~. Final siting of staging areas for the TRTP would be conducted with the input of the helicopter contractor, and affected private landowners and land management agencies. The size of each staging area would be dependent upon the size and number of towers to be removed and installed. Staging areas would likely change as work progress along the transmission lines.

Helicopter fueling would occur at staging areas or at a local airport, e.g., Fox Field, using the helicopter contractor's fuel truck, and would be supervised by the helicopter fuel service provider. The helicopter and fuel truck would stay overnight at a local airport or at a staging area if adequate security is in place.

2.2.12.7 Pulling and Splicing Locations

The dimensions of the area needed for the stringing setups associated with wire installation are variable and depends upon terrain. On average, pulling and splicing equipment set-up sites require an area of 200 feet by 200 feet (0.92 acre); although, the size may vary quite a bit with terrain. ~~however~~In addition, crews can work from within a slightly smaller area when space is limited. These locations require level areas to allow for maneuvering of the equipment. When possible, pulling and splicing locations would be located on existing level areas and existing roads to minimize the need for grading and cleanup. Preliminary wire setup areas (puller/tensioner/splicing), including proposed and alternates, for SCE's proposed Project within Segments 6 and 11 are identified in Figure 2.2-83.

Each pulling location would include one puller positioned at one end and one tensioner and wire reel stand truck positioned at the other end. Specialized support equipment such as skidders and wire crimping equipment would be strategically positioned to support the operations. The locations for pulling and splicing set-up would be used to remove temporary pulling splices and install permanent splices once the conductor is strung through the rollers located on each tower, and are necessary as the permanent splices that join the conductor together cannot travel through the rollers. For stringing equipment that cannot be positioned at either side of a dead-end transmission tower, field snubs (i.e., anchoring and dead-end hardware) would be temporarily installed to sag conductor wire to the correct tension.

The wire setup areas (puller/tensioner/splicing) associated with the TRTP are anticipated to disturb approximately 319 acres of which approximately 25 acres would be on NFS lands. These disturbances would be temporary and the land would be restored to its previous condition following completion of pulling and splicing activities. Tables 2.2-2 through 2.2-9 (located at the end of Chapter 2) provide estimates of the land disturbance associated with this activity for each segment.

2.2.12.8 Guard Structure Installation

Guard poles or guard structures may be installed at transportation, flood control, and utility crossings. Guard structures may also be installed at other locations such as parks or near residences. These are temporary facilities designed to stop the travel of a conductor should it momentarily drop below a conventional stringing height, and are removed after conductors are installed. If required, temporary netting would be installed to protect some types of under-built infrastructure (see Figures 2.2-86 and 2.2-88). In some cases, guard structures can be specially equipped boom type trucks with heavy outriggers. Typical guard structures are standard wood poles, 60 to 80 feet tall, arranged in such a manner as to arrest the travel of conductor should it momentarily drop below a conventional stringing height (see Figure 2.2-87). Depending on the width of the line being constructed, the number of guard poles installed on either side of a crossing would be between two and four.

Public agencies differ on their policies for guard structures and their preferred methods for public safety. For highway and open channel aqueduct crossings, SCE would work closely with the applicable jurisdiction to secure the necessary permits to string conductor across the applicable infrastructure. Typically for major roadway crossings, one of the following four methods is employed to protect the public:

- Erection of a highway net guard structure system;
- Detour of all traffic off of the highway at the crossing position;
- Implementation of a controlled continuous traffic break while stringing operations are performed; and
- Establishment of special line trucks with extension booms onto the highway deck at strategic positions.

Based on a review of the number of road crossings that would be needed along the currently proposed TRTP transmission routes, SCE has estimated that approximately 900 guard structures (approximately 40 of which would be on NFS lands) would be installed to facilitate TRTP construction. Approximately 25 acres of temporary land disturbance (approximately 6 acres of which would be on NFS lands) would be created by guard pole construction. Tables 2.2-2 through 2.2-9 (located at the end of Chapter 2) provide initial estimated land disturbance that would be associated with guard pole installation for each segment. Please note that these estimates are preliminary as the types of guard structures that would be required for crossings and the number of crossings necessary for each segment would be field verified upon completion of final design.

2.2.12.9 66-kV Subtransmission Underground Construction

Part of Segment 8 consists of short sections of the existing 66-kV subtransmission line that would be converted to underground to accommodate construction of new 500-kV facilities. The location of these sections is described in Section 2.2.9.1. To convert the overhead lines to underground, a backhoe would be used to excavate a trench approximately 20 inches wide by 5 feet deep. This substructure would consist of six concrete encased PVC conduits. Each substructure would contain two subtransmission circuits. Each segment would be equipped with at least two concrete vaults, approximately 10 feet wide by 20 feet long for the purpose of splicing cable segments. An excavator would be used to prepare vault locations. Approximately one month would be necessary to complete the construction activities associated with installation of each underground segment.

2.2.12.10 Substation Construction

Substation construction would include construction of one new substation (Whirlwind Substation), significant upgrades to two substations (Antelope and Vincent Substations) (including substation yard expansions), and

equipment additions to three substations (Gould, Mesa, and Mira Loma Substations). In general, construction efforts would occur in accordance with accepted construction industry standards. Work generally would be scheduled Monday through Friday during daylight hours (7:00 a.m. to 5:00 p.m.). When different hours or days are necessary, SCE would obtain variances, as necessary, from the jurisdiction in which the work would take place. All materials associated with construction efforts would be delivered by truck to the individual substation sites. Delivery activities requiring major street use would be scheduled to occur during off-peak traffic hours.

Construction of new substations and substation expansions would require earthwork activities. Construction sites would first be cleared of vegetation and loose rock and then graded to provide a level surface. Soils generated from the grading activities would be tested to determine if contamination is present before removal for disposal. During grading operations, dust would be controlled by measures outlined in the SWPPP. At the new Whirlwind Substation, water required during construction for activities such as dust control and for a concrete batch plant would be provided via one of three options: (1) from a new water well; (2) extending an existing water supply pipeline, located approximately 12 miles away, to the substation site; or (3) trucking in the water from an existing water supply pipeline (located 12 miles away) (SCE, 2009f). The final source for water to be utilized during construction will be determined as part of final engineering for the Project.

Installation of new equipment and structures at each substation would also require earthwork activity. This earthwork would include the excavations needed to support installation of new foundations and trenches within the existing substation pad. Soil from these excavations would be redistributed on substation property.

Construction debris from activities at each substation site would be placed in appropriate onsite containers and periodically disposed of per applicable regulations. Waste management is addressed in more detail in Section 2.2.12.15. The following sections describe the site-specific construction activities that would be associated with the various substations that are part of the proposed TRTP.

Whirlwind Substation

The Whirlwind Substation would be a new 500/220-kV substation located just west of the TWRA in Kern County. More specifically, the site is near the intersection of 170th Street and Holiday Avenue, as depicted on the Detailed Project Location Map (Figure 2.2-1E). An estimate of land disturbance for the proposed site is shown ~~below~~ in Table 2.2-10 (located at the end of Chapter 2). Refer to Table 2.2-19 (located at the end of Chapter 2) for a detailed description of the specific equipment assumed to be used to construct the Whirlwind Substation.

Grading and Earthwork

The following elements of site preparation would be required for Whirlwind Substation:

- Grade the entire 56-acre substation pad and an additional 26.8 acres for the expansion area (82.8 acres total)
- Grade the cut and fill side slopes to blend the existing terrain with the new pad
- Grade and install the substation access roads
- Grade approximately 3.2 acres for installation of the retention pond and SPCC pond
- Install approximately 6,400 feet of 8-foot-high chain link perimeter fence with barbed wire surrounding the entire substation pad and two 24-foot-wide double drive gates

The proposed grading scheme would establish a high point at the northern end of the substation pad and slope down at a 1.0 to 1.5 percent slope towards the southern end of the pad. This down-slope would result in an

elevation change of between 19 and 28 feet. During the final engineering design, a slope percentage would be selected that results in the least amount of earth movement while meeting the physical requirements of the substation, which would be no greater than 2 percent.

Prior to the start of grading, the entire area to be graded would be stripped of all organic matter and loose rocks. Any waste material encountered would be removed as required by the environmental and geotechnical investigations. Waste collected from these stripping operations would be tested for contamination.

The proposed site would be located partly on previously disturbed and plowed land and partly on native terrain. The average natural slope ranges between 1 and 3 percent across the proposed site. For the purposes of determining environmental impacts, an average 2 inches of ground surface of stripping is anticipated over the entire substation site resulting in an estimated quantity of 15,000 cubic yards of soil mixed with small stones and organic matter that would need to be transported from the site and disposed at an appropriate waste disposal facility.

The grading operations would begin once the surface has been cleared. An estimated 100,000 cubic yards of soil would be cut from higher elevations and relocated to the lower elevations as fill. A portion of the cut soil would be used to form a protective earthen barrier along the upslope boundaries to prevent surface storm water runoff from entering the substation. If excessive cut or fill would result, minor alterations to the site elevation and/or slopes might be needed in an attempt to achieve and overall balance. Should it prove impossible or impractical to balance the earthwork quantities, it would be necessary to either export excess soil or import new fill soil. During grading operations, dust would be controlled by measures outlined in the SWPPP.

Foundation Excavation

Approximately 380 foundations of various sizes would be constructed throughout the substation pad to support equipment and steel structures. The installation of approximately 2,700 feet in total length would be a network of partially buried concrete trenches. Excavations of these foundations and trenches would commence following the completion of grading and other yard improvements, and would continue for several weeks. The estimated total volume of soil that would need to be excavated for foundation and trenches is 2,400 cubic yards, and would be spread on a portion of the substation property.

Drainage

The site drainage would be developed during final engineering design to control surface runoff. Typical drainage improvements would consist of concrete swales, ditches, and culverts. Surface runoff from existing upslope areas would be modified to direct the flow around the substation facility. Surface runoff would be mitigated as needed through the use of earthen berms and energy dissipation devices, such as filter cloths, slope drains, and riprap placed near drain openings. All of these methods are designed to minimize the velocity of surface water runoff and protect the landscape from erosion.

In compliance with the CWA, the site construction activities would be consistent with National Pollutant Discharge Elimination System (NPDES) program requirements, which would include development of a Storm Water Pollution Prevention Plan (SWPPP) for the site before construction commences. This plan would focus on implementation of the Best Management Practices and other actions during construction to protect the quality of waters near the construction site.

Access

The primary facility access would be a new 40 ~~30~~-foot-wide, 800-foot-long asphalt concrete paved road with 5-foot-wide compacted dirt shoulders connecting 170th Street West to a gate located just south ~~north~~ of center ~~in~~on the east perimeter wall.~~fence.~~ A secondary access would be provided by a new 40 ~~20~~-foot-wide, 1,200 ~~440~~-foot-long asphalt concrete paved road with 5-foot-wide compacted dirt shoulders connecting 170th Street West to a gate located north of center on ~~near the south end of~~ the east perimeter wall.~~fence.~~

Paving

Asphalt concrete paving would be applied to the facility access road and to all designated internal driveways over an aggregate base material and a properly compacted sub-grade, as recommended by the results of geotechnical investigation at the site.

Rock Surfacing

The areas within the substation perimeter that were not paved or covered with concrete foundations or trenches would surface with a 4-inch layer of untreated, ¾-inch nominal crushed rock. After all grading and below grade construction has been completed, the rock would be applied to the finished grade surface.

Spill Prevention Control and Countermeasures (SPCC) Plan

A Spill Prevention Control and Countermeasures (SPCC) plan would be required for the Whirlwind Substation. Under U.S. Environmental Protection Agency (EPA) CWA regulations, the owner of a substation facility is required to implement a SPCC plan if the facility meets the following three criteria: 1) the facility is not related to transportation; 2) the ~~oil that contains~~ equipment that contains oils at the facility has an aggregate of at least 1,320 gallons, only considering containers that are 55 gallons or more, or an underground oil storage capacity of at least 42,000 gallons; and 3) there is a reasonable expectation of discharge into or upon navigable waters of the United States or adjoining shorelines. In addition, regulations by the State of California independently require that an SPCC plan be implemented for any facility with an aboveground oil storage capacity of at least 10,000 gallons. The total storage capacity of the oil containing equipment of the interconnection facilities at the Whirlwind Substation exceeds 1,320 gallons; therefore, it would trigger the threshold for the EPA requirement for the SPCC plan. SCE would proceed with the preparation for the Spill Prevention Control and Countermeasures (SPCC) plan in accordance with the state and federal requirements.

Storm Water Pollution Prevention (SWPP) Plan

During construction, measures would be marked to ensure that contaminants are not discharged from the site. The development of a Storm Water Pollution Prevention (SWPP) plan would define certain areas that hazardous materials would be stored; where trash would be placed; where rolling equipment would be parked, fueled and serviced; and construction materials, such as reinforcing bars and structural steel members, would be stored. Erosion control during grading of the unfinished site and during subsequent construction would be in place and monitored as specified by the SWPPP. To capture silt and other materials that might otherwise be carried from the site by rainwater surface runoff, one or more basins would be installed. Site improvements at the Whirlwind Substation would result in impervious areas from all concrete foundations used for equipment and structures, the concrete foundation for the MEER, and asphalt and concrete driveways. Management of drainage from these areas would be addressed in the facility drainage plan.

Perimeter Security

The perimeter of the proposed substation would be enclosed by a pre-cast concrete wall and gates. ~~and fences that would all be fitted with barbed wires.~~ The perimeter wall ~~chain link fence~~ would conform to the requirements for electrical substations by consisting of the minimum height of 8 feet above the adjacent finished grade to the outside of the substation.

Whirlwind Substation Equipment

The following equipment would be installed in the 500-kV switchyard of the proposed new Whirlwind Substation:

500-kV Buses

- Eight 60-foot-high by 90-foot-wide bus dead-end structures and foundations.
- Thirty-six bus dead-end insulator assemblies.
- Eighteen 180-foot segments of 3B-2156 kcmil ACSR bus conductors; total conductor length would be ~~(~~approximately 9,720 feet.~~ of conductor).~~ This type of conductor is a triple bundle with three ACSR conductors, where each 2156 ACSR conductor has a diameter of 1.76 inches.
- Six 500-kV, 0.005 Microfarad (MFD), base mounted, coupling capacitor voltage transformers (CCVTs) and foundations.

500-kV Position 1

Install the following equipment to terminate the new Midway - Whirlwind 500-kV T/L in a double breaker configuration:

- One 133-foot-high by 90-foot-wide line dead-end structure and foundations.
- Two 500-kV, 4000A, 63 kA, circuit breakers and foundations.
- Four sets of 500-kV, 4000A, disconnecting switches with support structures and foundations.
- Three 500-kV, 5500A, .265 MH, 60 Hz, suspension-mounted wave traps on “A”, “B” and “C” phases.
- Three 500-kV, 0.005 MFD, base-mounted, CCVTs and foundations.
- Forty-eight 500-kV, high-strength post insulators and foundations.
- Three tie-downs, each equipped with 3B-2156 kcmil ACSR conductor.
- Three 500-kV, polymer-composite, station-type surge arresters, structures and foundations.
- Three 600-foot segments of 3B-2156 kcmil ACSR conductor; total conductor length would be 5,400 feet.

500-kV Position 2

Install the following equipment to terminate the new Vincent – Whirlwind 500-kV T/L as well as the No. 1AA transformer bank leads in a breaker-and-a-half configuration:

- Three 500-kV, 4000A, 63 kA, circuit breakers and foundations.
- Six sets of 500-kV, 4000A, disconnecting switches with support structures and foundations.
- Three 500-kV, 5500A, .265 MH, 60 Hz, suspension-mounted wave traps on “A”, “B” and “C” phases for position 2S only.
- Three 500-kV, 0.005 MFD, base-mounted, CCVTs and foundations for position 2S only.
- Thirty 500-kV, high-strength post insulators and foundations.
- Two 133-foot-high by 90-foot-wide steel line dead-end structures and foundations.

- Six tie-downs equipped with 3B-2156 kcmil ACSR conductor.
- Six 500-kV, polymer-composite, station-type surge arresters structures and foundations.
- Three 600-foot segments of 3B-2156 kcmil ACSR conductors; total conductor length would be 5,400 feet.

500-kV Position 3

Install the following equipment to terminate the new ~~Antelope~~Vincent – Whirlwind 500-kV T/L in a double-breaker configuration:

- One 133-foot-high by 90-foot-wide line dead-end structure and foundations.
- Two 500-kV, 4000A, 63 kA, circuit breakers and foundations.
- Four sets of 500-kV, 4000A, disconnecting switches with support structures and foundations.
- Three 500-kV, 5500A, .265 MH, 60 Hz, suspension-mounted wave traps on "A," "B," and "C" phases.
- Three 500-kV, 0.005 MFD, base-mounted, CCVTs and foundations.
- Forty-eight 500-kV, high-strength post insulators and foundations.
- Three tie-downs each equipped with 3B-2156 kcmil ACSR conductor.
- Three 500-kV, polymer-composite, station-type surge arresters, structures and foundations.
- Three 600-foot segments of 3B-2156 kcmil ACSR conductors; total conductor length would be approximately 5,400 feet.

500-kV Position 6

Install the following equipment to terminate the new Whirlwind – Windhub500-kV T/L in a double-breaker configuration:

- One 133-foot-high by 90-foot-wide line dead-end structure and foundations.
- Two 500-kV, 4000A, 63 kA, circuit breakers and foundations.
- Four sets of 500-kV, 4000A, disconnecting switches with support structures and foundations.
- Three 500-kV, 5500A, 0.265MH, 60Hz, suspension-mounted wave traps on "A", "B" and "C" phases.
- Three 500-kV, 0.005 MFD, base-mounted, CCVTs and foundations.
- Forty-eight 500-kV, high-strength post insulators and foundations.
- Three tie-downs each equipped with 3B-2156 kcmil ACSR conductor.
- Three 500-kV, polymer-composite, station-type surge arresters, structures and foundations.
- Three 600-foot segments of 3B-2156 kcmil ACSR conductors; total conductor length would be approximately 5,400 feet.

500-kV Shunt Capacitor Banks 1 and 2

- Six 500-kV, 3000A, single-phase, horizontally mounted disconnect switches with support structures and foundations.
- Two 500-kV, 3000A, circuit breakers and foundations.
- Six 500-kV, single-phase, grounding switches with support structures and foundations.
- Two 500-kV, 150 MVAR each, shunt capacitor banks, which would be installed at the west end of both 500-kV operating buses.

500/220-kV 1AA Transformer Bank

Install the following equipment for the new 500/220-kV 1AA transformer bank:

- Four 125-foot-high by 60-foot-wide 500/220-kV AA auto-transformer steel dead-end structures and foundations.
- Two 65-foot-high auto-transformer jack bus dead-end structures with three 50-foot-wide beams.
- Two 240-foot segments of 2B-2156 kcmil ACSR conductor for 500-kV and 220-kV jack buses; total conductor length would be approximately 960 feet.
- Three single-phase 500/220-kV, 373 MVA auto-transformers.
- One spare single-phase 500/220-kV, 373 MVA auto-transformer.
- Three 500-kV, polymer-composite, station-type surge arresters, structures and foundations.
- Three 220-kV, polymer-composite, station-type surge arresters mounted on new transformer banks.
- Three 30-foot-high 500/220-kV auto-transformer firewalls.
- Tertiary Reactors will be installed on a needed basis.

It would be necessary to install the following equipment in the 220-kV switchyard to allow the termination of the new Cottonwind-Whirlwind No. 1 and Cottonwind-Whirlwind No. 2 220-kV T/Ls as well as the installation of two 220-kV, 79.2 MVAR capacitor banks.

220-kV Buses

- Six 45-foot-high by 45-foot-wide bus dead-end structures and foundations.
- Twenty-four bus dead-end insulator assemblies.
- Twelve 165-foot segments of 3B-1590 kcmil ACSR conductor; total conductor length would be approximately 5,940 feet. This type of conductor is a triple bundle with three ACSR conductors, where each 1590 ACSR conductor has a diameter of 1.50 to 1.55 inches.
- Six 220-kV, base-mounted, CCVTs and foundations.

220-kV Position 1

Install the following equipment to terminate the new 1AA transformer low side bank leads and the Cottonwind-Whirlwind No. 1 220-kV T/L in a breaker and a half configuration:

- Two 80-foot-high by 45-foot-wide line dead-end structures.
- Six tie-downs each equipped with 2B-1590 kcmil ACSR conductor.
- Three 220-kV, 3000A, 50 kA, circuit breakers and foundations.
- Six sets of 220-kV, 3000A, disconnecting switches with support structures and foundations; two equipped with grounding attachments.
- Three 220-kV, suspension-mounted, CCVTs for position 1N only.
- Two 220-kV bus support with individual pedestal supports and foundations.
- Three 230-foot segments of 2B-1590 kcmil ACSR conductor; total conductor length would be approximately 1,380 feet.

220-kV Position 2

Install the following equipment to terminate the new Cottonwind-Whirlwind No. 220-kV T/L in a double breaker configuration:

- One 80-foot-high by 45-foot-wide line dead-end structures.
- Three tie-downs each equipped with 2B-1590 kcmil ACSR conductor.
- Two 220-kV, 3000A, 50 kA, circuit breakers and foundations.

- Four sets of 220-kV, 3000A, disconnecting switches with support structures and foundations; two equipped with grounding attachments.
- Three 220-kV, suspension-mounted, CCVTs.
- Twelve 220-kV bus support with individual pedestal supports and foundations.
- Three 230-foot segments of 2B-1590 kcmil ACSR conductor; total conductor length would be approximately 1,380 feet.

220-kV Capacitor Banks 1 and 2

- Four 220-kV, 3000A, disconnecting switches with support structures and foundations.
- Two 220-kV, 3000A, 50kA, circuit breakers and foundations.
- Six 220-kV, TRV, coupling capacitors with individual pedestal supports and foundations.
- Six 220-kV, 3.14mH, current limiting reactors (CLRs) with foundations.
- Two 220-kV, group operated, grounding switches with support structures and foundations.
- Two 220-kV, 79.2 MVAR capacitor banks with foundations.

Antelope Substation

Refer to Table 2.2-20 (located at the end of Chapter 2) for a detailed description of the specific equipment assumed to be used to construct the modifications at the Antelope Substation.

Earthwork Activities

Earthwork activities proposed for the Antelope Substation to accommodate the new SVC and shunt capacitors would include an expansion to the south and east sides of the 500-kV switchyard. Prior to the start of grading, the entire area to be graded would be stripped of all organic matter and loose rocks. Any waste material encountered would be removed as required by the environmental and geotechnical investigations. Waste collected from these stripping operations would be tested for contamination. The grading operations would begin once the surface has been cleared. An estimated 10,000 ~~5,000~~ cubic yards of soil would be cut from the higher elevation and placed as fill over the lower elevation to match the existing 500-kV switchyard elevation. During grading operations, dust would be controlled by measures outlined in the SWPPP.

Foundation Excavation

Approximately 100 foundations of various sizes would be constructed throughout the substation pad to support equipment and steel structures. In addition, a network of partially buried concrete trenches approximately 200 feet in total length would be installed. Excavations of these foundations and trenches would commence following the completion of grading and other yard improvements, and would continue for several weeks. The estimated total volume of soil that would be excavated for foundation and trenches is 1,800 cubic yards, and would be spread on a portion of the substation property.

Drainage

The site drainage would be developed during final engineering design to control surface runoff. Typical drainage improvements would consist of concrete swales, ditches, and culverts. Surface runoff from existing upslope areas would be modified to direct the flow around the substation facility. Surface runoff would be mitigated as needed through the use of earthen berms and energy dissipation devices, such as filter cloths, slope drains, and riprap placed near drain openings. All of these methods are designed to minimize the velocity of surface water runoff and protect the landscape from erosion.

In compliance with the CWA, site construction activities would be consistent with NPDES program requirements, which would include development of an SWPPP for the site before construction commences. The SWPPP would focus on implementation of Best Management Practices and other actions during construction to protect the quality of waters near the construction site.

Access

Once the 500-kV area grading has been completed and properly secured, that portion of the original substation fencing would be removed to allow for vehicular access into the expanded area at designated access points.

A new 30 foot wide asphalt concrete paved driveway connecting Avenue J with the 500-kV switchyard would be constructed approximately 1,200 feet east of the existing Antelope Substation entry. The road would be approximately 360 feet long connecting to a gate in the new perimeter wall.

Rock Surfacing

The areas within the substation perimeter that were not paved or covered with concrete foundations or trenches would be surfaced with a 4-inch layer of untreated, ¾-inch nominal crushed run rock. The rock would be applied to the finished grade surface after all grading and below grade construction has been completed.

Spill Prevention Control and Countermeasures (SPCC) Plan

SCE has an existing SPCC Plan that would be revised as necessary to encompass the new regulated equipment at the Antelope Substation.

Storm Water Pollution Prevention Plan (SWPP)

Measures would be marked to ensure that contaminants are not discharged from the site during construction. The development of a Storm Water Pollution Prevention (SWPP) plan would define certain areas that stored hazardous materials would be stored; where trash would be placed; where rolling equipment would be parked, fueled and serviced; and where construction materials, such as reinforcing bars and structural steel members, would be stored. Erosion control during grading of the unfinished site and during subsequent construction would be in place and monitored as specified by the SWPPP. To capture silt and other materials that might otherwise be carried from the site by rainwater surface runoff, one or more basins would be installed. Site improvements at the Antelope Substation would result in impervious areas from all concrete foundations used for equipment and structures. Management of drainage from these areas would be addressed in the facility drainage plan.

Fencing

A new 8-foot high pre-cast concrete perimeter wall surrounding the entire substation would be constructed (SCE, 2009d). ~~The approximately 2,400 feet of new 8-foot high chain link fence with barbed wire would enclose the outer perimeter of the 500-kV switchyard expansion.~~ One new 20-foot double-drive chain link gate would be located along the northern perimeter for access to the adjacent transmission line areas. After the new ~~fence~~ wall has been installed and security measures are in place, approximately 700 feet of the existing substation fence would be removed.

Antelope Substation Equipment

Work on the No. 1 and No. 2 Shunt Capacitor Banks would include installation of the following equipment at the existing Antelope Substation:

- Six 500-kV, 3000A, single-phase, horizontally mounted disconnect switches with support structures and foundations.
- Two 500-kV, 3000A, circuit breakers and foundations.
- Six 500-kV, single-phase, grounding switches with support structures and foundations.
- Two 500-kV, 150 MVAR each, shunt capacitor banks, which shall be installed at the south end of both 500-kV operating buses.

In addition, the new 500 kV position 8 at the existing Antelope Substation would be equipped with the following equipment for the new SVC:

- Two 500-kV, 3000A, 63kA, circuit breakers and foundations.
- Four sets of 500-kV, 3000A, disconnecting switches with support structures and foundations.
- Forty eight 500-kV, high-strength post insulators and foundations.
- Three 108-foot-high steel dead-end structures and foundations.
- Three tie-downs, each equipped with 2B-2156 kcmil ACSR conductor.
- Three 500-kV, polymer-composite, station type surge arresters.
- Three 600-foot segments of 2B-2156 kcmil ACSR conductor; total conductor length would be approximately 3,600 feet.
- Install new SVC and other associated equipment on the southwest side of the substation.

Vincent Substation

Refer to Table 2.2-21 (located at the end of Chapter 2) for a detailed description of the specific equipment assumed to be used to construct the modifications at the Vincent Substation.

Earthwork Activities

For the Vincent Substation expansion, the proposed 220-kV switchyard expansion would require grading beyond the edge of a sharp drop-off. To significantly limit the quantity of earthwork that would be needed to extend the area, a poured in-place concrete or concrete block retaining wall would be constructed (SCE, 2007b – DR#1: Q083). The wall would measure approximately 150 feet long, and vary in height between 1-foot-high at each end to approximately 13-feet-high near the center. The area between the wall and the existing substation pad would be back-filled with clean fill material that would be brought up to the level of the existing substation pad surface. The backfilled area would require an estimated quantity of 2,000 cubic yards of soil. The final wall design and the actual quantity of required soil would be calculated during the final engineering design.

In addition, the proposed expansion of the 500-kV switchyard would require an area approximately 765 ~~680~~ feet wide by approximately 1,140 ~~1,120~~ feet, ~~including an 880 foot long expansion beyond the existing substation fenced area, and would compromise~~consisting of approximately 20 ~~18~~ acres. A terraced approach would be used to limit the quantity of earthwork in this area, where a portion of the new construction would be on the existing substation pad measuring approximately 700 ~~680~~ feet by 250 feet, comprising approximately 4 acres. ~~, and t~~The remaining portion would be a lower terrace measuring approximately 820 ~~680~~ feet by 860 ~~870~~ feet, comprising approximately 16 ~~14~~ acres, extending to the west. The new terrace would be approximately

20 feet lower in elevation than the existing substation graded pad. This terracing would require a series of three retaining walls and a 2:1 slope. The walls would range in height from 2 to 7 feet (maximum). An estimated 51,000~~72,000~~ cubic yards of soil would be cut from higher elevations and an estimated 27,000 cubic yards relocated to the lower elevations as fill to provide a level pad with a slope between 1 and 2 percent. The remaining soil would be spread throughout the site to minimize export from the site.

A minor re-routing of the existing substation access driveway would be required to accommodate an expansion of the existing substation control house. Additional equipment expansion would occur in a previously graded portion of the northeast corner of the substation property, outside the existing perimeter fence.

Foundation Excavation

Approximately 200 foundations of various sizes would be constructed throughout the substation pad to support equipment and steel structures. In addition, a network of partially buried concrete trenches approximately 4,000 feet in total length would be installed. Excavations of these foundations and trenches would commence following the completion of grading and other yard improvements, and would continue for several weeks. The estimated total volume of soil that would be excavated for foundation and trenches is 4,000 cubic yards, and would be spread on a portion of the substation property.

Drainage

The existing drainage improvements at the 220-kV-area expansion would be removed and re-routed to clear the expansion area, reconnecting to the existing system beyond the new expansion area.

At the new expanded 500-kV switchyard area, the site drainage would be developed during final engineering design to control surface runoff. Typical drainage improvements would consist of concrete swales, ditches, and culverts. Surface runoff from existing upslope areas would be modified to direct the flow around the substation facility. Surface runoff would be mitigated as needed through the use of earthen berms and energy dissipation devices, such as filter cloths, slope drains, and riprap placed near drain openings. All of these methods are designed to minimize the velocity of surface water runoff and protect the landscape from erosion.

In compliance with the CWA, site construction activities would be consistent with NPDES program requirements, which would include development of an SWPPP for the site before construction commences. The SWPPP would focus on implementation of Best Management Practices and other actions during construction to protect the quality of waters near the construction site.

Access

Once the 500-kV area grading has been completed and properly secured, that portion of the original substation fencing would be removed allowing for vehicular access into the expanded area at designated access points. To facilitate access, the existing 16-foot wide by 90-foot long dirt road would be paved. Additionally, a double swing gate would be included in the new fencing that would enclose the expanded 500-kV switchyard. The gate would remain locked during normal operating conditions.

Rock Surfacing

The areas within the substation perimeter that were not paved or covered with concrete foundations or trenches would be surfaced with a 4-inch layer of untreated, ¾-inch nominal crushed run rock. The rock would be applied to the finished grade surface after all grading and below grade construction has been completed.

Spill Prevention Control and Countermeasures (SPCC) Plan

SCE has an existing SPCC Plan that would be revised as necessary to encompass the new regulated equipment for the Vincent Substation.

Storm Water Pollution Prevention Plan (SWPP)

During construction, measures would be in place to ensure that contaminants are not discharged from the site during construction. The development of a Storm Water Pollution Prevention (SWPP) plan would define certain areas where hazardous materials would be stored; where trash would be placed; where rolling equipment would be parked, fueled and serviced; and where construction materials, such as reinforcing bars and structural steel members, would be stored. Erosion control during grading of the unfinished site and during subsequent construction would be in place and monitored as specified by the SWPPP. One or more basins would be installed to capture silt and other materials that might otherwise be carried from the site by rainwater surface runoff. At the Vincent Substation, site improvements would result in impervious areas from all concrete foundations used for equipment and structures, the concrete foundation for the MEER, and asphalt and concrete driveways. Management of drainage from these areas would be addressed in the facility drainage plan.

Fencing

A 140 ~~200~~-foot portion of the existing perimeter fence in the 220-kV area would be removed and replaced by 160 ~~250~~ feet of new fencing located near the top of the new 2:1 slope.~~new retaining wall.~~ No new gates would be located in this area.

New fencing would enclose the 500-kV switchyard expansion. Approximately 2,400 feet of new 8-foot-high chain link fence with barbed wire would enclose the outer perimeter. One new 20-foot double-drive chain link gate would be located along the northern perimeter for access to adjacent transmission line areas. After the new fencing has been installed and security measures are in place, approximately 1,500 feet of the existing substation fence would be removed.

To enclose the new equipment in the substation's northeast corner, the removal of approximately 580 feet of chain link fence and the placing approximately 1,120 feet of required new chain link fence. This new fencing would also incorporate the changes at the substation access driveway which would include a new electrically operated gate.

Vincent Substation Equipment

The 500-kV switchrack in the existing Vincent Substation 500-kV switchyard would need to expand by four line positions with double-breaker or breaker-and-a half arrangement. SCE would:

- Remove serial capacitor bank (SC #3), remain line side dead end only.
- Install two 200 MVAR each capacitor banks at north bus east end and south bus west end
- Install one new 600 MVAR SVC, connected to 500-kV switchrack position 4XN
- Install four circuit breakers at bank position No. 3 and No. 4 to make each position a double-breaker arrangement
- Replace #1AA Bank transformers (total of four single phase transformers)

In addition, the 220-kV switchyard would be upgraded and expanded by performing the following work:

- Expand 220-kV switchrack with one Line Position 2X.

- Relocate the Westwind-Wildness 220-kV T/L termination from position 1XS to 2XN.
- Upgrade Antelope-Vincent No. 1 220-kV T/L and riser conductors from 2B-1033 kcmil ACSR (twin bundle with two ACSR conductors, where each 1033 ACSR conductor has a diameter of 1.21 to 1.24 inches) to 2B-1590 kcmil ACSR (twin bundle with two ACSR conductors, where each 1590 ACSR conductor has a diameter of 1.50 to 1.55 inches).
- Install tie breaker #532 with disconnect switch and T/L dead end at position 3S and terminate the Antelope-Vincent No. 2 220-kV T/L at position 3S. Use 2B-1590 kcmil ACSR conductors.
- Terminate the 500-kV Mesa-Vincent No. 1 500-kV T/L (via Gould) at position 2XS and initially operate at 220-kV.
- Upgrade Rio Hondo-Vincent No. 2 500-kV T/L connection to 500-kV and initialized at 220-kV and remained at Position 6S.

The upgrade of the Vincent Substation would also require a number of additional changes to the 500-kV and 220-kV systems. The new equipment is listed as follows:

500-kV Systems

- 200/266/373 MVA step-down transformer 4 each (1 phase)
- 200 MVAR capacitor bank 2 each
- 600 MVAR SVC with mechanically switched capacitor (MSC) system 1 each
- Bus conductors (3B-2156 kcmil ACSR) 14,100 feet
- 65-foot-high, 90-foot-wide bus dead-end 6 each
- 108-foot-high, 90-foot-wide, 500-kV line dead-end 4 each
- Tie-down bus (3B-2156 kcmil ACSR) 4 set (3 phases)
- 4000A, 63 kA gas circuit breaker 12 each (3 pole)
- 5000A, 80 kA disconnect switch 22 each (3 pole)
- Surge arrester 9 each
- CCVT 9 each
- Power Line Communication (PLC) wave trap 6 each

220-kV Systems

- 40-foot- high by 50-foot-wide bus dead-end 2 each
- Bus and tie down conductors (3B-2156 kcmil ACSR) 2,600 feet
- 90-foot-high, 45-foot-wide, 220 kV line dead-end 3 each
- Tie-down bus 3 set (3 phases)
- 4000A, 80 kA gas circuit breaker 4 each (3 pole)
- 5000A, 80 kA disconnect switch 8 each (3 pole)
- Surge arrester 9 each
- CCVT 9 each
- PLC wave trap To be determined

Other Major Electrical Equipment

The existing station power and lighting, including the substation's emergency generator, would be replaced and relocated within the expanded substation yard. Equipment needed would be as follows:

- Step-down power transformer 12.8 k-120/240 V, 167 kVA 6 each
- Step-down lighting transformer 12.8 k-120/240 V, 167 kVA 2 each
- Emergency generator 250 kW, 3-phase 120/240 V 1 each
- Outdoor AC/DC panels and test outlets 1 set
- PAX (i.e., telecommunications) lines in control house 2 each
- Outdoor PAX (i.e., telecommunications) extensions within the new 500-kV overhead switchyard 2 each
- Cables (AC/DC power, control, instrumentation, alarms, and fiber optic) in trench from 500 kV circuit breakers to the new control house.
- Lights to meet minimum illumination requirement of 0.5-foot candle.

Control House Expansion

The Vincent Substation expansion would include construction of a new 60-foot by 72-foot block wall control house attached to the existing control house. This building expansion would have below grade vault space and tunnel between outdoor cable trench and vault for cable routing. The building would be equipped with dual air conditioning equipment to house lighting and power panels, AC/DC panels, and circuit breaker control switches. In addition, SCE would:

- Upgrade the DC battery system, if required
- Install cable tray systems in the vault space.
- Install 28 each 19-inch relay racks with pre-wired protection devices, indicating meters, Digital Fault Record (DFR), and local and remote alarms.
- Install telecommunication infrastructure.

Gould Substation

To upgrade the Gould Substation, activities would occur within the existing fenced substation yard. Material delivery would use the existing substation access road during daylight hours. The Gould Substation would have approximately 14 foundations of various sizes to be constructed throughout the substation pad to support equipment and steel structures. A network of partially buried concrete trenches approximately 135 feet in total length would be installed. The estimated total volume of soil that would be excavated for the foundations is 100 cubic yards, and would be spread on a portion of the substation property. Refer to Table 2.2-22 (located at the end of Chapter 2) for a detailed description of the specific equipment assumed to be used to construct the modifications at Gould Substation.

Gould Substation Equipment

Within the existing 220-kV switchyard at the Gould Substation, the following work would be performed to terminate the new Eagle Rock – Gould 220-kV T/L:

220-kV East Operating Bus

- Extend existing 220-kV east bus three bays to the south.

- Install one 43-foot-wide by 38-foot-high steel bus dead-end structure and foundations to terminate the new east bus conductors.
- Install three 165-foot segments of 2B-1590 kcmil conductors; total conductor length would be approximately 1,000 feet.
- Extend existing 220-kV east bus control cable trench 135 feet to the south.

220-kV Position 4 (Goodrich 220-kV Line)

The following equipment would be installed at new 220-kV Line Position 4 to terminate the relocated Goodrich 220-kV T/L:

- One, 60-foot-high steel line dead-end structure and foundations.
- Two, 220-kV, 3000A, 63 kA circuit breakers and foundations.
- Four, 220-kV, 3000A, disconnecting switches with support structures and foundations, one equipped with grounding attachments.
- Three, 220-kV suspension-mounted, CCVT.
- One, 220-kV, 3000A, suspension-mounted wave trap on C phase only.
- Three 200-foot segments of 2B-1590 kcmil conductors; total conductor length would be approximately 1,200 feet.

220-kV Position 2 (Eagle Rock – Pardee 220-kV Line)

The existing equipment at existing 220-kV position 2 is rated for 3000A and is adequate for the termination of the new Eagle Rock – Pardee 220-kV T/L. The existing 220-kV wave trap on C phase might have to be removed depending on new protection requirements.

220-kV Position 3 (No. 1A Transformer Bank)

In order to meet current transmission reliability criteria, the following work needs to be performed at existing 220- kV transformer bank No. 1A, position 3:

- Remove six, 220-kV, pedestal-mounted, conductor supports and their structures.
- Remove one, 220-kV, 2000A, group-operated disconnecting switch.
- Install two, 220-kV, 3000A, 63 kA, circuit breakers and foundations.
- Install four, 220-kV, 3000A, disconnecting switches with supports structures and foundations, one equipped with grounding attachments.
- Install three 200-foot segments of 2B-1590 kcmil conductors; total conductor length would be approximately 1,200 feet.
- Replace existing transformer bank high side leads with three 300-foot segments of 1-1590 kcmil conductor; total conductor length would be approximately 900 feet.

220-kV Position 6 (No. 2A Transformer Bank)

In order to meet current transmission reliability criteria, the following work needs to be performed at existing 220- kV transformer bank No. 2A, position 6:

- Remove six, 220-kV, pedestal-mounted, conductor supports and their structures.
- Remove one, 220-kV, 2000A, group-operated disconnecting switch.
- Install two, 220-kV, 3000A, 63 kA, circuit breakers and foundations.

- Install four, 220-kV, 3000A, disconnecting switches with supports structures and foundations, one equipped with grounding attachments.
- Install three 200-foot segments of 2B-1590 kcmil conductor; total conductor length would be approximately 1,200 feet.
- Replace existing transformer bank high side leads with three 300-foot segments of 1-1590 kcmil conductor; total conductor length would be approximately 900 feet.

Mesa Substation

To upgrade the Mesa Substation, activities would occur within the existing fenced substation yard. Material delivery would use the existing substation access road during daylight hours. The Mesa Substation would have approximately 12 new foundations for 220-kV circuit breakers and disconnect switches to be constructed. Along the substation property, the estimated total volume of soil that would be excavated for the foundations is 15 cubic yards. Refer to Table 2.2-23 (located at the end of Chapter 2) for a detailed description of the specific equipment assumed to be used to construct the modifications at the Mesa Substation.

Mesa Substation Equipment

Within the existing 220-kV switchyard at the Mesa Substation, the following work would be performed at existing 220-kV Line Positions 11 and 12 to terminate the new Mesa – Vincent No. 2 220-kV T/L:

220-kV Position 11 (Vincent No. 1 220-kV T/L)

- Install two 220-kV, 3000A, 63 kA circuit breakers and foundations.
- Install four 220-kV, 3000A, horizontal-mounted, disconnecting switches with structures and foundations; one disconnect switch equipped with grounding attachments.
- Install one 220-kV, 3000A, suspension mounted, wave trap.
- Install three 220-kV, suspension-mounted CCVT.
- Install three 220-kV, TRV coupling capacitors.
- Conductor new position with 2B-1590 kcmil ACSR.
- Relocate existing Vincent 220-kV T/L from 220-kV position 12 to position 11.
- Rename existing Vincent 220-kV T/L to Vincent No. 1.

220-kV Position 12 (Vincent No. 2 220-kV T/L)

- Upgrade existing 220-kV position 12 to 4000A.
- Replace two 220-kV, 3000A, 63 kA circuit breakers with two, 220-kV, 4000A, 63 kA circuit breakers.
- Replace four, 220-kV, 3000A, disconnecting switches with four, 220-kV, 4000A, disconnecting switches, one with grounding attachments.
- Replace existing three 200-foot segments of 1-1590 kcmil conductors; new conductor type would be determined during detailed design.
- Remove existing 220-kV, 3000A, suspension-mounted, wave trap.
- Replace existing 220-kV suspension-mounted CCVTs with new 220-kV CCVTs.
- Reconductor existing tie-downs for 4000A capacity.

Mira Loma Substation

To upgrade the Mira Loma Substation, activities would occur within the existing fenced substation yard. Material delivery would use the existing substation access road during daylight hours. The Mira Loma

Substation would have approximately 64 foundations of various sizes to be constructed throughout the substation pad to support equipment and steel structures. No new cable trenches would be required. The estimated total volume of soil that would be excavated for the foundations is 175 cubic yards, and would be spread on a portion of the substation property. Refer to Table 2.2-24 (located at the end of Chapter 2) for a detailed description of the specific equipment assumed to be used to construct the modifications at the Mira Loma Substation.

Mira Loma Substation Equipment

Within the 500-kV switchyard, the following equipment would be installed at existing 500-kV Line Position 2X to terminate the new Mira Loma – Vincent 500-kV T/L:

- Two, 500-kV, 4000A, 63 kA circuit breakers and foundations.
- Four sets, 500-kV, 4000A, disconnecting switches with support structures and foundations; one equipped with grounding attachments.
- Three 500-kV, 5500A, 0.265MH, 60Hz, suspension-mounted wave traps on "A", "B" and "C" phases.
- Three 500-kV, 0.005 MFD, base-mounted, CCVT and foundations.
- Three 444-kV, polymer-composite, station-type surge arresters.
- Thirty 500-kV, high-strength post insulators and foundations.
- Three 600-foot segments of 3B-2156 kcmil conductor; total conductor length would be approximately 5,400 feet.

2.2.12.11 Information Technology Facility Construction

The new OPGW, or optical fiber, is typically installed in continuous segments of 5,000 feet or less, depending upon various factors including line direction, inclination, and accessibility. Following placement of fiber on the OHGW, the strands in each segment are spliced together to form a continuous length from one end of a transmission line to the other. Splices occur near the foot of transmission towers, and may be identified by the metal enclosures of 3 feet by 3 feet by 1 foot, that are mounted on the tower legs some distance above the ground. At a splice tower, the fiber cables are routed down a tower leg and into the bottom of the metal enclosure where the splice case is placed. On the last tower at each end of a transmission line, the overhead fiber is spliced to another section of fiber cable that runs in underground conduit from the tower into the communication room inside the adjacent substation.

Splicing activities are conducted by dedicated crews. Typically, activities are conducted by two crews per segment, with three persons in each crew. Each crew is also accompanied by a foreman. Both crews and foremen use pickup trucks for transport of materials along transmission line segments. All materials are carried in vehicles; therefore, no marshalling yards are needed to support OPGW installation. Crews typically complete four splices per 8-hour work period.

2.2.12.12 Geotechnical Activities

Prior to preparing a final engineering design for the Project, a geological assessment and geotechnical study would be performed to identify site-specific geologic conditions and soil types (SCE, 2007b – DR#1: Q085). Geotechnical test work considered part of TRTP would occur only after the CPUC has certified the Final EIR/EIS (for CEQA compliance) and has approved SCE's Certificate of Public Convenience and Necessity (CPCN) application (Application A.07-06-031) or the Forest Service has issued a Record of Decision (ROD) on the Project. Which approval would be required would depend on whether locations were proposed on NFS

lands or not. In general, these studies would provide a description of the surface and geological conditions, which would influence the final locations and construction methods of the tower footings. Dependent upon T/L length and location, borings would typically occur at least every one~~2 to 5~~ mile~~s~~ in similar conditions and a boring would be performed where conditions change. Where the T/L is in an existing ROW, previous geotechnical reports would be utilized and sample borings would be performed to verify given conditions. Appropriate laboratory tests would be conducted from the soil samples taken from the borings for site specific conditions.

One concern for towers and poles located in mountainous and rough terrain is that they may be subject to slope instability such as slides. Geotechnical engineers would evaluate and analyze specific site and soil conditions to make recommendations for the footing design. Included in this evaluation would be determinations of slope stability and related grading drainage issues. Structure sites that are determined by a geotechnical engineer to be especially susceptible for potential slope failures would usually require stabilization measures.

In general, five stabilization techniques are available when constructing on or near a slope as discussed below (SCE, 2007b – DR#1: Q085):

(1) Avoidance – When there is a potential for landslides, adjustments to tower pad site selection and orientation shall be made to that portion of the T/L route study to avoid known landslides and unstable slope areas.

(2) Deep Foundation System – This option entails constructing a deep foundation system that transfers the loads resulting from the structure to a soil or rock layer beneath the sliding seams or layers. This is to avoid any sliding that could occur due to the additional loading.

(3) Retaining Structure – This method requires building retaining structures to provide support to the base of the slope such as constructing a retaining wall to retain relatively small moving masses.

(4) Reinforcement of the Slope – This can be achieved by soil nailing, micropiles, stone columns with drainage blankets or tiebacks.

(5) Alter the Geometry of the Slope – This requires flattening the slope to reduce the landslide potential by either removing soil from its head or benching the slope or both. This would include excavating and removing unstable material. This method is not always recommended due to the large grading and drainage work involvement.

Final approval of the slope stabilization technique would be obtained from the appropriate regulatory agencies.

Exact locations for slope stabilization activities would be provided prior to the final engineering phase; however, the following portions of the alignment have initially been determined to have higher potential for landslides (SCE, 2007b – DR#1: Q085):

- In Segment 5, along the southern margin of Leona Valley in proximity to the San Andreas fault zone crossing.
- The majority of Segment 6 along and immediately adjacent to the T/L alignment.
- Along and immediately adjacent to the T/L alignment in Segment 7 within the San Gabriel Mountains.
- A substantial portion of Segment 8A in Montebello Hills and major portions of the Puente Hills area.

The geotechnical studies for substations would be conducted prior to grading and analyzed by a professional, licensed Geotechnical Engineer or Geologist to determine the condition of the soil. Borings of sufficient quantity to adequately gather variations in the site soils would be conducted and sample cores removed for

laboratory testing. Soil sample tests typically include the type of soil, moisture content, depth of the water table, engineering properties, resistivity, and contamination. If contaminants are encountered, special studies and remediation measures would be implemented by qualified professionals.

The results of these geotechnical studies would be applied as needed by the various engineering disciplines during the course of the final engineering design.

2.2.12.13 Construction Equipment and Workforce

Construction equipment and workforce needs would vary according to the scope of each segment. Tables 2.2-11 through 2.2-18 (located at the end of Chapter 2) provide estimated equipment and workforce needs for each of the transmission line elements of the proposed TRTP. Estimated equipment and workforce needs for the substation elements of the proposed TRTP are provided in Tables 2.2-19 through 2.2-25 and 2.2-24 (located at the end of Chapter 2), respectively.

2.2.12.14 Land Disturbance During Construction

Land disturbance would be associated with the construction activities that are part of the TRTP. Some disturbance would be temporary in nature, such as disturbance associated with the laydown areas and crane pads associated with tower assembly and erection, and the land would be restored following construction. Other disturbance would be permanent in nature, as the land would remain in a designated use following completion of construction. Examples of permanent disturbance would include tower footings and access roads.

Tables 2.2-2 through 2.2-9 (located at the end of Chapter 2) provide the land disturbance estimates associated with the construction, operations and maintenance of the TRTP. Much of the information in these tables has been taken directly from SCE's Proponents Environmental Assessment (PEA) and may not represent actual field construction methods. The PEA does not disclose the methodologies used to derive these land disturbance numbers, nor does it provide enough supporting data to recreate these numbers. Furthermore, the reporting of different categories of disturbance in each TRTP segment are a result of SCE utilizing different contractors to prepare the various TRTP segments within the PEA, and do not represent differences in planned methods of construction.

The transmission line portion of the proposed Project (not including substation work) would disturb a total of approximately 1,477~~3~~ acres during construction and result in permanent disturbance to a total of approximately 214~~2~~ acres. Earth-disturbing activities would occur along new access and spur roads, and at each foundation installation site. During grading and/or excavation activities, placement of rebar cages, stub angle steel, and placement of concrete, soil and vegetation may be disturbed by both multi-axle auger trucks, multi-axle concrete trucks, and pedestrian activity. In some circumstances, benching of small areas around the tower footing sites may be required. Typically, the ground would be augured to create a hole, rebar cages and stub angle steel would be placed, and concrete would be poured. In exceptionally rugged terrain, footing excavations may be performed entirely by hand using hand-operated power tools.

Assembly of TSPs and LSTs typically would require a laydown area of approximately 200 feet by 200 feet, approximately 0.92 acre. In locations where the terrain in the laydown area is already reasonably level (for example, at an existing tower location), only vegetation removal would occur to prepare the site for construction. In locations where a level surface is not present (for example, a new tower site), both vegetation clearing and grading would be necessary to prepare the laydown area for construction.

Erection of new LSTs may also require establishment of a crane pad to allow an erection crane to set up 60 feet from the centerline of each LST. The crane pad would be located transversely from each applicable LST location. In most cases, this crane pad would be located within the laydown area used for LST assembly. If a separate pad is required, it would occupy an area of approximately 50 feet by 50 feet, approximately 0.06 acre. The pad would be cleared of vegetation and also graded as necessary to provide a level surface for crane operation.

Additional excavations may be required at conductor pulling, tensioning, and splicing locations in order to string conductor safely. Pulling and tensioning activities in particular require level areas to accommodate maneuvering of large equipment. The volume of earth excavated at pulling, tensioning and splicing sites would be determined by final engineering and the successful bidder, but preliminary estimates of disturbance are provided in Section 2.2.12.7 and Tables 2.2-1 through 2.2-8 (located at the end of Chapter 2).

As noted in Section 2.2.12.10 construction of the new Whirlwind Substation would create a new permanent land disturbance associated with establishment of the new substation yard and access roads. Permanent disturbance associated with the new substation ~~yard~~ is estimated to be approximately 97 ~~65~~ acres. ~~(i.e., the substation pad plus side slope grading), while disturbance for the substation's access road would be approximately 1.0 acre.~~

Upgrades to the existing Antelope and Vincent substations would require earthwork activity outside the existing established yard areas to facilitate yard expansions. Total permanent land disturbance associated with expansion of the Antelope Substation is estimated to be 18 ~~12~~ acres; total permanent land disturbance associated with expansion of the Vincent Substation is estimated to be 20 ~~18~~ acres. Equipment additions to the existing Mesa, Gould, and Mira Loma Substations would not require earthwork outside of the existing, fenced substation yard, but some land disturbance would occur as a result from activities such as foundation and trench installation.

2.2.12.15 Hazardous Materials Usage and Waste Generation

Construction of the Project would require limited use of hazardous materials, such as fuel, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the construction phase SWPPP(s) for the T/L segments and substation components.

Construction of the proposed Project would result in the generation of various waste materials. Estimates of waste generation for each transmission line segment are presented in Tables 2.2-26 through 2.2-33 (located at the end of Chapter 2). Estimates of waste generation for substation-related construction activities are presented in Tables 2.2-34 through 2.2-39 (located at the end of Chapter 2). These tables also include an estimation of the Project construction waste that would be reused, recycled, or disposed.

Recyclable or salvageable items would be handled by construction crews processing those materials into roll-off boxes. Salvageable items (i.e., conductor, steel, and hardware) would be received, sorted, and baled, and then sold through available markets. Items to be recycled include 100 percent of the steel from LSTs (i.e., towers, nuts, bolts, and washers), 100 percent of the conductor wire, and 100 percent of the hardware (i.e., shackles, clevises, yoke plates, links, or other connectors used to support conductor). Sanitation waste (i.e., human-generated waste) would be recycled according to sanitation waste management practices.

For waste materials that cannot be reused or recycled, the following waste management facilities are located in the vicinity of the Project, and may be used for the disposal of construction waste:

- **Hazardous waste:** Clean Harbors Buttonwillow, Clean Harbors Los Angeles
- **Non-hazardous waste:** Filter Recycling, TPS Technologies, Crosby and Overton, Demenno Kerdoon
- **Non-regulated municipal type waste:** Chiquita Canyon Landfill, Sunshine Canyon Landfill, Simi Valley Landfill, Lopez Canyon Landfill, Bradley Landfill

During operations, all hazardous materials at the substations would be stored, handled, and used in accordance with applicable regulations, including the construction phase SWPPP(s) and applicable SPCC(s) for the substation components (SCE, 2007b – DR#1: Q089). Vegetation around transmission structures would be trimmed and removed by work crews; ANF-approved ~~no~~ herbicides may~~would~~ be used on the ANF and (with approval) on Corps lands, although use would be restricted to primarily roadsides, helicopter staging areas, and under transmission towers. ~~(SCE, 2007b – DR#1: Q089).~~ANF-approved herbicides include: Chorsulfuron, Clopyralid, Dicamba, Glyphosate (Accord, Rodeo, Roundup, Roundup Pro), Imazapyr (Arsenal, Chopper, Stalker), Picloram, and Triclopyr (Garlon 3A, Garlon 4). SCE would utilize these same herbicides, in consultation with the respective landowner, to control vegetation around transmission structures in other project areas.

2.2.12.16 Construction Schedule

Construction activities for the transmission segments of the proposed TRTP are scheduled to begin concurrently in ~~July~~December 2009. For segments that include line removal, construction would begin with removal of existing lines and then proceed to construction of new lines. Construction activities for the substation facilities included in Segment 9 are scheduled to begin in February 2010. Total length of the construction schedule is currently estimated at approximately ~~1,210 days, or about 55~~ 59 months. The initial Project schedule is provided in Table 2.2-43 located at the end of Chapter 2.

2.2.13 Operations and Maintenance

Once all elements of the Project are constructed, SCE would operate and maintain all of the components of the Project in accordance with existing SCE procedures and terms and conditions of authorizations. No additional personnel would be required during operations of the new T/L and substation facilities (SCE, 2007b – DR#1: Q006). The Whirlwind Substation would be un-staffed, and there would be no change in staffing for the existing Antelope, Vincent, Mesa and Mira Loma Substations (SCE, 2007b – DR#1: Q006). Installation of telecommunications infrastructure would also not change staffing requirements, as all telecommunications equipment would be operated and maintained by existing SCE technicians (SCE, 2007b – DR#1: Q006).

Operations and maintenance of the 500-kV and 220-kV T/Ls would involve periodic inspection approximately once per year via helicopter, ~~and/or~~ truck, and/or on foot (to access more remote locations), as required by current SCE Transmission Operations and Maintenance Policies and Procedures (TOM). As noted in SCE's TOM, aerial inspection of overhead transmission lines can be used to enhance the assessment of spacers, conductors and insulators, etc.; however, these inspections do not permit detailed analysis of other components such as foundations, anchors, etc., and therefore cannot be used exclusively to satisfy routine patrol requirements (SCE, 2008m). As such, aerial inspections may be substituted for ground inspection only on alternate years (SCE, 2008m). These policies and procedures are in accordance with the maintenance practices SCE filed with the California Independent System Operator (CAISO), which require that transmission lines be patrolled annually, with more intrusive inspections being performed under abnormal conditions (SCE, 2008n). Routine inspections are inspections that assess the general condition of the transmission facility and are normally conducted by ground patrols, which may be done from a truck, on foot, or by other means. Helicopters are used occasionally for routine work; however, they are primarily used for emergency patrols or

infrared scanning. Emergency patrols are performed to ensure that the transmission facilities do not present a danger to the general public and are not intended to take the place of a routine patrol. Detailed (climbing) inspections, such as checking LSTs for loose steel or worn hardware, are performed on an as-needed basis.

Recurring maintenance identified in the inspection process would include vegetation management, invasive plant survey and control, wood pole management, insulator washing, insulator replacement, repair of ground wires, tighten/repair of hardware, tighten/replacement of guy wires, and adjustments to switch mechanisms (SCE, 2008n). Vegetation management includes pruning and removal of trees, where only those trees that require trimming before the next planned trim cycle would be pruned. Pruning shall achieve clearance requirements plus one year's growth at time of trimming. Tree removal is the preferred method of vegetation management; however, consideration is given with respect to growth rates, species, environmental and regulatory constraints, property owner approval, and budgetary allowances. Vegetation clearances shall comply with regulations included in GO-95 Rule 35 and related appendices and the required clearances specified in the California Public Resources Code, Section 4292. Within the ANF it is assumed an approximately 20-foot radius from each tower footprint would be kept clear of vegetation. Herbicides, nationally approved by the Forest Service, would be used within the ANF within and along areas of Project disturbance (access/spur roads, laydown and assembly areas, helicopter landing sites, etc.) for control of invasive species, subject to all applicable laws and regulations. ANF-approved herbicides include: Chorsulfuron, Clopyralid, Dicamba, Glyphosate (Accord, Rodeo, Roundup, Roundup Pro), Imazapyr (Arsenal, Chopper, Stalker), Picloram, and Triclopyr (Garlon 3A, Garlon 4). The nature and extent of invasive species control would be further defined in an Operations and Maintenance Plan included in the Special Use authorization issued by the Forest Service. SCE would utilize these same herbicides, in consultation with the respective landowner such as the Corps, to control vegetation around transmission structures in other project areas. Wood pole management includes a structural assessment, which includes a visual inspection of all poles and an intrusive inspection on poles more than 20 years old. Chemical treatment of poles is used when appropriate. Insulator washing is to be performed as dictated by local environmental conditions and operating experience. Lines or line sections that have a history of insulator contamination and flashovers due to insulator contamination would be candidates for insulator washing. Insulator replacement would occur as the need is identified during the inspection process and would be scheduled when resources are available and clearances have been given by the CAISO. When a ground wire problem is identified during an inspection, it would be recorded and scheduled for repair. Similarly, loose or worn hardware, guy wires, and switch mechanisms discovered during an inspection would be recorded and scheduled for repair or repaired during the inspection.

Maintenance of Project facilities would generally be performed on an as-needed basis, including maintenance of the access roads to the final widths that would result from the construction of the Project (final widths are expected to range from 12 to 16 feet), and maintenance of erosion/drainage control structures (SCE, 2007b – DR#1: Q006). Existing road permits within the ANF would be amended or updated to address long term access needs following project construction. Preventative maintenance of telecommunications equipment would be scheduled approximately every six months to ensure system reliability and performance (SCE, 2007b – DR#1: Q006). General operations and maintenance activities within the ANF would occur according to the terms and conditions of the Special Use authorization to be issued by the Forest Service for the Project (see Section 2.6.4 below); however more extensive maintenance determined by an authorized officer to be outside the scope of approved operation and maintenance plans would require additional approvals/permits from the Forest Service. This level of maintenance may include but is not limited to: drainage repairs, replacement of tower components, or additional slope stabilizations measures undertaken after construction. Operation and

maintenance activities on the ANF are expected to change little from what is currently occurring. ~~for example, would require additional approvals/permits from the Forest Service.~~

2.2.14 Alternative 2 – Forest Service Permits and Plan Amendments

Implementation of Alternative 2 would require the issuance of a 50-year term Special Use authorization by the Forest Service. This Special Use authorization would authorize the construction, maintenance, and use of approximately 42.25 miles (21.85 miles in Segment 6 and 20.4 miles in Segment 11) of improvements (500-kV T/Ls along with ancillary improvements) within two existing T/L ROWs on NFS lands within the ANF. Ground disturbing activities or other uses of NFS lands that would occur during construction located outside of the existing ROW width would be included in the Special Use authorization. Additional resource review may be needed prior to issuing this authorization. Furthermore, project-specific ~~several~~ 2005 Forest Plan amendments would be required to (1) modify ~~the~~ Forest Standards S9 and S10 (related to meeting the Scenic Integrity Objectives on NFS lands) ~~along the proposed route through the ANF, (2) modify the Forest Standard related to the Pacific Crest Trail (S1) specifically regarding this Project~~, and (2~~3~~) modify the Riparian Conservation Area Standards for those riparian conservation areas (RCAs) adversely impacted by the Project.

Scenic Integrity Objectives

As mentioned above, it is expected that Project-specific amendment(s) to the 2005 Forest Plan Standards S9 and S10, regarding scenic integrity objectives (SIOs), would be required before the proposed Project could be approved by the Forest Supervisor. Parts 2 and 3 of the Forest Plan provide standards specific for Aesthetic Management (USDA, Forest Service, 2005b and 2005c). These standards include scenic integrity objectives (SIOs) that have been designated for all areas of the Angeles National Forest. At a project level, all national forest activities are subject to review of these scenic integrity objectives.

The following Forest-specific Design Criteria and Place-specific Standards are applicable to the proposed Project:

- ANF S1 - Pacific Crest Trail - Protect scenic integrity of foreground views as well as from designated viewpoints. Where practicable, avoid establishing nonconforming land uses within the viewshed of the trail (Liebre-Sawmill, Santa Clara Canyons, Soledad Front Country and Angeles High Country). (p. 76)
- S9: Design management activities to meet the Scenic Integrity Objectives (SIOs) shown on the Scenic Integrity Objectives Map.
- S10: Scenic Integrity Objectives will be met with the following exceptions: Minor adjustments not-to-exceed a drop of one SIO level is allowable with the Forest Supervisor's approval.
- Temporary drops of more than one SIO level may be made during and immediately following project implementation providing they do not exceed three years in duration.

With regard to visual resources, it is expected that approval of the proposed Project would require Project-specific amendments to the Forest Plan, specifically for Forest Plan (Part 3) Standards 9 and 10. Only with the implementation of these Project-specific Forest Plan amendments would the proposed Project maintain consistency with the Forest Plan with regards to visual resources. No other established visual resource management plans or visual conservation plans have been identified as being in conflict with the proposed Project in the ANF. Visual impacts would occur and compensatory measures would be required through mitigation (see Mitigation Measure V-3b in Section 3.14). For the Project-specific amendment(s) to the 2005 Forest Plan that would be required before the proposed Project could be approved, the SIOs designated in the

Forest Plan would not change; however, the proposed Project would be allowed to be constructed without achieving these SIOs within the Project ROW.

~~amendment(s) to the 2005 Forest Plan that would be required under the proposed Project would include altering SIOs along the Project route. These~~ Forest Plan SIOs were~~are~~ determined by the Forest Service~~,~~ during its planning process in 2005. In establishing SIOs, the Forest Service considered ~~and with~~ public input, ~~and according to~~ visual resource management goals and standards for public lands it administers, ~~including~~ an inventory of inherent scenic attractiveness, viewer concern levels, distance zones, and sensitivity levels. As a result of these planning efforts, the Forest Service ~~has~~ developed statements of Desired Condition and mapped SIOs throughout the ANF. There are five objectives for scenic management (SIOs) ranging from most natural and least disturbed (naturally evolving scenic integrity) to least natural and most disturbed (very low scenic integrity).

~~and, a~~Additionally, there is a sixth level of landscape alteration that is excessive~~,~~ (called unacceptably low scenic integrity) where human-caused deviations are extremely dominant and inappropriate for NFS lands. This sixth level of scenic integrity is never used as a management objective; however, it is useful for inventorying existing visual conditions or for predicting future scenic conditions of proposed projects. ~~such as TRTP.~~ Table 2.2-44 (located at the end of Chapter 2) presents the SIOs utilized to implement Forest visual management goals, with definitions for each.

~~As indicated in~~ Table 2.2-44 displays~~,~~ the 2005 Forest Plan visual management goals. ~~are based on five different SIOs.~~ In accordance with the Forest Plan management direction, SIOs are utilized to evaluate all NFS lands. ~~in the ANF which, for these purposes, is divided into "Landscape Regions". The proposed Project would be situated in the San Gabriel Mountains Landscape Region, including the northern portion of Segment 11 (to the west) and all of Segment 6 (to the east). Existing scenic integrity is defined as the current scenic condition of the landscape considering previous human alterations.~~ Table 2.2-45 (located at the end of Chapter 2) provides the SIOs which are currently assigned to Forest lands that would be traversed by the proposed Project (Segment 11 and Segment 6) in the ANF, presented geographically by Mile Post (MP), from the north to the south.

Construction and operation of the proposed Project would result in conditions that would be inconsistent with the existing SIOs described in Table 2.2-45. Therefore, ~~an~~ Project-specific amendments to the 2005 Forest Plan for Forest Standards S9 and S10 would be necessary in order for the authorized officer to approve the proposed Project. ~~specific to SIOs would be necessary to change SIO levels to be consistent with conditions expected after implementation of the Project.~~ Table 2.2-46 (located at the end of Chapter 2) is organized by Mile Post (MP), from north to south, and provides a description of those locations along Segments 6 and 11 within the ANF where the proposed Project would be inconsistent with Forest Standards S9 and S10. ~~how the existing SIOs would need to be changed in the 2005 Forest Plan for the proposed Project, organized by Mile Post (MP), from north to south.~~

The anticipated SIOs inconsistencies outlined in Table 2.2-46 assume that all relevant mitigation measures recommended for visual resource management in this EIR/EIS would be implemented. If visual resource mitigation measures are not implemented by the decision-makers at the CPUC and/or Forest Service, then the predicted SIO levels in Table 2.2-46 will not be attained, and future scenic integrity would be lower. There are other variables affecting the predicted SIO outcomes. Viewsheds of affected landscapes may be greater than the utility corridor's 1,000-foot width or the ROW width of a few hundred feet. For re-opening, widening,

and/or improvement of existing access roads and spur roads in the ANF, the exact limits of new cuts and fills are not known at this time. New cuts and fills, plus the construction of new roads, which would be approximately 16 feet wide, could alter the predicted SIO changes listed in Table 2.2-46. ~~The SIO changes shown in Table 2.2-46 assume that all relevant mitigation measures recommended for visual resource management in this EIR/EIS will be implemented. If visual resource mitigation measures are not implemented by the decision makers at the Forest Service, then the predicted SIO levels in Table 2.2-46 would not be attained. Viewsheds of affected landscapes may be greater than the Forest Plan's utility corridor width of 1,000 feet.~~ Furthermore, the SIO ~~changes~~ inconsistencies presented in Table 2.2-46 are ~~estimations of~~approximations of what is expected to ~~be required~~occur. ~~; a more definitive analysis of this required 2005 Forest Plan amendment will be prepared once SCE submits a Road Plan for widening and improvement of existing access roads and spur roads in the Forest. The limits of new cuts and fills are unknown at this time. New cuts and fills, plus the construction of new roads that would be approximately 14 feet wide, may alter the predicted SIO changes listed in Table 2.2-46.~~

~~Pacific Crest Trail Standards~~

~~If the Forest Service issues a Special Use authorization for the proposed Project, an amendment to the governing 2005 Forest Plan would be required in order to ensure consistency of actions under the Special Use authorization, as relevant to the Pacific Crest National Scenic Trail (PCT). The 2005 Forest Plan provides standards relevant to the management of aesthetic resources on NFS lands, including designation of Scenic Integrity Objectives (SIO) that have been applied to all NFS lands in the ANF. The following Place-specific Design Standard is specified in the 2005 FLMP and is applicable to the proposed Project, as relevant to the PCT:~~

- ~~***ANF S1 - Pacific Crest Trail - Protect scenic integrity of foreground views as well as from designated viewpoints.*** Where practicable, avoid establishing nonconforming land uses within the viewshed of the trail (Liebre-Sawmill, Santa Clara Canyons, Soledad Front Country and Angeles High Country).~~

~~A temporary drop of more than one SIO level may be made during and immediately following project implementation, providing such a drop does not exceed three years in duration. Construction and operation of the proposed Project would include implementation of new, taller, wider single-circuit 500-kV transmission structures that would adversely impact visual resources by creating strong contrasts of form, line, color, texture and scale, would further degrade existing conditions, and would not meet the Desired Condition (natural-appearing) or the SIO levels specified in the 2005 Forest Plan for the PCT. Therefore, in order for the proposed Project to maintain consistency with the 2005 Forest Plan, an amendment to the Plan would be required because the Project would adversely impact foreground views and would conflict with Forest Standard S1 as related to the PCT. Such an amendment would be applicable for each PCT crossing of the proposed Project that would occur on NFS lands.~~

Riparian Conservation Area Standards

An amendment to the 2005 Forest Plan would be required to resolve impacts to RCAs, which would be adversely affected by implementation of the proposed Project. As defined in Goal 5.2 of the 2005 Forest Plan, RCAs are areas along streams and around water/riparian features that are identified to protect riparian and aquatic ecosystems and the dependent natural resources associated with them during site-specific project planning and implementation. According to the 2005 Forest Plan, RCAs include aquatic and terrestrial ecosystems and lands adjacent to perennial, intermittent, and ephemeral streams, as well as around meadows, lakes, reservoirs, ponds, wetlands, vernal pools, seeps, and springs and other bodies of water. Riparian

dependent resources area those natural resources that owe their existence to the area, such as fish, amphibians, reptiles, fairy shrimp, aquatic invertebrates, plants, birds, mammals, soil, and water quality. As presented in the 2005 Forest Plan, the desired conditions for riparian systems are that watercourses function properly and support healthy populations of native and desired non-native riparian dependent species. Further desired conditions for riparian systems include a minimal, if any, presence of invasive non-native plant and wildlife species and a level of resiliency that allows these systems to recover from natural events, such as floods and wildland fires.

The 2005 Forest Plan requires the Five-Step Process to assist in ensuring that RCAs are recognized, emphasized, and managed appropriately during new project planning and implementation. The Five-Step Process is a screening mechanism that utilizes a variety of components addressed at effective management of RCAs, including: identifying RCA boundaries based on stream type and specific natural resource requirements; weighing the effects of new projects versus the Forest Service riparian and aquatic desired conditions and existing recovery plans for federally listed riparian-dependent species; comparing new projects against current Forest Service riparian management objectives; and applying specific guidelines when conducting activities within RCAs. Step 3 of the Five-Step Process requires the completion of a project-driven land management plan amendment for projects that would not result in neutral effects or move RCAs closer to desired conditions.

A total of 267 RCA locations with potential to be impacted by project activities were identified during field assessments for the proposed Project on NFS lands. These RCAs fall within the transmission line ROW or along access roads that would be used and upgraded during construction of the proposed Project. SCE has indicated that project design features, including structure locations, would be designed to avoid riparian areas. Of the 267 RCA impact locations that occur on NFS lands, 95 would be subject to Project impacts that would be considered adverse, as noted in Table 2.2-47 (located at the end of Chapter 2). ~~The greatest impact to RCAs as a result of implementation of the proposed Project would be due to the construction and/or improvement of new spur roads and existing access roads.~~ In some cases, ~~these~~ road improvements would include the removal of riparian and adjacent upland vegetation to accommodate the widening of roads. These impacts would directly conflict with current Forest Service objectives and desired conditions in that the effects would be neither neutral nor beneficial. As a result, and in compliance with Step 3 of the Five-Step Process, a Forest Plan Amendment would be required prior to any construction activities associated with implementation of the proposed Project for the RCAs identified in Table 2.2-47 and shown in Figure 3.4-6 (located in the Map & Figure Series Volume).

2.3 Alternative 3: West Lancaster Alternative

This alternative was suggested by members of the public prior to the scoping period. It would re-route the new 500-kV T/L in Segment 4 along 115th Street West rather than 110th Street West, as shown in Figure 2.3-1. The West Lancaster Alternative would deviate from the proposed route (Alternative 2) at approximately S4 MP 14.9, where the new 500-kV T/L would turn south down 115th Street West for approximately 2.9 miles and turn east for approximately 0.5 mile, rejoining the proposed route at S4 MP 17.9. This 3.4-mile re-route would increase the overall distance of Segment 4 by approximately 0.4 mile; however, the number of overall structures would decrease by one due to greater spacing between structures compared to the proposed Project (SCE, 2008b: DR#4 – Q4-02).

Alternative 3 would be identical to the proposed Project (Alternative 2) with respect to Segments 5, 6, 7, 8, 10, and 11 as discussed in Sections 2.2.5 through 2.2.9. All substation and information technology facilities

would also be identical to the proposed Project as discussed in Sections 2.2.10 and 2.2.11, respectively. Construction of Alternative 3 would be generally be the same as the proposed Project as discussed in Section 2.2.12; however, there would be a decrease in the land disturbance total by a factor of one structure within Segment 4 (SCE, 2008b: DR#4 – Q4-02). As such, the acres disturbed during construction would continue to be approximately 166 acres, and the acres permanently disturbed would continue to be approximately 20 acres (see Table 2.2-3, Segment 4 – 500 kV). The West Lancaster Alternative would not require additional construction equipment or workforce (SCE, 2008b: DR#4 – Q4-03) compared to Alternative 2 and no additional construction waste is anticipated (SCE, 2008b: DR#4 – Q4-04); therefore the estimates provided in Tables 2.2-13 and 2.2-28, respectively, would remain valid for this alternative.

New access and spur roads would need to be created in the area of the re-routed portion of Alternative 3, similar to the proposed Project Segment 4 route. Ideally, down-line access roads would follow the route within the ROW, and would parallel the route with spur roads going to one or more structure locations when down-line access is not possible. SCE would attempt to use existing roads to the extent possible and would only need to build new access or spur roads where the existing roads do not provide the required access (SCE, 2008b: DR#4 – Q4-02).

Operations and maintenance of Alternative 3, including T/L and substation components, would be identical to the proposed Project as described in Section 2.2.13, above.

Alternative 3 – Forest Service Permits and Plan Amendments

Requirements for Forest Service Permits and Plan Amendments would be identical to those described for Alternative 2 (see Section 2.2.14).

2.4 Alternative 4: Chino Hills Route Alternatives

2.4.1 Chino Hills Route A Alternative

2.4.1.1 Alternative 4A Description

This alternative was suggested by the City of Chino Hills during the scoping period. This represents a refinement on the Chino Hills State Park alternatives considered by SCE in its PEA (RA Eliminated 6, Options 1 and 2). As shown in Figure 2.4-1, Alternative 4A would deviate from the proposed Project beginning about two miles east of State Route 57 (approximately S8A MP 19.2), where the existing Mira Loma – Walnut/Olinda 220-kV double-circuit T/L and the existing un-energized Chino-Mesa T/L (both in the same corridor as that of Segment 8A) separate from one another. At that point, the new Mira Loma-Vincent 500-kV T/L would turn southeast, remaining parallel and south of the existing Mira Loma – Walnut/Olinda 220-kV double-circuit T/L for approximately 6.2 miles, traversing Los Angeles, Orange, and San Bernardino Counties, including approximately 2.3 miles of Chino Hills State Park (CHSP or park) (SCE, 2008b – DR#4: Q4-14). Along this portion of the alignment, approximately 150 feet of additional ROW would be required to accommodate the new 500-kV double-circuit structures. New permanent access and spur roads would be required to access the transmission structures and switching station (described below) constructed as part of this alternative. More specifically, an all-weather (e.g., paved) access road would be required to provide for year-round access to the switching station. Two potential access road routes through CHSP have been considered as part of this alternative, including use of Bane Canyon Road (south from Soquel Canyon Parkway), then west using either (1) Telegraph Canyon Trail or (2) a combination of South Ridge Trail and Telegraph Canyon Trail to the switching station location (see Figure 2.4-1).

At the junction of the existing Mira Loma – Walnut/Olinda 220-kV T/Ls and the existing Mira Loma – Serrano and Rancho Vista – Serrano 500-kV T/Ls, the new Mira Loma-Vincent 500-kV T/L would terminate into a new 500-kV gas-insulated switching station. The existing 500-kV T/Ls would be looped into the new switching station, which would be a minimum of 4 to 5 acres in size, allowing for power to be transferred along the existing 500-kV T/Ls to Mira Loma Substation. For the gas-insulated switching station, the entire system would be enclosed in a sheet metal building, which would require an air conditioning system (SCE, 2008c – DR#5: Q5-07). The building would be approximately 42-feet high and the dead-end structures on either side of the building would be approximately 65-feet high (SCE, 2008c – DR#5: Q5-07). Figure 2.4-1a provides an example of gas-insulated switchgear technology/equipment at SCE's new Rancho Vista Substation located in Rancho Cucamonga, San Bernardino County, California.

Telecommunications facilities would be included as part of the construction and operation of the new 500-kV switching station to support protective relaying, SCADA, voice, and data applications at the switching station. Telecommunications facilities would likely include lightwave (LW) transmission and channel equipment, and could also include microwave (MW) transmission equipment. The construction of telecommunication lines to the new switching station could be accomplished either through installation of fiber optic overhead ground wire on the top of the proposed T/Ls with terminal equipment at the far ends of the lines, by installing fiber optic cable overhead on wooden poles or placing underground in communication ducts, or by creating microwave paths (SCE, 2009a). Power (AC) to the switching station would also be required to operate pumps, fans, compressors, lights, battery chargers, and other equipment (SCE, 2009a). At least two independent sources of power would be required, which would generally be delivered at 12 kV. This would require connections to distribution systems associated with two independent 220-kV transmission substation systems, such as the Olinda and Chino subtransmission systems (SCE, 2009a). To bring the power to the substation, the existing overhead 12-kV lines in the area would be extended to the proposed switching station. An on-site emergency generation may also be provided. Additional details regarding the required communications and power for the new switching station would be determined as part of final engineering.

From the point of deviation (S8A MP 19.2) to the new switching station (6.2 miles), approximately 21 new double-circuit 500-kV structures would be required, of which approximately 8 to 10 structures would be within CHSP (SCE, 2008b – DR#4: Q4-11 and Q4-15). In addition, the re-route work at the new switching station would include replacing one existing single-circuit 220-kV dead-end lattice structure with one single-circuit 220-kV 3-pole steel dead-end structure; the relocation of two existing single-circuit 500-kV dead-end lattice structures; and the installation of two new single-circuit 500-kV dead-end lattice structures outside of the switching station area (SCE, 2008b – DR#4: Q4-15). At the point of deviation (S8A MP 19.2), an existing 220-kV lattice structure would also be replaced with a 220-kV lattice dead-end structure to move the wires out of the way for the new 500-kV wires and structures (SCE, 2008b – DR#4: Q4-15). As a result of this alternative, no upgrades would occur in Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario. Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) and three double-circuit 220-kV structures would no longer be constructed within Segments 8A and 8C. However, per the 2009 California Independent System Operator (CAISO) Transmission Plan, the Chino-Mira Loma No.3 220-kV T/L would need to be upgraded before the summer of 2013 and the Chino-Mira Loma No. 2 and No. 3 220-kV T/Ls would need to be upgraded before the summer of 2018 to prevent violations of reliability criteria (CAISO, 2009). As such, the existing Chino-Mira Loma No. 1 220-kV T/L in Segment 8B (6.8 miles) would be upgraded with approximately 37 new 220-kV double-circuit structures to accommodate the upgrades of Chino – Mira Loma No.1 and No.2 220-kV T/Ls, as proposed under Alternative 2 (SCE's Proposed Project), with the exception that no new ROW would be required along

Segment 8B. With these upgrades, the Chino-Mira Loma No. 3 220-kV T/L would in effect also be upgraded, as the existing double-circuit structures that currently carry two circuits (Chino – Mira Loma No. 2 and No. 3 220-kV T/Ls) would now be utilized for a single circuit, thereby increasing the available capacity for this line. The upgraded Chino-Mira Loma No. 1 and 2 in Segment 8B would be tied in with the existing Chino-Mira Loma No. 3 220-kV T/L at the Mira Loma Substation. ~~Upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220-kV T/Ls in Segments 8B (6.8 miles) and 8C (built with Segment 8A) would also not occur (SCE, 2008b – DR#4: Q4-13). Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) and approximately 40 double-circuit 220-kV structures (associated with the re-build of Chino-Mira Loma No. 3) would no longer be constructed within Segment 8 (SCE, 2008b – DR#4: Q4-12).~~

2.4.1.2 Alternative 4A Construction

As described above, Alternative 4A would have no upgrades within Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario; however, upgrades would occur in Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario. ~~or within Segments 8B and 8C (Chino-Mira Loma No. 1, 2, and 3 220-kV T/Ls); however,~~ In addition, new structures and permanent spur roads would be required to connect the new double-circuit 500-kV T/L to the new switching station to be located within CHSP and to loop the existing 500-kV T/Ls into the new switching station. Construction of Alternative 4A would be conducted as described in Section 2.2.12 for the proposed Project, with the exception of the switching station, which is a new element associated with Alternative 4A, and Mira Loma Substation, which would not be upgraded as part of this alternative as the new switching station would in effect connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation.

2.4.1.2.1 Construction Equipment and Workforce

Construction equipment and workforce needs for Alternative 4A would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-11 through 2.2-17 (located at the end of Chapter 2); however additional equipment and workforce would be required for Segment 8, specifically for constructing the switching station. Table 2.4-1 and Table 2.4-1a (located at the end of Chapter 2) provide~~s~~ an estimate of the equipment and workforce associated with Segment 8A for Alternative 4A and Segment 8B for all the Alternative 4 routes, respectively. The estimated equipment and workforce needs for the substation elements for Alternative 4A, with the exception of Mira Loma Substation, would be identical to the proposed Project and are provided in Tables 2.2-19 through 2.2-23 (located at the end of Chapter 2). It is assumed that no work would be required at Mira Loma Substation as a result of Alternative 4A, as this alternative would in effect connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation at the new switching station.

2.4.1.2.2 Land Disturbance

Land disturbance associated with Alternative 4A would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-2 through 2.2-8 (located at the end of Chapter 2); however the surface land disturbance within Segment 8 would differ as a result of the new switching station, new permanent access and spur roads, and the need for fewer structures due to the reroute through CHSP. As noted above, no upgrades would occur in Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario; however, upgrades would occur in Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario. ~~Upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220-kV T/Ls in Segments 8B and 8C would also not occur (SCE,~~

~~2008b – DR#4: Q4-13).~~ Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) ~~and approximately 40 double circuit 220 kV structures (associated with the re-build of Chino Mira Loma No. 3)~~ would be eliminated from Segment 8 thereby reducing the land disturbance associated with Alternative 4A (SCE, 2008b – DR#4: Q4-12).

New land disturbance would occur as a result of new T/L structures being installed from the point of deviation (S8A MP 19.2) to the new switching station within CHSP and to loop the existing 500-kV T/Ls into the switching station. As noted above, this would amount to approximately 21 new double-circuit 500-kV structures, 4 new single-circuit 500-kV dead-end structures, and 2 new 220-kV structures (SCE, 2008b – DR#4: Q4-15). New land disturbance would also result from the addition of new permanent access and spur roads.

Construction of the gas-insulated switching station would require substantial cut and fill as the area identified for the switching station consists mostly of steep hilly terrain. Grading would be completed, assuming that a balanced fill and cut would be achieved, to avoid the importing or exporting of soil (SCE, 2008b – DR#4: Q4-06). The cut soil would be removed from the high side slopes and placed on the lower slopes until a level pad has been built. The exception would be the removal from the site of approximately 8,000 cubic yards of waste consisting of soil mixed with organic material and rocks, which cannot be reused within the graded area and would need to be exported to an approved dump site (SCE, 2008b – DR#4: Q4-06). Whether a cut and fill balance can be achieved at the switching station location cannot be assured without the completion of final engineering; should the engineering data prove so, some importing or exporting of soil may be necessary. The total footprint of the switching station site, including the enclosed switching station, safety buffers and side slope allowances for transition from existing terrain to the proposed graded pad would measure approximately 580 feet by 750 feet and contain approximately 10 acres of disturbed land (SCE, 2008b – DR#4: Q4-06).

Table 2.4-2 (located at the end of Chapter 2) provides an estimate of the surface land disturbance associated with Segments 8A and 8B for Alternative 4A. The estimated land disturbance associated with substation construction would be identical to the proposed Project for Alternative 4A as described in Section 2.2.12.14 above and provided in Table 2.2-10, with the exception of the Mira Loma Substation, which would not require upgrades as a result of this alternative.

2.4.1.2.3 Hazardous Materials Usage and Waste Generation

As discussed in Section 2.2.12.15 for the proposed Project, construction of the Project would require limited use of hazardous materials, such as fuel, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the construction phase SWPPP(s) for the T/L segments and substation components.

Waste generated as part of Alternative 4A would be identical to the proposed Project, as provided in Tables 2.2-26 to 2.2-32 (located at the end of Chapter 2), with the exception of Segment 8 where Alternative 4A deviates from the proposed Project both in its routing (traverses CHSP) and overall components, including requiring a new switching station and no upgrades to Mira Loma Substation. As discussed above, construction of the new switching station would require exporting to an approved dump site approximately 8,000 cubic yards of waste consisting of soil mixed with organic material and rocks, which cannot be reused within the graded area (SCE, 2008b – DR#4: Q4-06).

Table 2.4-3 and Table 2.4-3a (located at the end of Chapter 2) provide~~s~~ an estimate of the construction waste associated with Segment 8A for Alternative 4A, including the new switching station, and Segment 8B for all

the Alternative 4 routes, respectively. The estimated construction waste for the substation elements for Alternative 4A, with the exception of Mira Loma Substation, would be identical to the proposed Project and are provided in Tables 2.2-34 through 2.2-38 (located at the end of Chapter 2). It is assumed that no work would be required at Mira Loma Substation as a result of Alternative 4A, as this alternative would connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation at the new switching station.

2.4.1.2.4 Construction Schedule

Construction of Alternative 4A would be identical to the proposed Project, as shown in Table 2.2-43 (located at the end of Chapter 2), with the exception of Segment 8, where fewer T/L structures would be necessary and a new switching station would be required. Construction of the re-routed T/L portion of Segment 8 (beginning at S8A MP 19.2), including modification of existing T/Ls to tie into the new switching station, would take approximately 6.5 months to complete (SCE, 2008b – Rev 0, Jul 21, 2008 schedule). Construction of the new switching station would take approximately one year to complete; however, depending on the civil improvements required, approximately two years would be required for engineering, procurement, and construction (SCE, 2008b – DR#4 Q4-07). It is assumed that this schedule would be accommodated within the ~~36~~ 47 months currently allotted for Segment 8 as shown in Table 2.2-43 (located at the end of Chapter 2); however, this does not account for potential delays resulting from the need to obtain approval from the California State Park Commission to amend the Chino Hills State Park General Plan (see Section 3.9, Land Use).

2.4.1.3 Alternative 4A Operations and Maintenance

Operations and maintenance of the T/Ls and substations under Alternative 4A would be the same as the proposed Project, as described in Section 2.2.13 above. SCE would operate and maintain all of the components of the Project in accordance with existing SCE procedures. No additional personnel would be required for operations of the new T/L, substation, switching station, and telecommunications infrastructure (SCE, 2007b – DR#1: Q006). Operations and maintenance of the 500-kV and 220-kV T/Ls would involve periodic inspection approximately once per year via helicopter and/or truck. Maintenance would be performed on an as-needed basis, including maintenance of the access roads to the final widths that would result from the construction of the Project (final widths are expected to range from 12 to 16 feet), and maintenance of erosion/drainage control structures (SCE, 2007b – DR#1: Q006). Preventative maintenance of telecommunications equipment would be scheduled approximately every six months to ensure system reliability and performance (SCE, 2007b – DR#1: Q006). General maintenance activities within the ANF would be the same as described for Alternative 2 (see Section 2.2.13).

2.4.1.4 Alternative 4A – Forest Service Permits and Plan Amendments

Requirements for Forest Service Permits and Plan Amendments would be identical to those described for Alternative 2 (see Section 2.2.14).

2.4.2 Chino Hills Route B Alternative

2.4.2.1 Alternative 4B Description

This alternative was suggested by the City of Chino Hills. This represents a refinement to the Chino Hills Route A Alternative. As shown in Figure 2.4-2, Alternative 4B would deviate from the proposed Project

beginning about two miles east of State Route 57 (approximately S8A MP 19.2), where the existing Mira Loma – Walnut/Olinda 220-kV double-circuit T/L and the existing un-energized Chino-Mesa T/L (both in the same corridor as that of Segment 8A) separate from one another. At that point, the new Mira Loma-Vincent 500-kV T/L would turn southeast, remaining parallel and north of the existing Mira Loma – Walnut/Olinda 220-kV double-circuit T/L for approximately 4.2 miles, traversing Los Angeles, Orange, and San Bernardino Counties. The alternative route would then enter CHSP, continuing to parallel the existing 220-kV double-circuit T/L for approximately 4.9 miles, at which point the new Mira Loma-Vincent 500-kV T/L would exit the east side of CHSP. The new T/L would continue parallel to the existing 220-kV double-circuit T/L for another approximately 0.6 mile outside of CHSP before turning south, crossing the existing T/Ls, to terminate at a new 500-kV gas-insulated switching station located just south of the existing 500-kV T/Ls. Approximately 150 feet of additional ROW would be required to accommodate the new 500-kV double-circuit structures along the 9.7-mile re-route associated with this alternative (SCE, 2008b – DR#4: Q4-24). New permanent access and spur roads would be required to access the transmission structures and switching station constructed as part of this alternative. An all-weather (e.g., paved) access road would be required to provide for year-round access to the switching station, which would be access off of Butterfield Ranch Road (see Figure 2.4-2).

The existing 500-kV T/Ls located in this area would be looped into the new switching station, which would be a minimum of 4 to 5 acres in size, allowing for power to be transferred along the existing 500-kV T/Ls to Mira Loma Substation. For the gas-insulated switching station, the entire system would be enclosed in a sheet metal building, which would require an air conditioning system (SCE, 2008c). The building would be approximately 42-feet high and the dead-end structures on either side of the building would be approximately 65-feet high (SCE, 2008c). As noted above, Figure 2.4-1a provides an example of gas-insulated switchgear technology/equipment at SCE's new Rancho Vista Substation located in Rancho Cucamonga, San Bernardino County, California.

Telecommunications facilities would be included as part of the construction and operation of the new 500-kV switching station to support protective relaying, SCADA, voice, and data applications at the switching station. Telecommunications facilities would likely include lightwave (LW) transmission and channel equipment, and could also include microwave (MW) transmission equipment. The construction of telecommunication lines to the new switching station could be accomplished either through installation of fiber optic overhead ground wire on the top of the proposed T/Ls with terminal equipment at the far ends of the lines, by installing fiber optic cable overhead on wooden poles or placing underground in communication ducts, or by creating microwave paths (SCE, 2009a). Power (AC) to the switching station would also be required to operate pumps, fans, compressors, lights, battery chargers, and other equipment (SCE, 2009a). At least two independent sources of power would be required, which would generally be delivered at 12 kV. This would require connections to distribution systems associated with two independent 220-kV transmission substation systems, such as the Olinda and Chino subtransmission systems (SCE, 2009a). To bring the power to the substation, the existing overhead 12-kV lines in the area would be extended to the proposed switching station. An on-site emergency generation may also be provided. Additional details regarding the required communications and power for the new switching station would be determined as part of final engineering.

From the point of deviation (S8A MP 19.2) to the new switching station, approximately 37 new double-circuit 500-kV structures would be required, of which approximately 18 to 21 structures would be within CHSP (SCE, 2008b – DR#4: Q4-23 and Q4-25). In addition, the re-route work at the new switching station would include replacing four existing double-circuit 220-kV suspension and dead-end lattice structure with four single-circuit 220-kV 3-pole steel dead-end structures; replacing two existing double-circuit 500-kV suspension lattice structures with dead-end structures; and the installation of two new double-circuit 500-kV dead-end

lattice structures outside of the switching station area (SCE, 2008b – DR#4: Q4-25). At the point of deviation (S8A MP 19.2), an existing 220-kV lattice structure would also be replaced with a 220-kV lattice dead-end structure to move the wires out of the way for the new 500-kV wires and structures (SCE, 2008b – DR#4: Q4-25).

As a result of this alternative, no upgrades would occur in Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario. Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) and three double-circuit 220-kV structures would no longer be constructed within Segments 8A and 8C. However, per the 2009 California Independent System Operator (CAISO) Transmission Plan, the Chino-Mira Loma No.3 220-kV T/L would need to be upgraded before the summer of 2013 and the Chino-Mira Loma No. 2 and No. 3 220-kV T/Ls would need to be upgraded before the summer of 2018 to prevent violations of reliability criteria (CAISO, 2009). As such, the existing Chino-Mira Loma No. 1 220-kV T/L in Segment 8B (6.8 miles) would be upgraded with approximately 37 new 220-kV double-circuit structures to accommodate the upgrades of Chino – Mira Loma No.1 and No.2 220-kV T/Ls, as proposed under Alternative 2 (SCE's Proposed Project), with the exception that no new ROW would be required along Segment 8B. With these upgrades, the Chino-Mira Loma No. 3 220-kV T/L would in effect also be upgraded, as the existing double-circuit structures that currently carry two circuits (Chino – Mira Loma No. 2 and No. 3 220-kV T/Ls) would now be utilized for a single circuit, thereby increasing the available capacity for this line. The upgraded Chino-Mira Loma No. 1 and 2 in Segment 8B would be tied in with the existing Chino-Mira Loma No. 3 220-kV T/L at the Mira Loma Substation. ~~Upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220-kV T/Ls in Segments 8B (6.8 miles) and 8C (built with Segment 8A) would also not occur (SCE, 2008b – DR#4: Q4-13). Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) and approximately 40 double-circuit 220-kV structures (associated with the re-build of Chino-Mira Loma No. 3) would no longer be constructed within Segment 8 (SCE, 2008b – DR#4: Q4-12).~~

2.4.2.2 Alternative 4B Construction

As described above, Alternative 4B would have no upgrades within Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario; however, upgrades would occur in Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario. ~~or within Segments 8B and 8C (Chino-Mira Loma No. 1, 2, and 3 220-kV T/Ls); however,~~ In addition, new structures and permanent spur roads would be required to connect the new double-circuit 500-kV T/L to the new switching station to be located east of CHSP and to loop the existing 500-kV T/Ls into the new switching station. Construction of Alternative 4B would be conducted as described in Section 2.2.12 for the proposed Project, with the exception of the switching station, which is a new element associated with Alternative 4B, and Mira Loma Substation, which would not be upgraded as part of this alternative as the new switching station would in effect connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation.

2.4.2.2.1 Construction Equipment and Workforce

Construction equipment and workforce needs for Alternative 4B would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-11 through 2.2-17 (located at the end of Chapter 2); however additional equipment and workforce would be required for Segment 8, specifically for constructing the switching station. Table 2.4-4 and Table 2.4-1a (located at the end of Chapter 2) provide~~s~~ an estimate of the equipment and workforce associated with Segment 8A for Alternative 4B, and Segment 8B for all the

Alternative 4 routes, respectively. The estimated equipment and workforce needs for the substation elements for Alternative 4B, with the exception of Mira Loma Substation, would be identical to the proposed Project and are provided in Tables 2.2-19 through 2.2-23 (located at the end of Chapter 2). It is assumed that no work would be required at Mira Loma Substation as a result of Alternative 4B, as this alternative would in effect connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation at the new switching station.

2.4.2.2.2 Land Disturbance

Land disturbance associated with Alternative 4B would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-2 through 2.2-8 (located at the end of Chapter 2); however the surface land disturbance within Segment 8 would differ as a result of the new switching station, new permanent access and spur roads, and the need for fewer structures due to the reroute through CHSP. As noted above, no upgrades would occur in Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario; however, upgrades would occur in Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario. ~~Upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220 kV T/Ls in Segments 8B and 8C would also not occur (SCE, 2008b – DR#4: Q4-13).~~ Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) ~~and approximately 40 double-circuit 220-kV structures (associated with the re-build of Chino-Mira Loma No. 3)~~ would be eliminated from Segment 8 thereby reducing the land disturbance associated with Alternative 4A (SCE, 2008b – DR#4: Q4-12).

New land disturbance would occur as a result of new T/L structures being installed from the point of deviation (S8A MP 19.2) to the new switching station east of CHSP and to loop the existing 500-kV T/Ls into the switching station. As noted above, this would amount to approximately 37 new double-circuit 500-kV structures, 4 new double-circuit 500-kV dead-end structures, and 5 new 220-kV structures (SCE, 2008b – DR#4: Q4-25). New land disturbance would also result from the addition of new permanent access and spur roads.

Construction of the gas-insulated switching station would require substantial cut and fill as the area identified for the switching station consists mostly of steep hilly terrain. Grading would be completed, assuming that a balanced fill and cut would be achieved, to avoid the importing or exporting of soil (SCE, 2008b – DR#4: Q4-18). The cut soil would be removed from the high side slopes and placed on the lower slopes until a level pad has been built. The exception would be the removal from the site of approximately 8,000 cubic yards of waste consisting of soil mixed with organic material and rocks, which cannot be reused within the graded area and would need to be exported to an approved dump site (SCE, 2008b – DR#4: Q4-18). Whether a cut and fill balance can be achieved at the switching station location cannot be assured without the completion of final engineering; should the engineering data prove so, some importing or exporting of soil may be necessary. The total footprint of the switching station site, including the enclosed switching station, safety buffers and side slope allowances for transition from existing terrain to the proposed graded pad would measure approximately 580 feet by 750 feet and contain approximately 10 acres of disturbed land (SCE, 2008b – DR#4: Q4-18).

Table 2.4-5 (located at the end of Chapter 2) provides an estimate of the surface land disturbance associated with Segments 8A and 8B for Alternative 4B. The estimated land disturbance associated with substation construction would be identical to the proposed Project for Alternative 4B as described in Section 2.2.12.14 above and provided in Table 2.2-10, with the exception of the Mira Loma Substation, which would not require upgrades as a result of this alternative.

2.4.2.2.3 Hazardous Materials Usage and Waste Generation

As discussed in Section 2.2.12.15 for the proposed Project, construction of the Project would require limited use of hazardous materials, such as fuel, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the construction phase SWPPP(s) for the T/L segments and substation components.

Waste generated as part of Alternative 4B would be identical to the proposed Project, as provided in Tables 2.2-26 to 2.2-32 (located at the end of Chapter 2), with the exception of Segment 8 where Alternative 4B deviates from the proposed Project both in its routing (traverses CHSP) and overall components, including requiring a new switching station and no upgrades to Mira Loma Substation. As discussed above, construction of the new switching station would require exporting to an approved dump site approximately 8,000 cubic yards of waste consisting of soil mixed with organic material and rocks, which cannot be reused within the graded area (SCE, 2008b – DR#4: Q4-18).

Table 2.4-6 and 2.4-3a (located at the end of Chapter 2) provide~~s~~ an estimate of the construction waste associated with Segment 8A for Alternative 4B, including the new switching station, and Segment 8B for all the Alternative 4 routes, respectively. The estimated construction waste for the substation elements for Alternative 4B, with the exception of Mira Loma Substation, would be identical to the proposed Project and are provided in Tables 2.2-34 through 2.2-38 (located at the end of Chapter 2). It is assumed that no work would be required at Mira Loma Substation as a result of Alternative 4B, as this alternative would connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation at the new switching station.

2.4.2.2.4 Construction Schedule

Construction of Alternative 4B would be identical to the proposed Project, as shown in Table 2.2-43 (located at the end of Chapter 2), with the exception of Segment 8, where fewer T/L structures would be necessary and a new switching station would be required. Construction of the re-routed T/L portion of Segment 8 (beginning at S8A MP 19.2), including modification of existing T/Ls to tie into the new switching station, would take approximately 8 months to complete (SCE, 2008b – Rev 0, Jul 23, 2008 schedule). Construction of the new switching station would take approximately one year to complete; however, depending on the civil improvements required, approximately two years would be required for engineering, procurement, and construction (SCE, 2008b – DR#4 Q4-19). It is assumed that this schedule would be accommodated within the ~~36~~ 47 months currently allotted for Segment 8 as shown in Table 2.2-43; however, this does not account for potential delays resulting from the need to obtain approval from the California State Park Commission to amend the Chino Hills State Park General Plan (see Section 3.9, Land Use).

2.4.2.3 Alternative 4B Operations and Maintenance

Operations and maintenance of the T/Ls and substations under Alternative 4B would be the same as the proposed Project, as described in Section 2.2.13 above. SCE would operate and maintain all of the components of the Project in accordance with existing SCE procedures. No additional personnel would be required for operations of the new T/L, substation, switching station, and telecommunications infrastructure (SCE, 2007b – DR#1: Q006). Operations and maintenance of the 500-kV and 220-kV T/Ls would involve periodic inspection approximately once per year via helicopter and/or truck. Maintenance would be performed on an as-needed basis, including maintenance of the access roads to the final widths that would result from the construction of the Project (final widths are expected to range from 12 to 16 feet), and maintenance of

erosion/drainage control structures (SCE, 2007b – DR#1: Q006). Preventative maintenance of telecommunications equipment would be scheduled approximately every six months to ensure system reliability and performance (SCE, 2007b – DR#1: Q006). General maintenance activities within the ANF would be the same as described for Alternative 2 (see Section 2.2.13).

2.4.2.4 Alternative 4B – Forest Service Permits and Plan Amendments

Requirements for Forest Service Permits and Plan Amendments would be identical to those described for Alternative 2 (see Section 2.2.14).

2.4.3 Chino Hills Route C Alternative

2.4.3.1 Alternative 4C Description

Original Alternative 4C (as described in the Draft EIR/EIS)

This alternative was suggested by the City of Chino Hills. This represents a refinement to the Chino Hills Route A Alternative based on discussions between Chino Hills, CHSP, SCE, and the CPUC. The route through CHSP has been modified to circumvent Raptor Ridge, which would minimize potential visual impacts and design complications associated with crossing Raptor Ridge, and would avoid crossing the Raptor Ridge Trail (SCE, 2008c – DR#5: Q5-05). As shown in Figure 2.4-3, Alternative 4C would deviate from the proposed Project beginning about two miles east of State Route 57 (approximately S8A MP 19.2), where the existing Mira Loma – Walnut/Olinda 220-kV double-circuit T/L and the existing un-energized Chino-Mesa T/L (both in the same corridor as that of Segment 8A) separate from one another. At that point, the new Mira Loma-Vincent 500-kV T/L would turn southeast, and remain parallel and south of the existing Mira Loma – Walnut/Olinda 220-kV double-circuit T/L up to the CHSP boundary (approximately 4.2 miles). Along this portion of the alignment, approximately 150 feet of additional ROW would be required to accommodate the new 500-kV double-circuit structures. At this point, the alternative route would turn east along a new approximately 300-foot-wide ROW for approximately 1.5 miles, which would remain just north of the CHSP boundary, to a new 500-kV gas-insulated switching station (SCE, 2008b – DR#4: Q4-34 and Q4-37). Approximately 19 double-circuit 500-kV LSTs would be required for this approximately 5.7-mile re-route to the new switching station (SCE, 2008b – DR#4: Q4-38). In addition, at the point of deviation (S8A MP 19.2), an existing 220-kV lattice structure would be replaced with a 220-kV lattice dead-end structure to move the wires out of the way for the new 500-kV wires and structures (SCE, 2008b – DR#4: Q4-38).

New permanent access and spur roads would be required to access the transmission structures and switching station constructed as part of this alternative. An all-weather (e.g., paved) access road would be required to provide for year-round access to the switching station. Three potential access road routes have been considered as part of this alternative, including: (1) use of Bane Canyon Road (south from Soquel Canyon Parkway), then west using either Telegraph Canyon Trail; or (2) South Ridge Trail, then north to the switching station location; or (3) access via Old Woodview Road (paved city road), then continue west through the Aerojet property (private) following a road called Ferree Street, then head east before turning south to the switching station location (see Figure 2.4-3). Assuming the third option, access to the new switching station would require upgrading of approximately 4.7 miles (25,000 linear feet) of existing asphalt paved road along Old Woodview Road and through the Aerojet property (private), as well as construction of new access roads on the Aerojet property for approximately 0.5 mile to the new switching station site (0.20 mile road to east side of site; 0.34 mile road to west side of site) (SCE, 2009e).

The two existing 500-kV single-circuit T/Ls located within CHSP would be re-routed to allow them to loop into the new switching station, which would be approximately 6.2 acres ~~a minimum of 4 to 5 acres~~ in size and require approximately 32 acres of temporary disturbance, allowing for power to be transferred along the existing 500-kV T/Ls to Mira Loma Substation (SCE, 2009e). For the gas-insulated switching station, the entire system would be enclosed in a sheet metal building, which would require an air conditioning system (SCE, 2008c). The building would be approximately 42 feet high and the dead-end structures on either side of the building would be approximately 65 feet high (SCE, 2008c). As noted above, Figure 2.4-1a provides an example of gas-insulated switchgear technology/equipment at SCE's new Rancho Vista Substation located in Rancho Cucamonga, San Bernardino County, California.

Telecommunications facilities would be included as part of the construction and operation of the new 500-kV switching station to support protective relaying, SCADA, voice, and data applications at the switching station. Telecommunications facilities would likely include lightwave (LW) transmission and channel equipment, and could also include microwave (MW) transmission equipment. The construction of telecommunication lines to the new switching station could be accomplished either through installation of fiber optic overhead ground wire on the top of the proposed T/Ls with terminal equipment at the far ends of the lines, by installing fiber optic cable overhead on wooden poles or placing underground in communication ducts, or by creating microwave paths (SCE, 2009a). Power (AC) to the switching station would also be required to operate pumps, fans, compressors, lights, battery chargers, and other equipment (SCE, 2009a). At least two independent sources of power would be required, which would generally be delivered at 12 kV. This would require connections to distribution systems associated with two independent 220-kV transmission substation systems, such as the Olinda and Chino subtransmission systems (SCE, 2009a). To bring the power to the substation, the existing overhead 12-kV lines in the area would be extended to the proposed switching station. An on-site emergency generation may also be provided. Additional details regarding the required communications and power for the new switching station would be determined as part of final engineering.

Approximately 3.6 miles of new ROW would be required to re-route the existing single-circuit 500-kV T/Ls in and out of the new switching station. The new north-south re-route into the switching station (1.6 miles, of which 1.5 miles is within CHSP) would require an approximately 330-foot wide ROW to accommodate the two 500-kV single-circuit structures. The new east-west re-route beginning at the switching station and proceeding north and east around raptor ridge (2.0 miles, of which 1.6 miles is within CHSP) would require an approximately 480-foot wide ROW to accommodate the two 500-kV single-circuit structures and the re-routed 220-kV double-circuit structures (discussed below) (SCE, 2008b – DR#4: Q4-37). New permanent access and spur roads would be required to access the structures constructed within these new ROWs. To complete the two re-routes of the 500-kV T/Ls (approximately 3.6 miles) would require approximately 30 new single-circuit 500-kV LSTs (approximately 25 within CHSP and 5 outside CHSP) (SCE, 2008b – DR#4: Q4-35 and Q4-38). In addition, approximately 17 LSTs (approximately 13 of which are within CHSP) of the existing single-circuit 500-kV T/Ls would be removed (approximately 2.5 miles) (SCE, 2008b – DR#4: Q4-36 and Q4-38).

A portion of the existing 220-kV T/Ls within CHSP would also be re-routed as part of this alternative. Beginning just west of the CHSP boundary (outside of CHSP), the existing 220-kV double-circuit structures would be re-routed to parallel the new 500-kV double-circuit structures along the northern boundary of CHSP to the new switching station (approximately 1.45 miles). As noted above, the new ROW in this area would be approximately 300-feet wide, to accommodate the 500-kV double-circuit and 220-kV double-circuit structures (SCE, 2008b – DR#4: Q4-37). The 220-kV T/Ls would continue past the switching station, paralleling the re-routed 500-kV T/Ls for approximately 0.36 mile to the boundary of CHSP. At this point, the re-routed 220-

kV and 500-kV T/Ls would enter CHSP for approximately 1.62 miles to reconnect with the existing 220-kV and 500-kV structures. As noted above, the new ROW in this area would be approximately 480-feet wide. To complete the approximately 3.43-mile 220-kV re-route, approximately 17 new double-circuit 220-kV LSTs would be required (approximately 5 to 7 within CHSP) (SCE, 2008b – DR#4: Q4-34 and Q4-38). Approximately 12 existing 220-kV double-circuit LSTs within CHSP and 2 outside CHSP (14 total) would be removed (3.4 miles) (SCE, 2008b – DR#4: Q4-33 and Q4-38).

As a result of this alternative, no upgrades would occur in Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario. Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) and three double-circuit 220-kV structures would no longer be constructed within Segments 8A and 8C. However, per the 2009 California Independent System Operator (CAISO) Transmission Plan, the Chino-Mira Loma No.3 220-kV T/L would need to be upgraded before the summer of 2013 and the Chino-Mira Loma No. 2 and No. 3 220-kV T/Ls would need to be upgraded before the summer of 2018 to prevent violations of reliability criteria (CAISO, 2009). As such, the existing Chino-Mira Loma No. 1 220-kV T/L in Segment 8B (6.8 miles) would be upgraded with approximately 37 new 220-kV double-circuit structures to accommodate the upgrades of Chino – Mira Loma No.1 and No.2 220-kV T/Ls, as proposed under Alternative 2 (SCE's Proposed Project), with the exception that no new ROW would be required along Segment 8B. With these upgrades, the Chino-Mira Loma No. 3 220-kV T/L would in effect also be upgraded, as the existing double-circuit structures that currently carry two circuits (Chino – Mira Loma No. 2 and No. 3 220-kV T/Ls) would now be utilized for a single circuit, thereby increasing the available capacity for this line. The upgraded Chino-Mira Loma No. 1 and 2 in Segment 8B would be tied in with the existing Chino-Mira Loma No. 3 220-kV T/L at the Mira Loma Substation. ~~Upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220-kV T/Ls in Segments 8B (6.8 miles) and 8C (built with Segment 8A) would also not occur (SCE, 2008b – DR#4: Q4-13). Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) and approximately 40 double-circuit 220-kV structures (associated with the re-build of Chino-Mira Loma No. 3) would no longer be constructed within Segment 8 (SCE, 2008b – DR#4: Q4-12).~~

Alternative 4C Modified

Alternative 4, Route C Modified ("Route 4C Modified") is similar to the original Route C option discussed above, with the exceptions that (1) the new gas-insulated switching station would be located approximately 2,500 feet northwest of the location described for the original Alternative 4C, (2) transmission line configurations and access roads would be altered to account for relocation of the switching station, and (3) re-routing of the existing single-circuit 500-kV towers in CHSP to the new switching station would occur utilizing double-circuit 500-kV towers. As with the original Route C, this proposed Route 4C Modified would also divert from the proposed Project Segment 8A at Mile 19.2, as well as re-route the existing 500-kV and 220-kV T/Ls from within CHSP, through a new switching station located north of CHSP. Specifics of the Route 4C Modified alternative are described in detail below.

After diverging from Segment 8A at Mile 19.2, Route 4C Modified would turn to the southeast, continuing for approximately 3.6 miles (versus 4.2 miles under the original Route 4C), running parallel and south of the existing Mira Loma–Walnut/Olinda 220-kV double-circuit T/L. This portion of Route 4C Modified would require a ROW expansion of approximately 150 feet in width to accommodate the new 500-kV double-circuit T/L structures. Approximately 0.2 mile north of the CHSP boundary, Route 4C Modified would turn east within a new 225-foot-wide ROW for 0.7 mile, remaining north of the CHSP boundary, then turning northeast for approximately 0.4 mile, still within the new 225-foor-wide ROW, to a new 500-kV gas-insulated switching

station. This portion of the Route 4C Modified Alternative, from the point it diverges from Segment 8A, would be approximately 4.7 miles long.

The gas-insulated switching station included under this alternative route would be approximately 6.2 acres in size and require between 15.7 and 18 acres of temporary disturbance (SCE, 2009e). The switching station would have similar dimensions as the switching station included under the original Route C alignment, described above, with the exception that under the Route 4C Modified Alternative, the switching station would be located approximately 2,500 feet north of its location under the original Route C. Consequently, the roads, which would require improvement and/or construction to accommodate the location of the switching station proposed under Route 4C Modified, would be different than those included under the original Route C Alternative. Access to the new switching station location for Route 4C Modified would require upgrading of approximately 3.6 miles (19,000 linear feet) of existing asphalt paved road along Old Woodview Road and through the Aerojet property (private), as well as construction of a new access road on the Aerojet property for approximately 0.3 mile to the new switching station site (SCE, 2009e).

Additionally, Route 4C Modified would also relocate two T/Ls currently aligned through the CHSP: the Lugo-Serrano 500-kV single-circuit T/L and the Mira Loma-Serrano 500-kV single-circuit T/L. Approximately 1.85 miles of each of these existing T/Ls would be removed from CHSP, including approximately 0.3 mile of each T/L located within the environmentally sensitive Water Canyon Natural Preserve. As a result, approximately 15 single-circuit 500-kV structures would be permanently removed from CHSP.

In order to maintain the Lugo/Mira Loma-Serrano connections, a new 500-kV double circuit T/L accommodating both of the existing 500-kV single-circuit T/Ls would be connected through the new switching station (north of the CHSP). This re-route would include two portions: a south-north portion traveling into the new switching station and a north-south/west-east portion traveling out of the new switching station and connecting with the existing Lugo/Mira Loma-Serrano T/Ls within CHSP. In total, these re-routes include approximately 3.7 miles of new 500-kV double-circuit structures, 3.0 miles of which would be within CHSP; and 3.3 miles of new ROW (Note: approximately 0.4 miles of the T/Ls are within common new ROW).

The new south-north re-route of the Lugo/Mira Loma-Serrano T/Ls into the new switching station would be approximately 1.8 miles in total length, including 1.5 miles within CHSP. This re-route would require a new 150-foot wide ROW to accommodate the one set of 500-kV double-circuit structures for the first 1.5 miles in CHSP. The next 0.3 mile outside CHSP would also be south-north, and would require a new 325-ft ROW to accommodate the re-routed 500-kV T/Ls entering and exiting the switching station and the re-routed 220-kV T/Ls going around the switching station, as described below. Approximately 9 new double-circuit and 2 new single-circuit 500-kV structures (11 total) would be required to re-route the 500-kV T/Ls into the switching station. Of these new 500-kV structures, 7 structures (5 double-circuit and 2 single-circuit) would be located within CHSP and 4 double-circuit structures would be located outside CHSP.

Exiting the switching station, the new re-routed 500-kV double-circuit T/L would proceed south for approximately 0.4 mile north of the CHSP, located within the 325-foot-wide ROW described above. The re-routed T/L would then enter CHSP and turn east and continue for approximately 1.5 miles to reconnect to the existing two sets of 500-kV single-circuit structures in the CHSP, just south of Raptor Ridge (1.9 miles total). The east-west alignment of the re-routed 500-kV double-circuit towers would initially be shared with the re-routed 220-kV double-circuit towers (discussed below) and would therefore require a new 225-ft ROW in CHSP for the first approximately 0.7 miles, after which the 220-kV T/Ls re-connect with the existing 220-kV T/Ls and the 500-kV double-circuit towers continue east for the remaining 0.8 miles in a new 200-foot ROW to reconnect with the existing 500-kV single-circuit towers. Approximately 12 new double-circuit and 2 new

single-circuit 500-kV structures (14 total) would be required to re-route the 500-kV T/Ls out of the switching station. Of these new 500-kV structures, 9 structures (7 double-circuit and 2 single-circuit) would be located within CHSP and 5 double-circuit structures would be located outside CHSP. In total, approximately 21 new 500-kV double-circuit LSTs and 4 new 500-kV single-circuit LSTs (approximately 16 within CHSP and 9 outside CHSP) would be required for re-routing of the Lugo/Mira Loma-Serrano 500-kV T/Ls into and out of the new switching station.

In addition to the diverted portion of Segment 8A and the re-route of the existing Lugo/Mira Loma-Serrano T/Ls described above, the Route 4C Modified alternative would also include a re-route of the existing Mira Loma-Walnut/Olinda 220-kV double-circuit T/L, to relocate structures outside CHSP (similar to the description provided under the original Route C). As a result, approximately eight (8) 220-kV double-circuit structures would be permanently removed (6 removed from CHSP) along approximately 2.15 miles (of which 1.8 miles would be within CHSP). Beginning approximately 0.3 mile northwest of the CHSP boundary (outside of CHSP), the existing 220-kV double-circuit structures would be re-routed away from the CHSP to parallel the new Mira Loma-Vincent 500-kV T/L (Segment 8A) structures, traveling in an eastern direction, north of the CHSP boundary, for approximately 0.7 mile and then northeast for approximately 0.4 mile, towards the new switching station, located within a new 225-foot-wide ROW. This 220-kV T/L would bypass the new switching station, traveling east in a new 100-foot-wide ROW for approximately 0.2 mile along the northern boundary of the new switching station, then turn south for approximately 0.5 mile outside CHSP. At this point, the re-routed 220-kV T/L would enter CHSP and turn in an easterly direction for approximately 0.7 mile, running parallel to the re-routed Lugo/Mira Loma-Serrano 500-kV T/Ls described above, reconnecting with the existing 220-kV double-circuit structures within CHSP, just south of Raptor Ridge. In total, this 220-kV re-route would be approximately 2.5 miles in length, requiring approximately 15 new double-circuit 220-kV LSTs (approximately 4 within CHSP and 11 outside CHSP).

Re-routes of the Lugo/Mira Loma-Serrano 500-kV T/Ls and the Mira Loma-Walnut/Olinda 220-kV T/L described above would also occur under the original Route C, as described above; however, the configurations and lengths of these re-routes would vary between the original Route C and the proposed Route 4C Modified. Same as with the original Route C, this Route 4C Modified would avoid the need for transmission line construction and upgrades along Segment 8A of the proposed Project, between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario. Consequently, as with the original Route 4C, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) and three double-circuit 220-kV structures would no longer be constructed within Segments 8A and 8C. However, per the 2009 California Independent System Operator (CAISO) Transmission Plan, the Chino-Mira Loma No.3 220-kV T/L would need to be upgraded before the summer of 2013 and the Chino-Mira Loma No. 2 and No. 3 220-kV T/Ls would need to be upgraded before the summer of 2018 to prevent violations of reliability criteria (CAISO, 2009). As such, the existing Chino-Mira Loma No. 1 220-kV T/L in Segment 8B (6.8 miles) would be upgraded with approximately 37 new 220-kV double-circuit structures to accommodate the upgrades of Chino – Mira Loma No.1 and No.2 220-kV T/Ls, as proposed under Alternative 2 (SCE's Proposed Project), with the exception that no new ROW would be required along Segment 8B. With these upgrades, the Chino-Mira Loma No. 3 220-kV T/L would in effect also be upgraded, as the existing double-circuit structures that currently carry two circuits (Chino – Mira Loma No. 2 and No. 3 220-kV T/Ls) would now be utilized for a single circuit, thereby increasing the available capacity for this line. The upgraded Chino-Mira Loma No. 1 and 2 in Segment 8B would be tied in with the existing Chino-Mira Loma No. 3 220-kV T/L at the Mira Loma Substation.

2.4.3.2 Alternative 4C Construction

As described above, Alternative 4C and Alternative 4C Modified would have no upgrades within Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario; however, upgrades would occur in Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario. ~~or within Segments 8B and 8C (Chino Mira Loma No. 1, 2, and 3 220 kV T/Ls); however~~In addition, new structures and permanent access and spur roads would be required to connect the new double-circuit 500-kV T/L to the new switching station to be located north of CHSP and to loop the existing 500-kV T/Ls into the new switching station and re-route the existing 220-kV T/Ls. Construction of Alternative 4C and Alternative 4C Modified would be conducted as described in Section 2.2.12 for the proposed Project, with the exception of the switching station, which is a new element associated with Alternative 4C and Alternative 4C Modified, and Mira Loma Substation, which would not be upgraded as part of this alternative as the new switching station would in effect connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation.

2.4.3.2.1 Construction Equipment and Workforce

Construction equipment and workforce needs for Alternative 4C and Alternative 4C Modified would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-11 through 2.2-17 (located at the end of Chapter 2); however additional equipment and workforce would be required for Segment 8, specifically for constructing the switching station. Table 2.4-7 and Table 2.4-1a (located at the end of Chapter 2) provide~~s~~ an estimate of the equipment and workforce associated with Segment 8A for Alternative 4C, and Segment 8B for all the Alternative 4 routes, respectively. For Alternative 4C Modified, the equipment and workforce would be identical to that shown in Table 2.4-7 and Table 2.4-1a, although the durations for some construction elements would differ slightly. Specifically, within Segment 8A (see Table 2.4-7) the duration for wreck out of conductors, structures and foundations would decrease from 3.25 months to 3 months, the duration for tower hauling/assembly erection would increase from 8.75 months to 9 months, and cleanup activities would increase from 3.5 months to 4 months (SCE, 2009g). The estimated equipment and workforce needs for the substation elements for Alternative 4C and Alternative 4C Modified, with the exception of Mira Loma Substation, would be identical to the proposed Project and are provided in Tables 2.2-19 through 2.2-23 (located at the end of Chapter 2). It is assumed that no work would be required at Mira Loma Substation as a result of Alternative 4C or Alternative 4C Modified, as this alternative would in effect connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation at the new switching station.

2.4.3.2.2 Land Disturbance

Land disturbance associated with Alternative 4C and Alternative 4C Modified would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-2 through 2.2-8 (located at the end of Chapter 2); however, the surface land disturbance within Segment 8 would differ as a result of the new switching station, new permanent access and spur roads, and the need for fewer structures due to the reroute. As noted above, no upgrades would occur in Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario; however, upgrades would occur in Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario. ~~Upgrades to the existing Chino Mira Loma No. 1, 2, and 3 220 kV T/Ls in Segments 8B and 8C would also not occur (SCE, 2008b – DR#4: Q4-13).~~ Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) ~~and approximately 40 double circuit 220 kV structures (associated with the re-build of Chino~~

~~Mira Loma No. 3)~~ would be eliminated from Segment 8 thereby reducing the land disturbance associated with Alternative 4C and Alternative 4C Modified (SCE, 2008b – DR#4: Q4-12).

For Alternative 4C and Alternative 4C Modified, ~~N~~new land disturbance would occur as a result of new T/L structures being installed from the point of deviation (S8A MP 19.2) to the new switching station within CHSP and to loop the existing 500-kV T/Ls into the switching station and to re-route the existing 220-kV T/Ls outside of CHSP. As noted above for Alternative 4C, approximately 19 double-circuit 500-kV LSTs would be required to complete the approximately 5.7-mile re-route to the new switching station; approximately 30 new single-circuit 500-kV LSTs would be required to complete the two re-routes of the existing 500-kV T/Ls; and approximately 17 new double-circuit 220-kV LSTs would be required to complete the 220-kV re-route (SCE, 2008b – DR#4: Q4-34, Q4-35, and Q4-38). In addition, approximately 17 LSTs of the existing single-circuit 500-kV T/Ls would be removed, and approximately 10 existing 220-kV double-circuit LSTs within CHSP and 2 outside CHSP (12 total) would be removed (SCE, 2008b – DR#4: Q4-33, Q4-36, and Q4-38). For Alternative 4C Modified, approximately 15 double-circuit 500-kV LSTs would be required to complete the approximately 4.7-mile re-route to the new switching station; approximately 21 new double-circuit and 4 new single-circuit 500-kV LSTs (25 total) would be required to complete the two re-routes of the existing single-circuit 500-kV T/Ls; and approximately 15 new double-circuit 220-kV LSTs would be required to complete the 220-kV re-route. In addition, approximately 15 existing single-circuit 500-kV LSTs would be removed within CHSP, and approximately 6 existing double-circuit 220-kV LSTs within CHSP and 2 outside CHSP (8 total) would be removed. For both Alternative 4C and Alternative 4C Modified, ~~N~~new land disturbance would also result from the addition of new permanent access and spur roads.

Construction of the gas-insulated switching station for Alternative 4C would require substantial cut and fill as the area identified for the switching station consists mostly of steep hilly terrain. Grading would be completed, assuming that a balanced fill and cut would be achieved, to avoid the importing or exporting of soil (SCE, 2008b – DR#4: Q4-28). The cut soil would be removed from the high side slopes and placed on the lower slopes until a level pad has been built. The exception would be the removal from the site of approximately 8,000 cubic yards of waste consisting of soil mixed with organic material and rocks, which cannot be reused within the graded area and would need to be exported to an approved dump site (SCE, 2008b – DR#4: Q4-28). Whether a cut and fill balance can be achieved at the switching station location cannot be assured without the completion of final engineering; should the engineering data prove so, some importing or exporting of soil may be necessary. The enclosed switching station would measure approximately 432 feet by 622 feet (6.2 acres); although, the area of disturbance would encompass approximately 32 acres, including safety buffers and slide slope allowances for transitioning from existing terrain to the proposed graded pad (SCE, 2009e). Similarly, for Alternative 4C Modified, the enclosed switching station would be approximately 6.2 acres; however, the area of disturbance would encompass between approximately 15.7 acres (grading scheme 2 – all-cut approach) and 18 acres (grading scheme 1 – balanced cut/fill approach) (SCE, 2009e). ~~The total footprint of the switching station site, including the enclosed switching station, safety buffers and side slope allowances for transition from existing terrain to the proposed graded pad would measure approximately 580 feet by 750 feet and contain approximately 10 acres of disturbed land (SCE, 2008b – DR#4: Q4-28).~~

Table 2.4-8 (located at the end of Chapter 2) provides an estimate of the surface land disturbance associated with Segments 8A and 8B for Alternative 4C. Table 2.4-8a (located at the end of Chapter 2) provides an estimate of the surface land disturbance associated with Segments 8A and 8B for Alternative 4C Modified. The estimated land disturbance associated with substation construction would be identical to the proposed Project for Alternative 4C and Alternative 4C Modified as described in Section 2.2.12.14 above and provided in Table

2.2-10, with the exception of the Mira Loma Substation, which would not require upgrades as a result of this alternative.

2.4.3.2.3 Hazardous Materials Usage and Waste Generation

As discussed in Section 2.2.12.15 for the proposed Project, construction of the Project would require limited use of hazardous materials, such as fuel, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the construction phase SWPPP(s) for the T/L segments and substation components.

Waste generated as part of Alternative 4C or Alternative 4C Modified would be identical to the proposed Project, as provided in Tables 2.2-26 to 2.2-32 (located at the end of Chapter 2), with the exception of Segment 8 where Alternative 4C and Alternative 4C Modified deviate~~s~~ from the proposed Project both in their ~~its~~ routing and overall components, including requiring a new switching station and no upgrades to Mira Loma Substation. As discussed above, construction of the new switching station for Alternative 4C would require exporting to an approved dump site approximately 8,000 cubic yards of waste consisting of soil mixed with organic material and rocks, which cannot be reused within the graded area (SCE, 2008b – DR#4: Q4-28). For Alternative 4C Modified, Scheme 1 (balance cut/fill approach) would result in a similar amount of export as Alternative 4C; however, Scheme 2 (all-cut approach) would result in approximately 700,000 cubic yards of earth that would need to be cut and exported from the switching station site (SCE, 2009g – DR#8: Q01).

Table 2.4-9 and Table 2.4-3a (located at the end of Chapter 2) provides an estimate of the construction waste associated with Segment 8A for Alternative 4C, including the new switching station, and Segment 8B for all the Alternative 4 routes, respectively. Table 2.4-9a (located at the end of Chapter 2) provides an estimate of the construction waste associated with Segment 8 for Alternative 4C Modified, again, including the new switching station. The estimated construction waste for the substation elements for Alternative 4C and Alternative 4C Modified, with the exception of Mira Loma Substation, would be identical to the proposed Project and are provided in Tables 2.2-34 through 2.2-38 (located at the end of Chapter 2). It is assumed that no work would be required at Mira Loma Substation as a result of Alternative 4C or Alternative 4C Modified, as this alternative would connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation at the new switching station.

2.4.3.2.4 Construction Schedule

Construction of Alternative 4C or Alternative 4C Modified would be identical to the proposed Project, as shown in Table 2.2-43 (located at the end of Chapter 2), with the exception of Segment 8, where fewer T/L structures would be necessary and a new switching station would be required. Construction of the re-routed T/L portion of Segment 8 (beginning at S8A MP 19.2), including modification of existing T/Ls for re-routes, would take approximately 12 months to complete (SCE, 2008b – Rev 0, Jul 21, 2008 schedule). Construction of the new switching station for Alternative 4C would take approximately one year to complete; however, depending on the civil improvements required, approximately two years would be required for engineering, procurement, and construction (SCE, 2008b – DR#4: Q4-29). For Alternative 4C Modified, engineering, procurement, and construction of the switching station is expected to take approximately 30 months (SCE, 2009g – DR#8: Q02b). It is assumed that this schedule would be accommodated within the ~~36~~ 47 months currently allotted for Segment 8 as shown in Table 2.2-43; however, this does not account for potential delays resulting from the need to obtain approval from the California State Park Commission to amend the Chino Hills State Park General Plan (see Section 3.9, Land Use) and/or potential delays associated with Department

of Toxic Substance Control (DTSC) approval and access restrictions to the Aerojet property (see Section 3.6, Environmental Contamination and Hazards).

2.4.3.3 Alternative 4C Operations and Maintenance

Operations and maintenance of the T/Ls and substations under Alternative 4C or Alternative 4C Modified would be the same as the proposed Project, as described in Section 2.2.13 above. SCE would operate and maintain all of the components of the Project in accordance with existing SCE procedures. No additional personnel would be required for operations of the new T/L, substation, switching station, and telecommunications infrastructure (SCE, 2007b – DR#1: Q006). Operations and maintenance of the 500-kV and 220-kV T/Ls would involve periodic inspection approximately once per year via helicopter and/or truck. Maintenance would be performed on an as-needed basis, including maintenance of the access roads to the final widths that would result from the construction of the Project (final widths are expected to range from 12 to 16 feet), and maintenance of erosion/drainage control structures (SCE, 2007b – DR#1: Q006). Preventative maintenance of telecommunications equipment would be scheduled approximately every six months to ensure system reliability and performance (SCE, 2007b – DR#1: Q006). General maintenance activities within the ANF would be the same as described for Alternative 2 (see Section 2.2.13).

2.4.3.4 Alternative 4C – Forest Service Permits and Plan Amendments

Requirements for Forest Service Permits and Plan Amendments would be identical to those described for Alternative 2 (see Section 2.2.14).

2.4.4 Chino Hills Route D Alternative

2.4.4.1 Alternative 4D Description

This alternative was suggested by the City of Chino Hills. This represents a refinement to the Chino Hills Route A Alternative. As shown in Figure 2.4-4, Alternative 4D would deviate from the proposed Project beginning about two miles east of State Route 57 (approximately S8A MP 19.2), where the existing Mira Loma – Walnut/Olinda 220-kV double-circuit T/L and the existing un-energized Chino-Mesa T/L (both in the same corridor as that of Segment 8A) separate from one another. At that point, the new Mira Loma-Vincent 500-kV T/L would turn southeast, remaining parallel and north of the existing Mira Loma – Walnut/Olinda 220-kV double-circuit T/L for approximately 4.2 miles, up to the CHSP boundary, traversing Los Angeles, Orange, and San Bernardino Counties. Along this portion of the alignment, approximately 150-feet of additional ROW would be required to accommodate the new 500-kV double-circuit structures (SCE, 2008b – DR#4:Q4-45). At this point, the new Mira Loma-Vincent 500-kV T/L would turn east within a new 200-foot-wide ROW and follow the northern boundary of CHSP for approximately 3.7 miles to just east of Bane Canyon. At this point the alignment would turn southeast, traversing the northeast corner of CHSP for approximately 1.4 miles (new ROW within CHSP), at which point the new 500-kV T/L would turn northeast again parallel and north of the existing T/Ls for approximately 0.5 mile (outside CHSP) before terminating at a new 500-kV gas-insulated switching station located outside of CHSP, just south of the existing 500-kV T/Ls. New permanent access and spur roads would be required to access the transmission structures and switching station constructed as part of this alternative. An all-weather (e.g., paved) access road would be required to provide for year-round access to the switching station, which would be access off of Butterfield Ranch Road (see Figure 2.4-4).

For this approximately 9.8-mile re-route, approximately 47 new double-circuit 500-kV structures would be required, of which approximately 5 to 8 would be within CHSP (SCE, 2008b – DR#4: Q4-44 and Q4-46). In addition, the re-route work at the new switching station would include replacing four existing double-circuit 220-kV suspension and dead-end lattice structure with four single-circuit 220-kV 3-pole steel dead-end structures; replacing two existing double-circuit 500-kV suspension lattice structures with dead-end structures; and the installation of two new double-circuit 500-kV dead-end lattice structures outside of the switching station area (SCE, 2008b – DR#4: Q4-46). At the point of deviation (S8A MP 19.2), an existing 220-kV lattice structure would also be replaced with a 220-kV lattice dead-end structure to move the wires out of the way for the new 500-kV wires and structures (SCE, 2008b – DR#4: Q4-46).

The new gas-insulated switching station would be a minimum of 4 to 5 acres in size, allowing for power to be transferred along the existing 500-kV transmission lines to Mira Loma Substation. For the gas-insulated switching station, the entire system would be enclosed in a sheet metal building, which would require an air conditioning system (SCE, 2008c). The building would be approximately 42-feet high and the dead-end structures on either side of the building would be approximately 65-feet high (SCE, 2008c). As noted above, Figure 2.4-1a provides an example of gas-insulated switchgear technology/equipment at SCE's new Rancho Vista Substation located in Rancho Cucamonga, San Bernardino County, California.

Telecommunications facilities would be included as part of the construction and operation of the new 500-kV switching station to support protective relaying, SCADA, voice, and data applications at the switching station. Telecommunications facilities would likely include lightwave (LW) transmission and channel equipment, and could also include microwave (MW) transmission equipment. The construction of telecommunication lines to the new switching station could be accomplished either through installation of fiber optic overhead ground wire on the top of the proposed T/Ls with terminal equipment at the far ends of the lines, by installing fiber optic cable overhead on wooden poles or placing underground in communication ducts, or by creating microwave paths (SCE, 2009a). Power (AC) to the switching station would also be required to operate pumps, fans, compressors, lights, battery chargers, and other equipment (SCE, 2009a). At least two independent sources of power would be required, which would generally be delivered at 12 kV. This would require connections to distribution systems associated with two independent 220-kV transmission substation systems, such as the Olinda and Chino subtransmission systems (SCE, 2009a). To bring the power to the substation, the existing overhead 12-kV lines in the area would be extended to the proposed switching station. An on-site emergency generation may also be provided. Additional details regarding the required communications and power for the new switching station would be determined as part of final engineering.

As a result of this alternative, no upgrades would occur in Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario. Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) and three double-circuit 220-kV structures would no longer be constructed within Segments 8A and 8C. However, per the 2009 California Independent System Operator (CAISO) Transmission Plan, the Chino-Mira Loma No.3 220-kV T/L would need to be upgraded before the summer of 2013 and the Chino-Mira Loma No. 2 and No. 3 220-kV T/Ls would need to be upgraded before the summer of 2018 to prevent violations of reliability criteria (CAISO, 2009). As such, the existing Chino-Mira Loma No. 1 220-kV T/L in Segment 8B (6.8 miles) would be upgraded with approximately 37 new 220-kV double-circuit structures to accommodate the upgrades of Chino – Mira Loma No.1 and No.2 220-kV T/Ls, as proposed under Alternative 2 (SCE's Proposed Project), with the exception that no new ROW would be required along Segment 8B. With these upgrades, the Chino-Mira Loma No. 3 220-kV T/L would in effect also be upgraded, as the existing double-circuit structures that currently carry two circuits (Chino – Mira Loma No. 2 and No. 3 220-kV T/Ls) would now be utilized for a single circuit, thereby increasing the available

capacity for this line. The upgraded Chino-Mira Loma No. 1 and 2 in Segment 8B would be tied in with the existing Chino-Mira Loma No. 3 220-kV T/L at the Mira Loma Substation. ~~Upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220 kV T/Ls in Segments 8B (6.8 miles) and 8C (built with Segment 8A) would also not occur (SCE, 2008b – DR#4: Q4 13). Consequently, approximately 78 double-circuit 500 kV structures (18 LSTs and 60 TSPs) and approximately 40 double-circuit 220 kV structures (associated with the re-build of Chino-Mira Loma No. 3) would no longer be constructed within Segment 8 (SCE, 2008b – DR#4: Q4 12).~~

2.4.4.2 Alternative 4D Construction

As described above, Alternative 4D would have no upgrades within Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario; however, upgrades would occur in Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario. ~~or within Segments 8B and 8C (Chino-Mira Loma No. 1, 2, and 3 220 kV T/Ls); however~~In addition, new structures and permanent access and spur roads would be required to connect the new double-circuit 500-kV T/L to the new switching station to be located east of CHSP and to loop the existing 500-kV T/Ls into the new switching station. Construction of Alternative 4D would be conducted as described in Section 2.2.12 for the proposed Project, with the exception of the switching station, which is a new element associated with Alternative 4D, and Mira Loma Substation, which would not be upgraded as part of this alternative as the new switching station would in effect connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation.

2.4.4.2.1 Construction Equipment and Workforce

Construction equipment and workforce needs for Alternative 4D would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-11 through 2.2-17 (located at the end of Chapter 2); however additional equipment and workforce would be required for Segment 8, specifically for constructing the switching station. Table 2.4-10 and Table 2.4-1a (located at the end of Chapter 2) provides an estimate of the equipment and workforce associated with Segment 8A for Alternative 4D, and Segment 8B for all the Alternative 4 routes, respectively. The estimated equipment and workforce needs for the substation elements for Alternative 4D, with the exception of Mira Loma Substation, would be identical to the proposed Project and are provided in Tables 2.2-19 through 2.2-23 (located at the end of Chapter 2). It is assumed that no work would be required at Mira Loma Substation as a result of Alternative 4D, as this alternative would in effect connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation at the new switching station.

2.4.4.2.2 Land Disturbance

Land disturbance associated with Alternative 4D would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-2 through 2.2-8 (located at the end of Chapter 2); however the surface land disturbance within Segment 8 would differ as a result of the new switching station, new permanent access and spur roads, and the need for fewer structures due to the reroute around and through the northeast corner of CHSP. As noted above, no upgrades would occur in Segment 8A between S8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario; however, upgrades would occur in Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario. ~~Upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220 kV T/Ls in Segments 8B and 8C would also not occur (SCE, 2008b – DR#4: Q4 13).~~ Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) ~~and approximately 40 double-circuit 220 kV structures (associated with the~~

~~re-build of Chino-Mira Loma No. 3)~~ would be eliminated from Segment 8 thereby reducing the land disturbance associated with Alternative 4D (SCE, 2008b – DR#4: Q4-12).

New land disturbance would occur as a result of new T/L structures being installed from the point of deviation (S8A MP 19.2) to the new switching station east of CHSP and to loop the existing 500-kV T/Ls into the switching station. As noted above, this would amount to approximately 47 new double-circuit 500-kV structures for the approximately 9.8-mile re-route, 4 new double-circuit 500-kV dead-end structures, and 5 new 220-kV structures(SCE, 2008b – DR#4: Q4-46). New land disturbance would also result from the addition of new permanent access and spur roads.

Construction of the gas-insulated switching station would require substantial cut and fill as the area identified for the switching station consists mostly of steep hilly terrain. Grading would be completed, assuming that a balanced fill and cut would be achieved, to avoid the importing or exporting of soil (SCE, 2008b – DR#4: Q4-41). The cut soil would be removed from the high side slopes and placed on the lower slopes until a level pad has been built. The exception would be the removal from the site of approximately 8,000 cubic yards of waste consisting of soil mixed with organic material and rocks, which cannot be reused within the graded area and would need to be exported to an approved dump site (SCE, 2008b – DR#4: Q4-41). Whether a cut and fill balance can be achieved at the switching station location cannot be assured without the completion of final engineering; should the engineering data prove so, some importing or exporting of soil may be necessary. The total footprint of the switching station site, including the enclosed switching station, safety buffers and side slope allowances for transition from existing terrain to the proposed graded pad would measure approximately 580 feet by 750 feet and contain approximately 10 acres of disturbed land (SCE, 2008b – DR#4: Q4-41).

Table 2.4-11 (located at the end of Chapter 2) provides an estimate of the surface land disturbance associated with Segments 8A and 8B for Alternative 4D. The estimated land disturbance associated with substation construction would be identical to the proposed Project for Alternative 4D as described in Section 2.2.12.14 above and provided in Table 2.2-10, with the exception of the Mira Loma Substation, which would not require upgrades as a result of this alternative.

2.4.4.2.3 Hazardous Materials Usage and Waste Generation

As discussed in Section 2.2.12.15 for the proposed Project, construction of the Project would require limited use of hazardous materials, such as fuel, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the construction phase SWPPP(s) for the T/L segments and substation components.

Waste generated as part of Alternative 4D would be identical to the proposed Project, as provided in Tables 2.2-26 to 2.2-32 (located at the end of Chapter 2), with the exception of Segment 8 where Alternative 4D deviates from the proposed Project both in its routing and overall components, including requiring a new switching station and no upgrades to Mira Loma Substation. As discussed above, construction of the new switching station would require exporting to an approved dump site approximately 8,000 cubic yards of waste consisting of soil mixed with organic material and rocks, which cannot be reused within the graded area (SCE, 2008b – DR#4: Q4-41).

Table 2.4-12 and Table 2.4-3a (located at the end of Chapter 2) provides an estimate of the construction waste associated with Segment 8A for Alternative 4D, including the new switching station, and Segment 8B for all the Alternative 4 routes, respectively. The estimated construction waste for the substation elements for Alternative 4D, with the exception of Mira Loma Substation, would be identical to the proposed Project and

are provided in Tables 2.2-34 through 2.2-38 (located at the end of Chapter 2). It is assumed that no work would be required at Mira Loma Substation as a result of Alternative 4D, as this alternative would connect the new 500-kV T/Ls to existing 500-kV T/Ls that already connect to Mira Loma Substation at the new switching station.

2.4.4.2.4 Construction Schedule

Construction of Alternative 4DA would be identical to the proposed Project, as shown in Table 2.2-43 (located at the end of Chapter 2), with the exception of Segment 8, where fewer T/L structures would be necessary and a new switching station would be required. Construction of the re-routed T/L portion of Segment 8 (beginning at S8A MP 19.2), including modification of existing T/Ls to tie into the new switching station, would take approximately 10.5 months to complete (SCE, 2008b – Rev 0, Jul 21, 2008 schedule). Construction of the new switching station would take approximately one year to complete; however, depending on the civil improvements required, approximately two years would be required for engineering, procurement, and construction (SCE, 2008b – DR#4 Q4-19). It is assumed that this schedule would be accommodated within the ~~36~~ 47 months currently allotted for Segment 8 as shown in Table 2.2-43; however, this does not account for potential delays resulting from the need to obtain approval from the California State Park Commission to amend the Chino Hills State Park General Plan (see Section 3.9, Land Use) and/or potential delays associated with Department of Toxic Substance Control (DTSC) approval and access restrictions to the Aerojet property (see Section 3.6, Environmental Contamination and Hazards).

2.4.4.3 Alternative 4D Operations and Maintenance

Operations and maintenance of the T/Ls and substations under Alternative 4D would be the same as the proposed Project, as described in Section 2.2.13 above. SCE would operate and maintain all of the components of the Project in accordance with existing SCE procedures. No additional personnel would be required for operations of the new T/L, substation, switching station, and telecommunications infrastructure (SCE, 2007b – DR#1: Q006). Operations and maintenance of the 500-kV and 220-kV T/Ls would involve periodic inspection approximately once per year via helicopter and/or truck. Maintenance would be performed on an as-needed basis, including maintenance of the access roads to the final widths that would result from the construction of the Project (final widths are expected to range from 12 to 16 feet), and maintenance of erosion/drainage control structures (SCE, 2007b – DR#1: Q006). Preventative maintenance of telecommunications equipment would be scheduled approximately every six months to ensure system reliability and performance (SCE, 2007b – DR#1: Q006). General maintenance activities within the ANF would be the same as described for Alternative 2 (see Section 2.2.13).

2.4.4.4 Alternative 4D – USDA Forest Service Permits and Plan Amendments

Requirements for Forest Service Permits and Plan Amendments would be identical to those described for Alternative 2 (see Section 2.2.14).

2.5 Alternative 5: Partial Underground Alternative

This alternative was developed to avoid impacts of the proposed Project's overhead transmission lines in residential areas in the City of Chino Hills. The transmission line route for Alternative 5 would be the same as the proposed Project, with the exception that the line would be installed underground for approximately 3.5 miles through Chino Hills. Primary components of the proposed underground segment, which include Gas Insulated Line (GIL) system infrastructure, aboveground transition stations, an underground tunnel, and

vertical access shafts, are described below in Section 2.5.1. Construction activities associated with the underground segment are discussed in Section 2.5.2; operational requirements and considerations are presented in Section 2.5.3.

2.5.1 Alternative 5 Description

The proposed route for Alternative 5 would follow the same route as the proposed Project; however, an approximately 3.5-mile portion of the Alternative 5 route along Segment 8 would be installed underground (see Figure 2.5-1). Alternative 5 would be identical to the proposed Project (Alternative 2) with respect to Segments 4, 5, 6, 7, 10, and 11 as discussed in Sections 2.2.3 through 2.2.8. All substation and information technology facilities would also be identical to the proposed Project as discussed in Sections 2.2.10 and 2.2.11, respectively. Construction of Alternative 5 would be the same as the proposed Project as discussed in Section 2.2.12, with the exception of the underground portion described in Section 2.5.2 below.

Under this alternative, the proposed transmission line would shift from overhead to underground at approximately MP 21.9 of Segment 8A and would continue underground through the City of Chino Hills to approximately MP 25.4 of Segment 8A, where the underground line would shift back to overhead. Gas Insulated Line (GIL) technology would be utilized for the underground portion of Alternative 5. There is an existing aboveground T/L along the proposed underground portion of Alternative 5, consisting of a single-circuit 220-kV T/L on LST structures. For the purposes of this alternative, it is assumed that the existing aboveground T/L infrastructure would remain in place and would not be removed as part of Alternative 5. As mentioned above, primary components of the proposed underground segment include GIL system infrastructure, aboveground transition stations, an underground tunnel, and vertical access shafts, which are described in further detail below.

GIL System Infrastructure

Components of the GIL system for Alternative 5, as shown in Figure 2.5-2, would include the following for each single-phase GIL: bellows (appear periodically along the alignment to allow for thermal expansion of the line; therefore, are not shown in Figure 2.5-2); bus/conductors (rigid 8-inch diameter aluminum tubes); insulation (dual system comprised of solid dielectric insulators to support the bus/conductor within the enclosure tube and insulating gases composed of ~~40 percent Nitrogen (N_2) and 60~~ 100 percent Sulfur Hexafluoride (SF_6); and pipe enclosure (houses the bus/conductors and insulation). The pipe enclosure for each single-phase GIL would consist of a 30-inch diameter grounded aluminum pipe and would be installed in 60-foot sections, due to manufacturer specifications which limit the minimum length of each pipe section to be 60 feet. These sections would be fitted together to stretch the entire 3.5-mile length of the underground segment. A total of three GIL assemblies such as depicted in Figure 2.5-2 are required to accommodate one three-phase circuit at the 500-kV voltage level; therefore, because Alternative 5 includes double-circuit T/Ls, the GIL system for this alternative would require six individual GIL assemblies (three for each circuit), all of which would be built along the entire approximately 3.5-mile length of the underground segment.

As a precaution in the potential event of a gas leak, the pipe enclosures would include gas safety compartments, separated by cone insulator assemblies that prevent the movement of gas from one compartment to another. By compartmentalizing the pipe enclosures with this design, in the case of a gas leak, the quantity of gas in any one compartment would be restricted to a manageable level. Compartmentalization of the pipe enclosures would also control damage in case of an internal failure and would generally facilitate installation, operation, and maintenance of the GIL assemblies. Each gas safety compartment would be

approximately 4,000 feet long (0.75 mile), and would be equipped with pressure monitoring equipment designed to provide both visual and remote alarms should the gas pressure increase or decrease to unacceptable levels.

Transition Stations

In order to install the underground portion of Alternative 5, a dead end structure and transition station would be required at each terminus of the underground GIL system, as shown in Figure 2.5-1. Each transition station would be approximately 220 feet wide and 320 feet long (1.6 acres), located partially within existing ROW. It is assumed that SCE would require fee ownership of the land upon which the transition facilities are located, as they would exceed the existing ROW width (SCE, 2008c, DR#5-11). As shown in Figures 2.5-3 and 2.5-4, permanent aboveground features at each transition station would include, among other components, an A-frame overhead line termination or dead-end structure, approximately 90 feet tall, to transition the T/Ls from the LST structures to the GIL system. The A-frame would include two "bays," one for each 500-kV circuit with a total width of 180 feet and with GIL transition infrastructure included for each of the six phases[5], to transfer the lines from the A-frame structure to the tunnel access shaft leading down to the underground tunnel. Another permanent aboveground feature of the transition station would be a housing structure to enclose the entrance to the vertical access shaft which leads down to the underground tunnel; the purpose of this structure is for security and public safety. These project features are described in further detail below. Additional structure(s) may also be required to house communication and environmental monitoring equipment (SCE, 2008d). Depending on the final design of the transition station, a permanent electric gantry crane may be installed at each transition station for installation of the GIL infrastructure, or diesel powered cranes may be temporarily brought to the sites during installation and maintenance activities (SCE, 2008d). Buildings constructed around the access shafts would be approximately 100-feet long by 75-feet wide and at least as high as the permanently installed gantry cranes (possibly 25-feet tall) (SCE, 2008d). Construction and operation of the two GIL transition stations would also include telecommunications facilities to support SCADA, voice, and data applications at each station. Telecommunications facilities constructed would likely include lightwave (LW) transmission and channel equipment.

The two transition stations required for Alternative 5 are referred to as the Western Transition Station and the Eastern Transition Station. The Western Transition Station would be located in an area just west of the current terminus of Eucalyptus Avenue in the City of Chino Hills, at approximately S8A MP 21.9. The new Pine Valley Estates housing development is currently under construction in this area; however, the proposed transition station would be situated generally within the existing ROW west of the planned residential lots, which are expected to be located on the east-facing slopes overlooking the existing West Hills Country Club golf course and Carbon Canyon Road. The western portion of the Pine Valley Estates property, where the Western Transition Station would be situated, is expected to remain largely as open space.

The Eastern Transition Station would be located near State Highway 71 and Pipeline Avenue in the City of Chino Hills. Specifically, this transition station would be situated approximately 0.1 mile west of Pipeline Avenue (S8A MP 25.4), adjacent and north of an existing flood control channel. The current 150-foot width of the ROW in this area would not be sufficient to accommodate the required 220-foot width of the transition station. Furthermore, considering the flood control channel located immediately south of the ROW in this

[5] GIL transition infrastructure would include, for each of the six phases, the following components: a surge arrestor, a coupling capacitor voltage transformer (CCVT) and Wave Trap, which are associated with the power line carrier communication circuit; bus/conductors (rigid 8-inch diameter aluminum tubes) and jumpers for connecting to an air/GIL

location, installation of the Eastern Transition Station would require that the ROW be expanded to the north. Existing land uses immediately north of the ROW include a car wash operation, a retail business, and a parking lot, all of which would need to be converted to utility usage with installation of the transition station.

Underground Tunnel

For Alternative 5, the GIL system would be housed in an underground tunnel. It appears that SCE currently occupies the existing T/L ROW by virtue of easements obtained from the original land owners, who retained underlying fee ownership of the land (SCE, 2008c, DR#5-11). Consequently, SCE may need to perfect those rights prior to construction of the underground tunnel. The underground tunnel would be lined with one-foot-thick pre-cast concrete wall sections as shown in Figure 2.5-5. Tunnel installation was selected in favor of direct burial (trenching) due to reliability issues associated with corrosion, grounding, thermal expansion, electrical ampacity, and operational concerns that would be avoided or minimized through tunnel installation. The tunnel utilized for this alternative would be circular, with a 16-foot internal diameter and an 18-foot external diameter, accounting for the one-foot-thick tunnel walls. As mentioned, tunnel access would be provided via vertical shafts installed at either end of the underground segment, connecting the underground tunnel to each of the transition stations at the surface (described above). From the western access shaft and transition station, the tunnel would generally follow the proposed Project route, traveling in an easterly direction for approximately 3.5 miles to the eastern access shaft and transition station.

Due to the topography of this region (see Figure 2.5-5), tunnel boring would initiate at the Eastern Transition Station and would proceed underground toward the Western Transition Station, maintaining a very mild upward gradient which is currently assumed to not exceed three percent. The purpose of this mild gradient (as opposed to installing a level tunnel) is to reduce the distance from the tunnel to the ground surface at the Western Transition Station, which due to the area's topography is several hundred feet higher in elevation than that of the Eastern Transition Station and, as such, the depth of the tunnel below ground surface is substantially greater at the Western Transition Station than at the Eastern Transition Station. The tunnel slope or gradient would be no greater than three percent in order to maximize reliability of the GIL system enclosed in the tunnel; to ensure access for construction and maintenance personnel and equipment; and to facilitate mobilization of necessary infrastructure throughout the tunnel using custom transport vehicles, which would otherwise be hindered by a steep gradient.

Inside the tunnel, the six pipe enclosures (GIL assemblies) would be mounted on two support racks, one along either wall of the tunnel, with three pipes stacked vertically on each support rack. Once installed, the GIL racks on each side of the tunnel would be approximately seven feet apart, as depicted in Figure 2.5-5. In the space between the GIL racks, a six-foot-wide walkway would allow for access throughout the tunnel. As mentioned, access to the tunnel would be provided via a vertical access shaft at either end of the underground segment. From these shafts, construction and maintenance personnel would be able to use the walkway for tunnel access by foot, or by using custom transport vehicles. Other components of the underground tunnel which are further described below include the following: monitoring systems; a ventilation system; a lighting system; a communication system; a power source (both standard and emergency); and an electrical distribution system.

Monitoring Systems. Each gas segment would be equipped with pressure monitoring equipment designed to provide both visual and remote alarms should the gas pressure increase or decrease to unacceptable levels

bushing and the GIL enclosure tube. The GIL enclosure tube houses solid dielectric insulators to support the energized bus/conductor within the enclosure tube and insulating gases (N_2 and SF_6).

(SCE, 2008c, DR#5-11). A distributed temperature monitoring system would also be installed on the outer surface of the enclosures to provide real-time information on the condition of the GIL system and to ensure that the tunnel is cool enough to not cause de-rating of the gas insulation as a result of excessive temperatures. In addition, the tunnel would be equipped with oxygen monitors installed at appropriate intervals along the tunnel to insure that air quality in the tunnel is safe for human occupation. For worker safety, display panels would be located at each tunnel entrance to provide a visual display of conditions within the tunnel; this information would also be available for remote monitoring.

Ventilation System. A dual-purpose ventilation system would be installed at approximate one-mile intervals along the length of the tunnel, with each system connecting the underground tunnel with the surface grade via vertical ventilation shafts (see Figure 2.5-5). These systems would serve to remove heat from within the tunnel, and also to provide a source of oxygen for life support purposes in the tunnel. Heat removal is considered a critical function because, when loaded to capacity (approximately 4,500 amps), it would be possible for the GIL system (conductor and enclosure) to generate approximately 213 watts of heat per circuit foot. This heat would be removed from the tunnel using forced-air circulation. Fans would be located in each access chamber (at the base of the vertical access shafts) and at the middle ventilation shaft. Because the underground tunnel would result in a confined work space for GIL system construction and maintenance personnel, the ventilation systems would include a positive intake for worker safety and life support functions. It is anticipated that the air intake structures would be equipped with air filters and that louvers would be utilized at all air handling locations to minimize the intrusion of dust when the system is not in operation (SCE, 2008d). The aboveground features of these ventilation systems would be housed in simple structures at the surface, at least 25 feet long by 20 feet wide and 10 feet in height, and would be located at each ventilation shaft and each transition station (SCE, 2008d). Emergency access to the system would be designed for 24/7 access to the entire system.

It is anticipated that three aboveground ventilation system structures and shafts would be installed along the length of the underground segment, as shown in Figure 2.5-5 and discussed in more detail below. Ventilation noise would result from both the fan motors and as a result of air movement in and out of the shafts. SCE would design the ventilation system to minimize the velocity of air intake and exhaust to limit noise (SCE, 2008d). As a worst-case scenario, it is assumed that the ventilation system would be in operation continuously once tunnel construction is completed and the electrical equipment is being installed and tested (SCE, 2008d). Alternatively, operation would be expected whenever the tunnel is occupied (for life support) and/or when a circuit is heavily loaded (for heat dissipation).

Lighting System. Lighting, both standard and emergency, would be installed along the length of the tunnel as required for construction, maintenance, and damage repair activities.

Communication System. A communication system would be installed throughout the tunnel to facilitate communication during construction and operation of the GIL system. Communication stations would be installed at intervals along the tunnel and at various elevations within the access and ventilation shafts (SCE, 2008d).

Power Source. A power source would be required for the cooling fans necessary to run the ventilation system described above. An emergency power source would also be required to ensure system reliability in the case of an unplanned failure. Emergency power would most likely be provided via on-site generators.

Electrical Distribution System. A 12 kV electrical distribution system would be installed within the tunnel for construction and maintenance purposes (SCE, 2008d). As mentioned above, custom transport vehicles would

be utilized within the tunnel; such vehicles would require a source of power in order to transport pipe segments and other materials from the access shaft chambers at either end of the tunnel to their designated locations within the tunnel. Other purposes for which an electrical distribution system is necessary include the following, among others: lighting; welding equipment to join pipe segments during construction and maintenance; vacuum carts for evacuating pipe segments before filling with gas during initial construction activities and during maintenance and repair activities (in the case of a gas leak or pipe rupture); and gas carts for delivering gas to the pipe segments during initial construction and for adding gas during the life of the system or replacing gas after a failure.

Telemetry. Equipment would be installed to monitor the environment within the tunnel. The functions provided would include, but not be limited to, monitoring of air quality and air temperature and GIL system temperatures and pressures (SCE, 2008d).

Vertical Access Shafts

Access to the underground tunnel would be provided via a vertical access shaft located at each transition station. Each shaft would be at least 75 feet long and approximately 20 feet wide, to accommodate the horizontal lowering of 60-foot lengths of GIL bus/conductor into the tunnel (minimum length provided by manufacturer), the external tunnel width of 18 feet, and to allow for the installation of a service elevator and emergency access staircase (SCE, 2008d). The estimated depth required for the Western Transition Station access shaft to reach the underground tunnel would be approximately 420 feet, while the estimated depth of the Eastern Transition Station access shaft would be approximately 100 feet (SCE, 2008d), as shown in Figure 2.5-5.

In the interest of security and public safety, the surface-level entrance to the vertical access shafts would be sealed with a removable cover. The shaft entrance cover would be designed such that they could not be easily opened by a member of the public, but SCE maintenance personnel would be able to remove them in case access to the tunnel is required for maintenance or inspection purposes. It is presently assumed that a surface structure would also be constructed over the entrance to the vertical access shaft to further protect against public access and to house infrastructure that may be required for shaft and/or tunnel maintenance, such as a gantry crane. The access shafts would be located within the transition station boundaries and, as such, public access to the shafts would be protected by three physical barriers, including the outer transition station fencing and/or wall, the access shaft structure, and the access shaft cover.

Walls of the vertical shafts would be sealed with a grout material to protect against groundwater intrusion and to avoid disturbance of groundwater resources. At the bottom of each access and ventilation shaft, where the shaft meets the tunnel, a tunnel access chamber would be constructed. These “galleries” would be larger in both width and height than the tunnel diameter (final dimensions are assumed to be at least 50 percent greater than the diameter of the tunnel) to allow room for assembling equipment and materials and maneuvering. The vertical shafts and tunnel access chambers are permanent project features and would be maintained for the lifetime of the underground GIL system.

Ventilation System Shafts

It is anticipated that three aboveground ventilation system structures and shafts would be installed along the length of the underground segment, as shown in Figure 2.5-5. Air would be drawn from the tunnel at the access shafts and the center ventilation shaft; the other two ventilation shafts would function as air intakes. The three shafts are expected to be located west of Coral Ridge Park (S8A MP 22.9), west of Chino Hills Parkway

(S8A MP 23.7) and west of Peyton Drive (S8A MP 24.5) (SCE, 2008d). Based on these approximate locations, the depths of the three shafts would be approximately 175, 160 and 260 feet respectively, proceeding from east to west (SCE, 2008d). The diameter of these shafts is expected to be between 10 to 20 feet; however, final sizing of the shaft will be determined by the configuration of stairs and possibly an elevator (SCE, 2008d). The buildings securing the ventilation shafts or chimneys (aboveground) would be at least 25 feet long by 20 feet wide and 10 feet in height, and would be located at each ventilation shaft (SCE, 2008d).

2.5.2 Alternative 5 Construction

Construction of Alternative 5 would be the same as the proposed Project as discussed in Section 2.2.12, with the exception of the approximately 3.5-mile underground segment in Chino Hills. Construction activities associated with installation of the underground segment for Alternative 5 would occur at both the Western Transition Station and the Eastern Transition Station, although tunnel boring and excavation activities would be limited to the Eastern Transition Station. Excavated material would be removed from the tunnel at the Eastern Transition Station site as the depth to the tunnel would be approximately 100 feet at this location, as opposed to approximately 420 feet at the Western Transition Station site.

Shaft Excavation and Shoring

In order for tunneling activities to take place, the eastern access shaft and access chamber would first be installed. Due to the substantial depth of the access shafts and the volume of material that would be excavated from each approximately 75-foot by 20-foot shaft, conventional excavation techniques would be used in favor of drilling methods. Walls of the access shafts would be sealed with a grout material to protect against groundwater intrusion and to avoid disturbance of groundwater resources. Excavation for ventilation shafts would likely be accomplished using drill/auger excavation methods. All excavated material would be transported off-site for disposal at approved facilities.

Tunnel Boring and GIL Installation

Tunneling activities required for Alternative 5 would consist of the excavation of vertical access shafts (as described above), inclined straight-line boring to remove the earthen materials between the eastern and western shafts, installation of concrete tunnel lining, and installation of the GIL system components. The underground tunnel included under Alternative 5 would be installed using a tunnel boring machine (TBM). For tunneling below the groundwater level without dewatering, pressurized-face TBMs would be used to stabilize the tunnel face and prevent water intrusion. For construction of the tunnel associated with Alternative 5, one of the following two types of TBMs would be employed: a Slurry Pressure Balance (SPB) TBM, or an Earth Pressure Balance (EPB) TBM, both of which are described below.

- **Slurry Pressure Balance TBM.** Excavation by an SPB machine supports the tunnel face using a pressurized bentonite slurry mix within the cutter head. The slurry and excavated muck mixture is pumped through slurry lines from the tunnel face, back through the completed tunnel, and then up to the surface work area to a separation plant equipped with a shaker and cyclone to separate sand, gravel, and silt from the slurry. The slurry is recycled back into the system and the sand, gravel, and silts are transported to appropriate disposal sites. SPB machines can also be fitted with a stone crusher in the cutter head to allow tunneling through soils with intermittent cobbles and boulders.
- **Earth Pressure Balance TBM.** Excavation by EPB machine supports the tunnel face by pneumatically pressurizing the excavated soil (muck) within a chamber behind the cutter head. Muck is removed from the chamber by a screw conveyor and then transported out of the tunnel by means of a conveyor belt

and/or muck cars on rails. As the boring machine proceeds, the concrete tunnel sections are put into place until a fully supported tunnel has been constructed. For a water-tight tunnel, where the tunnel is below the water table, the annular space on the exterior of the tunnel may be filled with cement grout.

Because tunnel infrastructure would be installed as the tunnel boring progresses, a large marshalling yard (estimated to be 20 to 30 acres in size) would need to be established as close to the boring site as possible for the storage of all electrical components and specialized materials associated with the GIL system. Due to the specificity of GIL system components and the time required for the manufacturer(s) to produce all required materials, the manufacturer(s) would not be able to maintain the desired construction schedule, in terms of producing materials as they are needed. Therefore, all materials would be acquired and stored at the marshalling yard prior to the start of construction.

In addition to the marshalling yard, an electrical component assembly area would be constructed at the boring site (Eastern Transition Station) in order to clean and prepare electrical components prior to lowering them into the tunnel for installation. Other equipment associated with tunnel boring activities would include cranes, loaders, and custom transport vehicles to remove excavated material. As with the access shafts, all excavated material would be transported off-site for disposal at approved facilities.

When the tunnel boring is complete, it is expected that the TBM would be abandoned underground, west of the western access shaft and chamber.

GIL System Installation

As previously described, the pipe enclosure that would house each GIL configuration would be installed in segments with a minimum length of 60 feet each. Each 60-foot pipe section would have a female connector on one end and a male connector on the other end, which are used to assemble the pipe sections and accommodate axial movement of the center conductor (as related to thermal expansion and contraction). Once the pipe sections and enclosed GIL components are in place within the underground tunnel, the pipe sections would be welded together to form a gas-tight seal.

2.5.2.1 Construction Equipment and Workforce

Construction equipment and workforce needs for Alternative 5 would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-11 through 2.2-17 (located at the end of Chapter 2); however additional equipment and workforce, beyond that provided in Table 2.2-18 for Segment 8, would be required for constructing the approximately 3.5-mile underground section between S8A MP 21.9 and 25.4. For access shaft construction, it is anticipated that approximately 10 to 20 workers would be required at each shaft site. For ventilation shaft construction, which is expected to be completed utilizing more conventional excavation methods, it is anticipated that approximately 10 to 15 workers would be required at each shaft site. The tunnel construction workforce would be on the order of approximately 30, including engineers, construction managers, miners, etc. Equipment that may be used for work associated with the construction of the access shafts, ventilation shafts, and underground tunnel would include haul trucks and dump trucks for removal of muck and delivery of materials, TBM, conveyor, rail cars (muck train), hoist systems (to remove material from the tunnel), cranes, and excavators. Additional equipment and workforce requirements would be determined as part of final engineering.

The estimated equipment and workforce needs for the substation elements for Alternative 5 would be identical to the proposed Project and are provided in Tables 2.2-19 through 2.2-25 (located at the end of Chapter 2).

2.5.2.2 Land Disturbance

Land disturbance associated with Alternative 5 would be identical to the proposed Project for Segments 4, 5, 6, 7, 10, and 11 as detailed in Tables 2.2-2 through 2.2-8 (located at the end of Chapter 2); however the surface land disturbance within Segment 8 would differ as a result of undergrounding an approximately 3.5-mile section between S8A MP 21.9 and 25.4. Along the underground portion, 15 220-kV LSTs that would otherwise be replaced with 4 500-kV double-circuit LSTs (S8A MP 21.9 to 22.85) and 11 500-kV double-circuit TSPs (S8A MP 22.85 to 25.4) as part of the proposed Project would remain in place; therefore, the surface land disturbance associated with these activities would be eliminated. Alternatively, new aboveground structures, such as dead end structures, transition stations, and ventilation shafts would increase the land disturbance both during construction and permanently. Table 2.5-1 (located at the end of Chapter 2) provides an estimate of the surface land disturbance associated with Segment 8 for Alternative 5. The estimated land disturbance associated with substation construction would be identical to the proposed Project for Alternative 5 as described in Section 2.2.12.14 above and provided in Table 2.2-10.

2.5.2.3 Hazardous Material Usage and Waste Generation

Hazardous Materials Usage

Insulating gases. For the GIL system, insulating gases would be composed of ~~40 percent Nitrogen (N_2) and 60~~ 100 percent Sulfur Hexafluoride (SF_6). ~~These~~This gas~~es~~ is~~are~~ not toxic; however, ~~they are~~it is considered an asphyxiant~~s~~. Therefore, displacement of oxygen for the workers in the tunnel (confined space) as a result of a leak would be an issue. In addition, SF_6 is a known greenhouse gas. In designing a SF_6 system, the usual practice is to limit the gas segments to approximately 1,000 pounds of gas; therefore, it is assumed that the maximum release of SF_6 would be the failure of a gas section (SCE, 2008d). Furthermore, SCE typically specifies a maximum annual loss of 0.1 percent when SF_6 equipment is ordered (SCE, 2008d). In the event of a failure of a gas segment, oxygen sensors would indicate an environment that could not sustain life and would activate the life support ventilation system to exchange the air within the tunnel (SCE, 2008d). In addition, workers would be provided breathing packs to allow a safe exit from the tunnel should there be a release of SF_6 gas.

Waste Generation

Waste generated as part of Alternative 5 would be identical to the proposed Project, as provided in Tables 2.2-26 to 2.2-32 (located at the end of Chapter 2), with the exception of Segment 8. Those elements of Alternative 5 contributing to additional waste generation within Segment 8, specifically associated with underground construction, are described below. The estimated waste generation associated with substation construction would be identical to the proposed Project for Alternative 5 as described in Section 2.2.12.15, above, and Tables 2.2-34 to 2.2-39 (located at the end of Chapter 2).

Transition Stations. While grading plans have not been prepared for the two transition stations, it is assumed that grading would be performed in order to prepare a reasonably flat site for the transition stations. The transition stations would be design to optimize cut and fill minimizing import/export requirements to the extent feasible.

Underground Tunnel. Excavation of the underground tunnel, which would be approximately 18-feet in diameter, would require the removal of at least 176,500 cubic yards of soil and rock (SCE, 2008d). The

concrete required for the assumed one-foot thick tunnel liner would be a minimum of 37,000 cubic yards (SCE, 2008d).

Vertical Access Shafts. As shown in Figure 2.5-5, the Eastern Transition Station access shaft would be approximately 100 feet deep and the Western Transition Station access shaft would be approximately 420 feet deep, requiring the removal of at least 28,900 cubic feet of soil and rock (SCE, 2008d). The concrete required to line the shaft to a thickness of one foot would be a minimum of 3,600 cubic yards (SCE, 2008d).

Ventilation System Shafts. Excavation of the three ventilation shafts identified in Figure 2.5-5, assuming an outside diameter of 20 feet, would require the removal of at least 2,500 cubic feet of soil and rock (SCE, 2008d). The minimum amount of concrete required to line the ventilation shafts to a thickness of one foot would be at least 760 cubic yards (SCE, 2008d). Final sizing of the shafts will be determined by the configuration of stairs and possibly an elevator.

2.5.2.4 Construction Schedule

The following construction schedule information is based upon reasonable engineering assumptions and typical construction activities, as detailed engineering has not been performed. It is assumed that the underground portion of Alternative 5, including tunnel excavation, liner installation, line installation, transition stations, and the ventilation system would be constructed concurrently over a 24 month period. The major construction stages would involve the following:

- Initial preparation of the transition stations for construction. These activities would include:
  - Grading to prepare a level site suitable for construction, including installation of retaining walls to limit the overall dimensions of the sites; and
  - Installation of work surfaces for the tunnel construction activities.
- Installation of temporary power to support the access shaft and tunnel excavation activities.
- Excavation of the access shafts.
- Design, delivery, and installation of the boring machine.
- Excavation of the tunnel.
- Excavation of the ventilation shafts.
- Final preparation of the transition stations for construction. These activities would include:
  - Construction of foundations;
  - Construction of the line dead-end racks;
  - Construction of open concrete trenches for placing the SF_6 bus below finished grade, where the trenches would be covered with open metal grating;
  - Construction of control buildings for operation of the facility;
  - Installation of emergency generators; and
  - Construction of distribution feeders for station light and power, where feeders would likely be required at each transition station and at all ventilation shafts.
- Installation of the GIL system in the tunnel and on the surface within the open trenches. This activity includes placing the GIL system on supports within the tunnel and in the surface trenches, excavation of the N_2 gas that was placed in the GIL sections for shipping and introduction of SF_6 insulating gas into the GIL sections.

- High voltage testing of the GIL system.

Construction of all other elements of the TRTP would be identical to the proposed Project as discussed in Section 2.2.12 and detailed in Table 2.2-43 located at the end of Chapter 2.

2.5.3 Alternative 5 Operations and Maintenance

Operations and maintenance of Alternative 5 would be the same as the proposed Project, with the exception of the underground components, as discussed below.

GIL System Operation. During operations, the GIL system components and underground infrastructure would be monitored remotely using the monitoring systems described in Section 2.5.1. Maintenance personnel would enter the tunnel to visually inspect GIL system infrastructure and/or conduct system repairs as determined necessary based on irregularities or abnormalities detected by the monitoring systems after project construction.

Access and Ventilation Shafts. During operations it is expected that the access and ventilation shafts would be monitored for groundwater intrusion to ensure integrity of the walls and minimize the potential for tunnel flooding.

2.5.3.1 Operational Reliability Considerations

Reliability considerations associated with the proposed underground infrastructure are primarily related to the lack of precedence in installing GIL systems of the length and voltage proposed under Alternative 5, and with the predicted magnitude of impact that would occur to the overall electrical system should the underground segment fail or be fatally interrupted once it is in operation. SCE has previously used GIL apparatus in some 500/220 kV or 500/115 kV substations; however, with these past installations, all components of the GIL system have been located above grade or in open trenches where there is no significant access issue. Two of the largest high-voltage GIL systems that are currently known of include the Shinmeika-Tohai Line in Japan, a 2.2-mile 275-kV double-circuit installation, and the Wehr Pumped Storage Project in Germany, which included one 0.38-mile and one 0.44-mile 420-kV double circuit installation. In comparison, the proposed underground segment of Alternative 5 is of higher voltage (500 kV) and is substantially longer than both of these case studies. As such, although construction and operational methodologies employed under Alternative 5 have proven to be successful in the past, the combined length and voltage of this underground segment is as of yet unprecedented.

It is reasonably expected that should a system failure occur on the underground portion of Alternative 5 after the transmission line is in operation, the result would have substantial effects on the entire electrical system connected to Segment 8A. Failure of underground infrastructure could occur through natural events such as an earthquake, through manufacturer defects, or through human error during installation and/or maintenance. In the case of a failure, the entire line would be removed from service until the failure is identified and repaired. While the line is out of service, SCE would accommodate load by re-distributing power from other sources and/or by purchasing additional power locally. Rolling black-outs may also result if available power is not able to satisfy load while the damaged line is out of service.

A number of steps would be required to repair damage to the underground infrastructure associated with Alternative 5. Whether damage occurs to the underground tunnel or directly to the GIL components, the first step would be to identify the location of the damage. For damage to the GIL components, it would be possible to identify, through the process of elimination, the phase on which the failure occurred. Part of this process of

elimination would include testing of the insulating gas for impurities. Following are some of the basic steps that would be expected to occur, should a fault or rupture occur on the GIL tube enclosure or other GIL components (SCE, 2008c, DR#5-11):

- Determine if the integrity of the pipe enclosure has been compromised and if compromised, determine whether fault by-products have contaminated the tunnel. If the tunnel has been contaminated, conduct decontamination procedures.
- Locate the damaged GIL section (It is critical to identify the point of damage as soon as possible in order to determine what sort of repairs are necessary and to protect surrounding underground infrastructure, as damage on a GIL would typically travel along the line, expanding from the initial damage).
- Recover as much SF6 gas as possible from the damaged section (ideally, any escaped gas would be confined within one or more of the "gas safety compartments").
- Remove and replace the faulted GIL components, including phases and conductors (this process could reasonably take weeks to months, depending on the extent of the damage, as well as how long it takes the manufacturer to produce replacement materials). Dispose of the fault by-products using approved disposal methods. Clean the mating surfaces of the adjacent gas sections to remove any remaining contamination.
- Evacuate the gas section using a vacuum process to remove all air and moisture, then re-fill the gas section with clean SF6 insulating gas.
- Test the gas section to verify its electrical integrity prior to returning the circuit to service.

As mentioned, damage to underground infrastructure could potentially occur due to seismic events. Although past evidence regarding the seismic-induced failure of a GIL system of this size is unavailable to make a statistically-supported conclusion regarding seismic risk (due to the lack of comparable past projects), it is reasonably assumed that an underground tunnel and GIL system would be more susceptible to seismic-induced failure than would an overhead transmission system. Additionally, if an underground GIL system were to be disturbed during an earthquake, it is likewise expected that insulation or structure damage would be likely to occur. In areas where the GIL system included under Alternative 5 would be situated near a fault, it is expected that project design would include a wider tunnel width to provide for access to the GIL components for repairs in case of tunnel or insulator damage.

2.5.3.2 Alternative 5 – Forest Service Permits and Plan Amendments

Requirements for Forest Service Permits and Plan Amendments would be identical to those described for Alternative 2 (see Section 2.2.14).

2.6 Alternative 6: Maximum Helicopter Construction in the ANF Alternative

This alternative was requested by the Forest Service to reduce ground disturbance within the ANF by minimizing new road construction through the use of helicopter construction. This alternative was initially conceived in June/July 2008 following the completion of the Alternatives Screening Report; therefore, it is not included in Appendix A.

2.6.1 Alternative 6 Description

This alternative would utilize helicopter construction within the ANF to the maximum extent feasible. Potential helicopter staging and landing areas, specifically medium- to large-sized sites required for materials storage and tower assembly when constructing by helicopter ~~assembly and materials storage~~ (see description of these sites in Section 2.2.12.2, Staging and Support Areas), have been identified within the vicinity of Segments 6 and 11 to facilitate helicopter construction within the ANF. All the locations appear to have existing access roads to them or within close proximity and should be accessible for the delivery and staging of materials, equipment, and personnel. Candidate helicopter construction staging/support areas, which are assumed to be approximately 4 acres in size (on average) although the size could range substantially depending on the land available and intended uses, preliminarily identified along Segments 6 and 11 would be located as shown in Figure 2.6-1 and as described in Table 2.6-1 (located at the end of Chapter 2) and detailed below:

(1) West of Angeles Forest Highway at the intersection with Mount Emma Road, east of S6 MP 3.0;

(2) South of Aliso Canyon Road and east of an existing SCE access road, east of S11 MP 3.75 (off NFS lands – located on a private in-holding within the ANF);

(3) South of Aliso Canyon Road and east of Price Ranch Road, in between Segments 6 and 11;

(4) Along south side of a non-Forest system road, near where road ends; approximately 0.15 mile north of Mt. Gleason Road, approximately 1.7 miles west of S11 MP 7.8;

(5) Near Forest Road 4N18, adjacent and west of S6 MP 9.75;

(6) Adjacent and west of Upper Big Tujunga Canyon Road, approximately 0.25 to 0.30 mile west of S6 MP 14.0;

(7) Accessed via Barley Flats Road, approximately 1.8 miles west of S6 MP 16.75 (Same as SCE#6B);

(8) Terraced area near Big Tujunga Dam, approximately 0.15 mile west-southwest of Big Tujunga Canyon Road and S11 MP 14.5 (Same as SCE#3B);

(9) Adjacent to Rincon-Redbox Road in the Newcomb Pass area, approximately 0.36 mile west of junction with Shortcut-Edison Road, just west of S6 MP 19.5 (Same as SCE#7);

(10) Adjacent to the north of Angeles Forest Highway, approximately 0.25 north of intersection with Big Tujunga Canyon Road, 0.8 mile east of S11 MP 13.25; ~~and~~

(11) West of Van Tassel Road, north of Duarte, west of S6 MP 26 (Same as SCE#8); ~~.~~

(12) A large roadside turnout area adjacent to Angeles Forest Highway north of Mill Creek Summit Station, east of S6 MP 6.6; and

~~(11)~~(13)An existing helicopter landing area southeast of Mill Creek Summit Station, east of S6 MP 7.5.

Note: List numbering corresponds to identification numbers shown in Figure 2.6-1.

Table 2.6-1 (located at the end of Chapter 2) provides a detailed overview of each candidate helicopter construction staging/support area or marshalling yard, including a description of the site, approximate size, and necessary improvements. Smaller landing areas generally used for personnel drop-off/pick-up, emergency landing, and construction landing pads require substantially less acreage. As such sites are considered to be

abundant throughout the ANF, siting of these helicopter sites was not considered a limiting factor in developing this alternative. Examples of such sites may include road pull-outs, ANF facility parking lots, and other previously disturbed areas. Same as SCE's proposed Project, it has been assumed that two support yards (100-feet by 100-feet) would be utilized per staging area and that a landing pad (40-feet by 40-feet) would be required for each tower constructed by helicopter (see description in Section 2.2.12.2). The siting of these smaller helicopter staging areas would be conducted with the input of the helicopter contractor, and affected private landowners and land management agencies, such as the Forest Service, during final engineering.

Due to the substantial weight of the loads to be carried by the helicopters (namely sky cranes), and limitations on the quantity of fuel carried by each helicopter, only those towers located within an approximately 2.5 mile radius of the helicopter staging areas were considered to be candidates for helicopter construction. All towers within these zones located within the ANF on NFS lands have been assumed to be helicopter constructed for the purposes of this alternative. Those towers which fell within the 2.5 mile radius, but were located outside of the ANF (at the north end near Vincent Substation) were not included in this alternative as there is a well established existing roadway network to allow for ground-based construction. Furthermore, outside of the ANF there are fewer restrictions with respect to the use of the existing roadways, unlike within the ANF where use of USDA Forest Service roads must be in compliance with Operational Maintenance Levels (OMLs) and other requirements of the Angeles National Forest 2005 Land Management Plan.

A total of 148~~3~~ new 500-kV towers would be constructed by helicopter under this alternative, 92~~87~~ within Segment 6 and 56 within Segment 11. As a result of helicopter construction, approximately 42 miles (±15% range of 49 to 36 miles) of new and upgraded access and spur roads (includes new, reconstruction, and maintenance road types), which would be required as part of SCE's proposed Project (Alternative 2), would not be created or upgraded for ground access to the helicopter constructed towers. However, ground-access to wire stringing sites (pulling/tensioner/splicing) would continue to be required for this alternative as equipment for these activities can only be brought in by truck. Similarly, as described in Section 2.2.12.5, for structure footings installed utilizing conventional footing construction, a tracked excavator may be required to dig the foundation holes, which would need to access the structure sites via a temporary trail or overland 'drive and crush', neither of which would require any grading; although, some minor brush clearing may be required if the vegetation is too dense to drive across (SCE, 2008j). Foundations would be installed using micropile methods as described in Section 2.2.12.5 (Tower and Pole Construction) to the maximum extent feasible, as determined by SCE in consultation with the Forest Service ~~for all helicopter constructed towers under this alternative~~ (see discussion below in Section 2.6.2), and a tracked excavator would not be used as it lacks the necessary precision. Instead, a portable drill rig would be ~~flown in~~utilized for installation of micropile foundations.

The roads within the ANF that would be utilized for Alternative 6 compared to SCE's proposed Project (Alternative 2, which is also the same for Alternatives 3, 4, 5, and 7) are shown in Figure 2.6-1. As shown, this alternative would result in not only fewer roads being created and/or upgraded as compared to SCE's proposed Project but would also result in less land disturbance associated with those roads that would be utilized (see land disturbance discussion in Section 2.6.2.2). Furthermore, spur roads created during construction to provide access to ground-based constructed towers would be considered temporary under Alternative 6 and would be revegetated upon completion of construction, whereas under Alternative 2 spur roads to towers within the ANF would be permanent.

The access roads in the ANF that would need improvement under the proposed Project (Alternative 2) but not under the Maximum Helicopter Construction in the ANF Alternative (Alternative 6) include the following

(Note: This list does not include the miscellaneous spur roads required under Alternative 2, which would not be required under Alternative 6):

Segment 6:

Non-forest system access road from roughly S6 MP 1.4 to 1.6

Non-forest system access road from roughly S6 MP 3.0 to 4.5

3N23 (Monte Cristo Creek) from roughly Angeles Forest Highway to S6 MP 10.7

4N18.2 (Lynx Gulch) from roughly Big Tujunga Road to S6 MP 12.0

3N20 (Powerline Road) from roughly S6 MP 13.6 to 15.2

2N23 (Shortcut Edison) from roughly S6 MP 18.2 to S6 MP 19.9

~~2N25.2 (West Fork/Cogswell Road) from roughly S6 MP 20.2 to Cogswell Reservoir~~

Segment 11:

Non-forest system access road from roughly S11 MP 1.5 to 2.6

4N24.1 (Edison) from roughly S11 MP 4.0 to 6.0

3N27 (Edison/Fall Creek) from roughly S11 MP 12.0 to Tujunga Canyon Road

2N75 (CCC Ridge) from roughly S11 MP 16.7 to Highway 2

Alternative 6 would be identical to the proposed Project (Alternative 2) with respect to Segments 4, 5, 7, 8, and 10 as discussed in Sections 2.2.3 through 2.2.5, 2.2.8, and 2.2.9. All substation and information technology facilities would also be identical to the proposed Project as discussed in Sections 2.2.10 and 2.2.11, respectively.

2.6.2 Alternative 6 Construction

Construction of Alternative 6 would be generally be the same as the proposed Project as discussed in Section 2.2.12; however, there would be a substantial increase in the amount of helicopter construction within Segments 6 and 11 and foundations would be installed utilizing micropiles, as described below.

For SCE's proposed Project (Alternative 2), the majority of towers would be constructed using road-based construction; although, SCE has estimated that approximately 33 towers would be constructed by helicopter (17 in Segment 6 and 16 in Segment 11). As noted above, this alternative assumes a total of 148~~3~~ new 500-kV towers would be constructed by helicopter.

SCE provided estimates of the minimum and maximum number of helicopter round trips required for each activity (wreck-out, construction, or stringing conductor) by structure type, as follows (SCE, 2008a; SCE 2008c – DR#5: Q5-14):

- The minimum number of helicopter trips required to wreck out a 220-kV single-circuit tower would be approximately 55 for suspension towers and 64 for dead-end towers, and the maximum estimated number of trips would be 89 for suspension towers and 105 for dead-end towers; and
- The minimum number of helicopter trips required to construct a 500-kV single-circuit tower would be approximately 146 for suspension towers and 380 for dead-end towers, and the maximum estimated number of trips would be 194 for suspension towers and 480 for dead-end tower.

Based on the above assumptions, and as shown in Table 2.6-2 (located at the end of Chapter 2) it has been estimated that a minimum of 19,817 ~~18,459~~, and a maximum of 27,724 ~~25,829~~ helicopter round trips would

be required to complete Segment 6, which is substantially more trips than would be required under SCE's proposed Project (min. 3,417; max. 4,811); and a minimum of approximately 11,577 and maximum of 16,185 helicopter trips would be required to complete Segment 11, which is substantially more trips than would be required under SCE's proposed Project (min. 3,216; max. 4,528). It should be noted that the number of trips would vary due to other factors, such as distance, weather, altitude, site conditions, etc.

To accommodate the amount of helicopter construction required within the ANF and to reduce extending the schedule more than is absolutely necessary for these activities, nighttime construction may be implemented. Nighttime construction activities within the ANF would require the approval of the Forest Service.

Alternative 6 would use micropile foundations for construction of footings for all ~~helicopter constructed~~ towers where SCE, in consultation with the Forest Service, determines that the technique is feasible, as described in detail in Section 2.2.12.5 (Tower and Pole Construction – Foundations). Micropile equipment would access the sites via helicopter or road. ~~This would avoid roads not needed for cranes and other ground based construction equipment having to be used for conventional footing installation.~~ If site-specific conditions prevent the use of micropile foundations, then conventional footing construction would be used.

2.6.2.1 Construction Equipment and Workforce

Construction equipment and workforce needs for Alternative 6 would be identical to the proposed Project for Segments 4, 5, 7, 8, and 10 as detailed in Tables 2.2-11 through 2.2-14, 2.2-17, and 2.2-18 (located at the end of Chapter 2); however additional equipment and a specialized workforce would be required for helicopter wreck-out and construction activities in Segments 6 and 11, in addition to that detailed in Tables 2.2-15 and 2.2-16 (located at the end of Chapter 2). As described in Section 2.2.12, typical helicopters used within the Electrical Utility Industry for construction-related activities include (SCE, 2007b – DR#1: Q005):

- Boeing 234 UT (Max. certified external load of 28,000 lbs.)
- Erickson S-64/Sikorsky S-64F (Max. certified external load of 25,000 lbs.)
- Sikorsky S-64E (Max. certified external load of 20,000 lbs.)
- Boeing 107II (Max. certified external load of 11,500 lbs.)
- Kamov KA 32 (Max. certified external load of 11,000 lbs.)
- Sikorsky S-61S (Max. certified external load of 10,000 lbs.)
- Eurocopter 332 C/L (Max. certified external load of 8,800 lbs.)
- MIL MI 17 (Max. certified external load of 8,600 lbs.)
- Sikorsky S-61L (Max. certified external load of 8,600 lbs.)
- Bell 214B (Max. certified external load of 8,000 lbs.)
- Eurocopter 330J (Max. certified external load of 7,300 lbs.)
- MIL MI 8 (Max. certified external load of 6,600 lbs.)
- Sikorsky S-58T (Max. certified external load of 5,000 lbs.)

The estimated equipment and workforce needs for the substation elements for Alternative 6 would be identical to the proposed Project and are provided in Tables 2.2-19 through 2.2-25 (located at the end of Chapter 2).

2.6.2.2 Land Disturbance

Land disturbance associated with Alternative 6 would be identical to the proposed Project for Segments 4, 5, 7, 8 and 10 as detailed in Tables 2.2-2 through 2.2-5, 2.2-8 and 2.2-9 (located at the end of Chapter 2); however, the surface land disturbance within Segments 6 and 11 would differ as a result of additional helicopter construction activities and the revegetation of spur roads upon completion of construction (i.e., spur roads become a temporary impact rather than a permanent impact as proposed for Alternative 2). Tables 2.6-3 and 2.6-4 (located at the end of Chapter 2) provide an estimate of the surface land disturbance associated with Segments 6 and 11, respectively, for Alternative 6.

As shown in these tables, the type of land disturbance associated with Alternative 6 is expected to be comparable to SCE's proposed Project (Alternative 2), although there would be a noticeable reduction in the acreage of land disturbance as a result of the reduction in new access and spur roads and upgrades to existing roads (approximately 42.5 miles with a ±15% range of 49 to 36 miles), and a reduction in the acreage of land disturbance associated with ground-based construction. For SCE's proposed Project (Alternative 2), construction within Segment 6 on NFS lands would result in a total of approximately 132 ~~127~~ acres of disturbance during construction (±15% range of 112-152 ~~108-147~~ acres) and approximately 554 acres of permanent disturbance (±15% range of 46-632 acres) (see Table 2.2-7 at the end of Chapter 2), whereas for Alternative 6, construction within Segment 6 on NFS lands would result in a total of approximately 903 acres of disturbance during construction (±15% range of 77-104 ~~79-107~~ acres) and approximately 286 acres of permanent disturbance (±15% range of 24-32 ~~22-30~~ acres) (see Table 2.6-4 at the end of Chapter 2). For SCE's proposed Project (Alternative 2), construction within Segment 11 on NFS lands would result in a total of approximately 136 ~~144~~ acres of disturbance during construction (±15% range of 115-156 ~~123-166~~ acres) and approximately 55 acres of permanent disturbance (±15% range of 46-63 ~~47-64~~ acres) (see Table 2.2-6 at the end of Chapter 2), whereas for Alternative 6, construction within Segment 11 on NFS lands would result in a total of approximately 105 ~~110~~ acres of disturbance during construction (±15% range of 89-121 ~~94-126~~ acres) and approximately 376 acres of permanent disturbance (±15% range of 31-421 acres) (see Table 2.6-3 at the end of Chapter 2).

Overall, within Segments 6 and 11, Alternative 6 would reduce land disturbance during construction by approximately 862 acres (±15% range of 73-99 ~~70-95~~ acres) and permanent land disturbance by approximately 467 acres (±15% range of 39-53 ~~40-54~~ acres) compared to SCE's proposed Project (Alternative 2). Specifically on NFS lands, Alternative 6 would reduce land disturbance during construction by approximately 72 ~~69~~ acres (±15% range of 61-83 ~~59-79~~ acres) and permanent land disturbance by approximately 457 acres (±15% range of 38-51 ~~40-54~~ acres) compared to SCE's proposed Project (Alternative 2).

The estimated land disturbance associated with substation construction would be identical to the proposed Project for Alternative 6 as described in Section 2.2.12.14 above and provided in Table 2.2-10.

2.6.2.3 Hazardous Material Usage and Waste Management

As discussed in Section 2.2.12.15 for the proposed Project, construction of the Project would require limited use of hazardous materials, such as fuel, lubricants, and cleaning solvents; although, for Alternative 6 a greater amount of aviation fuel would be required compared to the proposed Project given the substantial number of structures to be constructed by helicopter (see Appendix C, Air Pollutant Emissions Calculations for specific fuel quantity assumptions for all alternatives). All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the construction phase SWPPP(s) for the T/L

segments and substation components. The Forest Service has indicated that hazardous materials storage within the ANF (on NFS lands) would be limited to the minimum number of locations necessary to complete construction. SCE must obtain Forest Service approval of hazardous materials storage locations prior to construction.

Similar to the proposed Project, waste generated as part of Alternative 6 would include soil/vegetation, sanitation, wood, concrete, copper, steel, etc.

2.6.2.4 Construction Schedule

Construction of Alternative 6 would be identical to the proposed Project, as shown in Table 2.2-43 (located at the end of Chapter 2), with the exception of Segments 6 and 11, where the need for substantial helicopter construction may result in a longer construction schedule due to the limited availability of specialized helicopters (There is a limited number of sky cranes that can perform this type of work in the world) and personnel (Only one entity currently provides the proprietary mechanism that allows the installation of transmission structures by helicopter and restrictions on allowing personnel to work under a hovering helicopter). The schedule for helicopter construction would be finalized as part of final engineering.

2.6.3 Alternative 6 Operations and Maintenance

Operations and maintenance of the T/Ls and substations under Alternative 6 would be the same as the proposed Project, as described in Section 2.2.13 above, except within Segments 6 and 11. As stated for the proposed Project (Alternative 2), SCE would operate and maintain all of the components of the Project in accordance with existing SCE procedures and terms and conditions of authorizations. No additional personnel would be required for operations and maintenance of the new T/L, substation, and telecommunications infrastructure (SCE, 2007b – DR#1: Q006). Operations and maintenance of the 500-kV and 220-kV T/Ls would involve periodic inspection approximately once per year via helicopter and/or truck, although a greater amount of helicopter inspection may result due to the number of towers under Alternative 6 that would not be accessible by truck, as fewer permanent spur roads would be constructed resulting in the need to walk to towers for inspection purposes or access by helicopter. This would be most similar to the No Project/Action Alternative, where the existing towers are currently inspected via helicopter as spur roads have not been maintained and ground access by vehicle is no longer available to many of the towers within the ANF. Maintenance would be performed on an as-needed basis, including maintenance of the access roads and erosion/drainage control structures (SCE, 2007b – DR#1: Q006). Preventative maintenance of telecommunications equipment would be scheduled approximately every six months to ensure system reliability and performance (SCE, 2007b – DR#1: Q006). General operations and maintenance activities within the ANF would occur according to the terms and conditions ~~be allowed as part~~ of the Special Use authorization to be issued by the Forest Service for the Project (see Section 2.6.4 below); however, more extensive maintenance determined by an authorized officer to be outside the scope of approved operation and maintenance plans ~~drainage repairs, for example,~~ would require additional approvals/permits from the Forest Service. This level of maintenance may include but is not limited to: drainage repairs, replacement of tower components, or additional slope stabilizations measures undertaken after construction. Operation and maintenance activities on the ANF are expected to change little from what is currently occurring. ~~as it is considered reconstruction. Long-term access needs in the ANF for operations and maintenance would be addressed after construction through an update of existing road permits. Herbicide use to control invasive vegetation would also occur under Alternative 6. Vegetation management requirements would be the same as for the Alternative 2, with lesser level of vehicle access to perform this work.~~

2.6.4 Alternative 6 – Forest Service Permits and Plan Amendments

As described for the proposed Project (Alternative 2) in Section 2.2.14, above, implementation of Alternative 6 would require the issuance of a 50-year term Special Use authorization by the Forest Service. This Special Use authorization would authorize the construction, maintenance, and use of approximately 42.25 miles (21.85 miles in Segment 6 and 20.4 miles in Segment 11) of improvements (500-kV T/Ls along with ancillary improvements) within two existing T/L ROWs on NFS lands within the ANF (same as Alternative 2). Ground disturbing activities or other uses of NFS lands that would occur during construction located outside of the existing ROW width would be included in the Special Use authorization. Additional resource review may be needed prior to issuing this authorization. Furthermore, ~~several~~Project-specific 2005 Forest Plan amendments would be required including (1) modifying Forest Standards S9 and S10 specifically for the Project (related to meeting ~~the~~ Scenic Integrity Objectives on NFS lands) ~~along the proposed route through the ANF~~, as described in Table 2.6-5 (located at the end of Chapter 2); ~~(2) modifying the Forest Standard related to the Pacific Crest Trail (S1) specifically regarding this alternative, as described above in Section 2.2.14 (same as Alternative 2);~~ and (2~~3~~) modifying the Riparian Conservation Area Standards for those riparian conservation areas (RCAs) adversely impacted by Alternative 6, as shown in Table 2.6-6 (located at the end of Chapter 2). Alternative 6 would decrease the number of RCAs being adversely impacted compared to SCE's proposed Project (Alternative 2) by nearly one-half (~~57~~ 58 versus 95)~~, thereby requiring fewer amendments to the 2005 Forest Plan~~.

2.7 Alternative 7: 66-kV Subtransmission Alternative

This alternative is comprised of ~~three~~four 66-kV subtransmission line elements, including the following: (1) Undergrounding the existing 66-kV subtransmission line in Segment 7 through the Woodland Duck Farm / River Commons at the Duck Farm Project (Duck Farm Project) between Valley Boulevard (S7 MP 8.9) and S7 MP 9.9 as requested by the Board of Supervisors County of Los Angeles to minimize the Project's effects to passive recreation opportunities in the planned Duck Farm Project area; (2) Re-routing and undergrounding the existing 66-kV subtransmission line around the Whittier Narrows Recreation area in Segment 7 (S7 MP 11.4 to 12.025) to provide habitat enhancement for least Bell's vireos, as identified by SCE; (3) Re-routing the existing 66-kV subtransmission line through the Whittier Narrows Recreation Area in Segment 7 (S7 MP 12.0 to 13.6) immediately north of the existing 220-kV ROW to reduce the number of structures required (50-foot expanded ROW required); and (4~~3~~) Re-routing the existing 66-kV subtransmission line around the Whittier Narrows Recreation Area in Segment 8A between the San Gabriel Junction (S8A MP 2.2) and S8A MP 3.8 to provide habitat enhancement for least Bell's vireos, as identified by SCE.

2.7.1 Alternative 7 Description

Duck Farm 66-kV Underground (Segment 7)

This element of Alternative 7 would consist of undergrounding the Rio Hondo-Amador-Jose-Mesa 66-kV subtransmission line along Segment 7 through the River Commons or Duck Farm Project, as shown in Figure 2.7-1. Beginning at the north side of Valley Boulevard (Structure 43) located at approximately S7 MP 8.9, the 66-kV subtransmission line would be placed underground along the west edge of the ROW for a distance of approximately 6,000 feet to just south of Structure 48 (S7 MP 9.9), at which point the 66-kV subtransmission line would transition aboveground and continue overhead to Peck Road, as proposed under Alternative 2

(SCE's Proposed Project). Approximately 14 fewer 66-kV LWSPs would be required as a result of undergrounding the 66-kV subtransmission line through the Duck Farm Project.[6]

Whittier Narrows 66-kV Underground Re-Route (Segment 7)

This element of Alternative 7 would consist of re-routing and undergrounding the Jose-Mesa 66-kV subtransmission line around the Whittier Narrows Recreation area in Segment 7, as shown in Figure 2.7-2. Beginning at Peck Road (S7 MP 11.4) the 66-kV subtransmission line, which under SCE's Proposed Project (Alternative 2) would be re-located to the western edge of the ROW, would leave the existing ROW at Peck Road and be placed underground. The new underground 66-kV subtransmission line would proceed approximately 300 feet north along Peck Road, then turn west and continue on Durfee Road for approximately 3,000 feet before rejoining SCE's proposed alignment (Alternative 2) at S7 MP 12.025 (just north of Structure 58). Approximately eight fewer 66-kV LWSPs would be required as a result of undergrounding the 66-kV subtransmission line~~ through the Duck Farm Project~~.[7]

Whittier Narrows 66-kV Overhead Re-Route (Segment 7)

This element of Alternative 7 would consist of relocating the existing Rio Hondo – Amador – Jose – Mesa 66-kV subtransmission line to the north side of the existing 220-kV ROW beginning at Durfee Avenue (~S7 MP 12.0) through Legg Lake Park and the Whittier Narrows Recreation Area to just east of San Gabriel Boulevard (~S7 MP 13.6). A 50-foot expansion of the existing ROW would be require between approximately S7 MP 12.7 (Legg Lake) and S7 MP 13.6 (just east of San Gabriel Boulevard). The expanded ROW would provide the additional clearance for conductor sway required by the new double-circuit 500-kV structures thereby allowing taller 66-kV LWSPs to be installed in a one-for-one configuration with the new 500-kV structures. As such, fewer, but taller, 66-kV structures would be required along this portion of the Segment 7 alignment compared to the proposed Project.

Whittier Narrows 66-kV Overhead Re-Route (Segment 8A – Option 1 and Option 2)

This element of Alternative 7 would consist of relocating two 66-kV circuits (Mesa-Narrows 66-kV and Walnut-Hillgen-Industry-Mesa-Reno 66-kV), approximately 1.63 miles of overhead 66-kV lines (x2 lines), and vacating the southern end of the existing Project ROW from San Gabriel Boulevard (just west of the San Gabriel Junction, S8A MP 2.2) to the east side of the San Gabriel River (S8A MP 3.8). The existing 66-kV subtransmission lines currently split at the San Gabriel Junction (S8A MP 2.2) with one line proceeding along the existing 220-kV ROW and the other line proceeding southwest along San Gabriel Boulevard. As such, between the San Gabriel Junction and Lincoln Avenue existing infrastructure would be utilized. As shown in Figure 2.7-2, these 66-kV circuits would be relocated beginning at the intersection of San Gabriel Boulevard and Lincoln Avenue and proceed southeast approximately 1,880 feet along San Gabriel Boulevard until Rosemead Boulevard, at which point the street name changes to Durfee Avenue. At this point two options exist for routing the 66-kV subtransmission lines back into the existing 220-kV ROW.

For Option 1, ~~T~~the 66-kV lines would continue for approximately 700 feet southeast across Durfee Avenue utilizing new LWSPs and then continue approximately 2,100 feet southeast along Siphon Road to the San Gabriel River ~~ and then utilize~~replacing the existing idle 66-kV structures with new TSPs. ~~which currently run southeast along Siphon Road to the San Gabriel River (approximately 2,100 feet).~~ New ROW, approximately

[6] Reduction of 66-kV infrastructure is based on SCE's proposed Project estimate of 150 66-kV structures (LWSPs and TSPs) along Segment 7. The overall length of 15.8 miles was reduced to remove those areas where there do not appear to be 66-kV relocations requested by SCE, including the one-mile segment between approximately S7 MP 10 and 11 and west of the San Gabriel Junction. (150 towers over 12.7 miles or approximately 12 poles per mile).

[7] Ibid.

1,600~~200~~-feet long and 60-feet wide, would be required to cross from the existing 66-kV ROW on the west side of the San Gabriel River to the existing 220-kV ROW located on the east side of the San Gabriel River (near Structure 9), thereby allowing the new 66-kV lines to tie back into the 66-kV lines within the Project ROW (S8A MP 3.8) completing the circuit. In Segment 8A, the two 66-kV lines would transition within the existing ROW to underground for approximately 200 feet across the width of the ROW from the south side and then rise up on the north side of the ROW to join the existing lines.

For Option 2, the 66-kV lines would continue east along the north side of Durfee Avenue for approximately 1,700 feet utilizing new LWSPs, re-entering the existing 220-kV ROW at approximately S8A MP 3.2. The 66-kV lines would continue southeast along the south side of the existing 220-kV ROW up to the east side of the San Gabriel River (S8A MP 3.8) utilizing new TSPs. A 20-foot expansion of the existing ROW between S8A MP 3.2 and 3.8 would be required to provide adequate clearance for conductor sway between the 66-kV lines and the new double-circuit 500-kV structures within the ROW and allow for one-of-one placement of the 66-kV TSPs alongside the new double-circuit 500-kV structures.

For Option 1, ~~A~~approximately eight new LWSPs and ten~~two~~ bolt based TSPs at either side of the channel crossing (14 ~~10~~ total) would be installed beginning at the intersection of Lincoln Avenue to Siphon Road (approximately 2,580 feet) and within the new approximately 1,600 ~~1,200~~-foot ROW at the San Gabriel River crossing (SCE, 2008h). These additional LWSPs would be installed to accommodate the new 66-kV subtransmission lines. ~~Within the existing approximately 2,100 foot 66 kV ROW along Siphon Road, if the existing idle 66 kV structures are found to be inadequate due to deterioration of the structures or due to engineering requirements with respect to wind loads (to be determined during final engineering), then additional LWSPs would be installed to accommodate the new 66 kV subtransmission lines.~~ While this 66-kV re-route would require approximately 14~~ten~~ new 66-kV poles (LWSPs and TSPs), approximately 1.63 miles of 66-kV line would be eliminated from the 220-kV ROW or approximately 20 66-kV LWSPs, resulting in a reduction of approximately six~~ten~~ 66-kV LWSPs that would otherwise be required by the proposed Project (Alternative 2).[8] For Option 2, it is assumed that a similar number of LWSPs and TSPs would be required as the route length and infrastructure required would be basically the same as Option 1.

Other than the minor 66-kV re-routes and underground construction described above for the ~~three~~four elements of Alternative 7, this alternative would be identical to the proposed Project (Alternative 2) as discussed in Sections 2.2.3 through 2.2.9. All substation and information technology facilities would also be identical to the proposed Project as discussed in Sections 2.2.10 and 2.2.11, respectively.

2.7.2 Alternative 7 Construction

Construction of Alternative 7 would generally be the same as the proposed Project as discussed in Section 2.2.12. General underground construction of 66-kV subtransmission lines is discussed in Section 2.2.12.9. Specifics associated with the underground elements of this alternative are described below.

Duck Farm 66-kV Underground (Segment 7)

Undergrounding of the existing 66-kV subtransmission line from approximately S7 MP 8.9 to 9.9 would be completed by traditional trenching and duct bank construction methods along the majority of the underground

[8] Reduction of 66-kV infrastructure is based on SCE's proposed Project estimate of 150 66-kV structures (LWSPs and TSPs) along Segment 7. The overall length of 15.8 miles was reduced to remove those areas where there do not appear to be 66-kV relocations requested by SCE, including the one-mile segment between approximately S7 MP 10 and 11 and west of the San Gabriel Junction. (150 towers over 12.7 miles or approximately 12 poles per mile).

alignment with the exception of one channel crossing at approximately S7 MP 9.6, which would require boring. A trench approximately 2 feet wide by 5 feet deep would be created for placement of the 66-kV subtransmission line underground, where six five-inch conduits providing for one operating circuit and one spare (3 conduits per circuit, 2 circuits total) would be placed in a concrete duct bank. A transition structure (pole) would be located on either end of the underground segment, where the footing hole would have a diameter of approximately 5 feet and require a depth of 15 to 20 feet depending on the soil type (SCE, 2008g). It is assumed that approximately three vaults would be required for the underground segment, with approximate dimensions of 11-feet wide by 22-feet long by 15-feet deep (SCE, 2008g). Based on these dimensions, a total of approximately 2,400 cubic yards of material would be excavated to create the duct bank, vaults, and transition poles for the underground 66-kV subtransmission line. Conduit would be installed at a rate of approximately 400 feet per day; vaults at approximately one per day; and footings for transition structures at approximately one per day, but could take two days in some cases (SCE, 2008g).

Whittier Narrows 66-kV Underground Re-Route (Segment 7)

Undergrounding of the 66-kV subtransmission line from approximately S7 MP 11.4 to 12.025 (generally along Durfee Avenue) would be completed similarly to the Duck Farm 66-kV Underground described above. A total of approximately 1,650 cubic yards of material would be excavated to create the duct bank, vaults, and transition poles for the underground 66-kV subtransmission line (SCE, 2008h).

2.7.2.1 Construction Equipment and Workforce

Construction equipment and workforce needs for Alternative 7 would generally be identical to the proposed Project, with the exception of the underground 66-kV construction equipment and associated workforce. It is assumed that approximately 6 to 18 workers would be required for underground 66-kV construction depending on the intensity and activity being performed.

2.7.2.2 Land Disturbance

Construction of Alternative 7 would be generally be the same as the proposed Project as discussed in Section 2.2.12; however, there would be some additional temporary land disturbance associated with the underground 66-kV subtransmission lines through the Duck Farm and along Segment 7 to re-route the 66-kV line around the Whittier Narrows Recreation area. New access and spur roads may ~~also~~ result in additional permanent land disturbance compared to the proposed Project in the area of ~~be required for~~ the new approximately 1,600~~200~~ foot ROW for the San Gabriel River crossing within Segment 8A associated with the Whittier Narrows 66-kV Overhead Re-Route (Option 1) or within the expanded ROW between Durfee Avenue and the San Gabriel River (Option 2). In general, the land disturbance estimates provided in Tables 2.2-2 through 2.2-9, would remain valid for this alternative. The estimated land disturbance associated with substation construction would be identical to the proposed Project for Alternative 7 as described in Section 2.2.12.14 above and provided in Table 2.2-10.

2.7.2.3 Hazardous Material Usage and Waste Management

As discussed in Section 2.2.12.15 for the proposed Project, construction of the Project would require limited use of hazardous materials, such as fuel, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations, including the construction phase SWPPP(s) for the T/L segments and substation components.

Waste generated as part of Alternative 7 is anticipated to be identical to the proposed Project, as provided in Tables 2.2-26 to 2.2-31 (located at the end of Chapter 2), with the exception of Segments 7 and 8 where Alternative 7 would result in potentially greater soil/vegetation waste as a result of additional 66-kV underground construction. The quantity of waste generated as a result of underground construction would be determined as part of final engineering and would be reused or disposed of at an approved waste disposal facility. The estimated construction waste for the substation elements for Alternative 7 would be identical to the proposed Project and are provided in Tables 2.2-34 through 2.2-39 (located at the end of Chapter 2).

2.7.2.4 Construction Schedule

The additional 66-kV underground construction and re-routes associated with Alternative 7 would not be expected to impact the construction schedule. As such, the construction schedule for Alternative 7 would be identical to the proposed Project, as shown in Table 2.2-43 (located at the end of Chapter 2).

2.7.3 Alternative 7 Operations and Maintenance

Operations and maintenance of Alternative 7, including T/L and substation components, would be identical to the proposed Project as described in Section 2.2.13, above. It should be noted that underground components prohibit the placement of permanent structures above or below the underground ducts and vaults, such that maintenance crews would be able to gain immediate access during emergencies and for regular maintenance (SCE, 2008g - DR#6: Q6-4). Permanent structures include, but are not limited to, trees, water ponds, buildings, beautification or decorative hills, rocks, etc.

2.7.4 Alternative 7 – Forest Service Permits and Plan Amendments

Requirements for Forest Service Permits and Plan Amendments would be identical to those described for Alternative 2 (see Section 2.2.14).

2.8 Other Alternatives Considered But Eliminated

As part of the development of the alternatives for this EIR/EIS, a screening process was completed to determine a reasonable range of alternatives. The screening process, as described and presented in the Alternative Screening Report located in Appendix A of this EIR/EIS, consisted of three steps: (1) Clarify the description of each alternative to allow comparative evaluation, (2) Evaluate each alternative using CEQA/NEPA criteria, and (3) Based on the results of Step 2, determine the suitability of each alternative for full analysis in the EIR/EIS. If the alternative was determined to be unsuitable, it was eliminate from further consideration. Alternatives considered but eliminated from further consideration included design variations, alternate corridors, and system alternatives. In addition to the potential alternatives that were evaluated in the Alternatives Screening Report, other ideas for potential alternatives were suggested by agencies and the public during the scoping period for the EIR/EIS (August-October 2007). Many of these suggestions were conceptual and were not offered as specific alternatives, but rather as ideas to be explored. For various reasons, these suggestions could not be developed into viable alternatives and, therefore, were not included in the alternatives screening process.

2.8.1 Design Variations

The following potential alternatives are design variations to the proposed Project, which would provide transmission capabilities between the new Windhub Substation and the existing Mira Loma Substation:

- **Whirlwind Substation Site A Alternative:** This alternative substation site was considered by SCE in its PEA (RA Retained 6, Alternative A). This alternative would place the new Whirlwind Substation on 113 acres of previously disturbed land east of Segment 4 and south of the proposed Whirlwind Substation. This substation site would require more land than the proposed Whirlwind Substation site resulting in greater construction impacts and the permanent loss of more land. There is an additional concern regarding soil stability as this is a proposed site for an aquifer recharge facility.
- **Whirlwind Substation Site B Alternative:** This alternative substation site was considered by SCE in its PEA (RA Retained 6, Alternative B). This alternative would place the new Whirlwind Substation on 102 acres of previously undisturbed land west of Segment 4 and the proposed Whirlwind Substation. This substation site would be located on previously undisturbed land and would require additional acreage resulting in additional construction impacts (air quality and biology) and the permanent loss of additional land.
- **Upgrade Transmission Through ANF in Segment 6 Only Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11A). It would replace one 220-kV T/L with one 500-kV T/L and construct a new 500-kV T/L in Segment 6, and establish a new east-west corridor between the cities of Duarte and Pasadena. However, system reliability would be compromised and would not meet the required CAISO/NERC/WECC Planning Standards. Additionally, the amount of new corridor and access roads required would increase the potential for air quality, biology, land use, noise, traffic and visual resource impacts.
- **Upgrade Transmission Through ANF in Segment 11 Only Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11B). It would replace the existing 220-kV T/L with one 500-kV T/L and construct a new 500-kV T/L in Segment 11, and establish a new east-west corridor between the cities of La Cañada Flintridge (Gould Substation) and Duarte. However, the amount of new corridor and access roads required would increase the potential for air quality, biological, land use, noise, traffic, and visual resource impacts.
- **Reduced Upgrades in Segment 6 Alternative:** This alternative was developed as a hybrid to the alternatives proposed by SCE (RA Eliminated 3, Options 6/11A and 6/11B) where upgrades through the ANF would occur within either Segment 6 or 11. This hybrid alternative would remove the need for a new east-west corridor associated with these other alternatives and would reduce the upgrades necessary within Segment 6 through the ANF required under the proposed Project. This alternative would reduce the number of new 500-kV T/Ls within the ANF along Segment 6 from two to one. However, the Antelope-Mesa 220-kV T/L would not be upgraded as part of this alternative, which would immediately limit the ability of the system to accommodate the additional generation from the TWRA and would not address South of Lugo transmission constraints.
- **Co-Locate All SCE T/Ls in Either Segment 6 or 11 Across the ANF Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11C). Existing transmission facilities would be moved from one corridor to the other within the ANF. It would result in a total of five T/Ls being located in a single corridor through the ANF, either in Segment 6 or 11, both designated utility corridors. A new east-west corridor would need to be established between the cities of La Cañada Flintridge (Gould Substation) and Duarte to accommodate up to three T/Ls. However, system reliability would be compromised and would not meet the required CAISO/NERC/WECC Planning Standards. In addition, this alternative would require substantially more construction and deconstruction than the proposed Project, resulting in greater air quality, biology, land use, noise, traffic, and visual resource impacts.
- **Reduced Number of 220-kV T/Ls in the ANF Alternative:** This alternative would provide similar upgrades to the proposed Project, but would remove the Rio Hondo-Vincent No. 1 220-kV T/L from Segment 6 and the Mesa-Vincent No. 1 220-kV T/L from Segment 11, thereby reducing the amount of visual "clutter" within the ANF. Additional upgrades would include adding a new 500-kV T/L south of Gould Substation to Mesa Substation and upgrading both the Rio Hondo and Mesa Substations. However, this alternative would not provide for the integration of new wind generation in the TWRA by 2010, and as

such would not comply with the California Renewables Portfolio Standard. In addition, a reduction of 220-kV lines through the ANF would decrease capacity and potentially overload the system. As a result, this would interfere with the objective of reliably transmitting 4,500 MW from the TWRA and would not address the South of Lugo transmission constraints.

- **Minimize 500-kV Upgrades Alternative:** Portions of Segments 6, 7, and 11 are currently proposed to be built to 500-kV standards, but would initially be energized to 220 kV for an undetermined length of time. This alternative would rebuild Segment 6 (from Vincent Substation to the southern boundary of the ANF), Segment 7 (from the southern boundary of the ANF to Rio Hondo Substation), and Segment 11 (from Vincent Substation to Gould Substation) to 220-kV standards to allow for the use of new 220-kV conductor, which would provide for additional capacity within SCE's transmission system. While this alternative would provide capacity to allow for the transmission of wind power from the TWRA, it would not accommodate the full 4,500 MW of wind generation currently being planned or expected in the future. Additional upgrades to the system, directly resulting from installation of a system that may meet initial needs for additional capacity, but does not adequately provide for future transmission needs, would eliminate any positive reduction in environmental impacts that this alternative may offer compared to the proposed Project**.**
- **Segments 6 and 11 Double-Circuit Structures Alternative:** This alternative would remove from Segment 6 two existing 220-kV T/Ls north of the crossover span (S6 MP 5.0) and an existing 220-kV T/L and 500-kV T/L south of the crossover span, and replace them with a new double-circuit 500-kV T/L to accommodate the new Rio Hondo-Vincent No. 2 500-kV T/L and the new Mira Loma-Vincent 500-kV T/L. In addition, this alternative would remove from Segment 11 two existing 220-kV T/Ls between the Vincent Substation and La Cañada Flintridge (Gould Substation) and replace them with a new double-circuit 500-kV T/L to accommodate the new Mesa-Vincent No. 1 and No. 2 500-kV T/Ls (initially energized at 220 kV). Implementation of this alternative would result in one existing 220-kV T/L (on single-circuit structures) and two new 500-kV T/Ls (on double-circuit structures) within Segment 6, and two new 500-kV T/Ls (on double-circuit structures) within Segment 11. However, these new towers would be bulkier and taller than the proposed single-circuit 500-kV towers; would require additional towers, and in fact may require the placement of towers outside of the existing ROW; fire safety issues may increase; the structures would not be feasible to construct by helicopter, resulting in the need for additional access roads; and would result in increased impacts associated with the removal of the existing 220-kV structures that would otherwise be untouched under the proposed Project. Furthermore, placement of two 500-kV T/Ls on a double-circuit structure would result in a less reliable design than the proposed Project. Due to both the issues surrounding the reliability of this alternative and the potential for substantially greater environmental impacts (both long-term and short-term), this alternative was eliminated from further consideration.
- **Segments 7/8A Single-Circuit 500-kV Structures Alternative:** This alternative was considered by SCE in its PEA (Technology Alternative 5). It would replace single-circuit 220-kV structures with single-circuit 500-kV structures between Rio Hondo Substation and Chino Substation within Segments 7 and 8A, whereas the proposed Project would use double-circuit 500-kV structures. However, the existing ROW would not be able to accommodate the new single-circuit 500-kV LST structures and could not be expanded due to existing infrastructure (San Gabriel River and the 605 Freeway) which would render this alternative infeasible.
- **Partial Composite Core Conductor Alternative:** This alternative was considered by SCE in its PEA (Technology Alternative 1). It would replace existing 220-kV conductors with lightweight composite core wrapped conductors for the purpose of increasing capacity (up to 50 percent) between the Vincent Substation and the Mesa Substation, and between the Mesa Substation and the Chino Substation. However, this alternative would limit the overall system capacity, and would require upgrades of the existing transmission structures resulting in environmental impacts that are substantially the same as the proposed Project.

2.8.2 Alternate Corridors

The following potential alternatives provide alternate corridors for some segments of the proposed alignment, which would provide for the delivery of power from the TWRA to the Mira Loma Substation in Ontario.

- **Segment 10A Route Alternative:** This alternative route was considered by SCE in its PEA (RA Retained 7). It would route approximately 18 miles of a single-circuit 500-kV T/L along a new 330-foot-wide corridor that would connect the new Windhub Substation with the proposed Whirlwind Substation. This alternative would mostly parallel the Los Angeles Aqueduct which has existing access roads resulting in a reduction of associated air quality, noise, and visual impacts. However, this minor savings would be offset by the longer route required. As such, this alternative would not offer any substantial or noticeable improvement over the proposed Project.
- **Segment 10B Route Alternative:** This alternative route was considered by SCE in its PEA (RA Retained 7). It would follow the Segment 10A Route Alternative for approximately 2.5 miles, turn west for approximately 4 miles, and then turn south along the undesignated 160th Street for approximately 2 miles. From this point, the route would realign with the Segment 10A Route Alternative. This alternative would provide for some potential reduction in visual impacts by moving the T/L behind existing homesteads. However, this minor savings would be offset by the longer route required, which would result in greater air quality, biology, noise and visual impacts. As such, this alternative would not offer any substantial or noticeable improvement over the proposed Project.
- **Windhub Substation to Cottonwind Substation to Whirlwind Station Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 7). It would establish a new corridor along the foothills of the Tehachapi Mountain Range from Windhub Substation to Cottonwind Substation. From this point, the route would continue southeast along the Segment 4 corridor to Whirlwind Substation. While this alternative would place a portion of the new 500-kV T/L adjacent to existing ROW, the need for a new approximately 25-mile, 200-foot-wide T/L corridor along the foothills of the Tehachapi Mountain Range (between the Windhub Substation and the Cottonwind Substation) would result in greater environmental impacts than the proposed Project.
- **Whirlwind Substation to Antelope Substation Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 1). It would establish a new utility corridor between the proposed Whirlwind Substation and the existing Antelope Substation in Segment 4 at a distance of at least 2,000 feet from either the east or west side of the existing corridor. However, this alternative would require the establishment of a new T/L corridor and would result in a slightly longer alignment. The new corridor and access roads required would increase the potential for air quality, biology, land use, noise, and visual resource impacts. As such, this alternative would not substantially lessen any significant impacts associated with the proposed Project.
- **Antelope Substation to Vincent Substation Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 2). It would establish a new utility corridor between Antelope Substation and Vincent Substation in Segment 5 at a distance of at least 2,000 feet from either the east or west side of the existing corridor. However, this alternative would require the establishment of a new T/L corridor and would result in a slightly longer alignment. The new corridor and access roads required would increase the potential for air quality, biology, land use, noise, and visual resource impacts. As such, this alternative would not substantially lessen any significant impacts associated with the proposed Project without creating greater impacts of its own.
- **Use LADWP Transmission Corridor through the ANF Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11D). It would establish two new 500-kV T/Ls in one of two existing LADWP utility corridors, which would be expanded to accommodate the new lines. For the northern corridor, the new 500-kV T/Ls would originate at Antelope Substation and continue to Sylmar Substation. For the southern corridor, the new 500-kV T/Ls would originate at Vincent Substation and continue to the Tujunga Valley. Both would require a new east-west corridor to Gould Substation to connect

into the southern portion of Segment 11 and on to the City of Duarte to connect into Segment 7. However, this alternative would not fully meet the objectives/purpose and need of the TRTP, would compromise system reliability, and therefore would not meet CAISO/NERC/WECC requirements. Furthermore, it would result in a longer alignment which may also traverse the ANF (depending on which LADWP corridor is used) and result in greater air quality, biology, land use, noise, and visual impacts.

- **New SCE Corridor Across the ANF Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11E). It would locate two new 500-kV T/Ls in a new corridor that would generally follow State Highway 39 through the ANF. A new east-west corridor would be required from where the T/Ls exit the ANF to the City of Duarte to connect into Segment 7 and to a point south of the Gould Substation to connect into the southern portion of Segment 11. However, this alternative would not fully meet the objectives/purpose and need of the TRTP, would compromise system reliability, and therefore would not meet CAISO/NERC/WECC requirements. Furthermore, it would result in a longer alignment which would also traverse the ANF and result in greater air quality, biology, land use, noise, and visual impacts.
- **New Corridor along Highway 14 Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 4). It would locate two new 500-kV T/Ls in a new corridor from the Vincent Substation, along State Highway 14, to the Rinaldi Substation area (near the interchange of the I-5 and Highway 210). A new east-west corridor would be required from the Rinaldi Substation area to the City of Duarte. However, this alternative would not fully meet the objectives/purpose and need of the TRTP, would compromise system reliability, and therefore would not meet CAISO/NERC/WECC requirements. Furthermore, it would result in a longer alignment requiring the establishment of substantial new ROW resulting in greater air quality, biology, land use, noise, and visual impacts.
- **New Corridor through Cajon Pass Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 5). This would route a new 500-kV T/L in a new corridor from Vincent Substation east, towards the Lugo Substation through the San Bernardino National Forest (SBNF), and then south through the Cajon Pass to the Mira Loma Substation. However, would not fully meet the objectives/purpose and need of the TRTP or comply with CAISO/NERC/WECC requirements. Furthermore, this alternative would result in a longer alignment requiring the establishment of substantial new ROW through the SBNF resulting in greater air quality, biology, noise, and visual impacts.
- **San Gabriel Valley New Corridor Alternative:** This alternative would differ from the proposed Project within Segments 7 and 8a only. The new Rio Hondo-Vincent No. 2 T/L would follow the existing Antelope-Mesa alignment and terminate at the Rio Hondo Substation utilizing single-circuit 500-kV structures rather than double-circuit 500-kV structures. In addition, the new Mira Loma-Vincent 500-kV T/L would head east upon leaving the ANF within a new approximately 200-foot wide ROW for approximately 20 miles, along the foothills of the San Gabriel Mountains, between the cities of Azusa and Rancho Cucamonga. This route would then turn south at Blanchard Street in Rancho Cucamonga to join the existing Lugo-Serrano transmission corridor, which parallels Day Creek, before terminating at Mira Loma Substation. Under this alternative, no construction activities would occur between Rio Hondo Substation and Chino Substation within Segments 7 and 8a. However, the amount of new corridor and access roads required would increase the potential for air quality, biological, land use, noise, traffic, and visual resource impacts. Overall, this alternative would not substantially lessen any significant impacts of the proposed Project without creating greater impacts of its own.

2.8.3 System Alternatives

The following potential alternatives are system-wide variations to the proposed Project. These system alternatives were developed by the Tehachapi Collaborative Study Group.

- **Transmission Lines to Midway Substation Alternative:** This system alternative was suggested by SCE in its PEA (System Alternative 1). In addition to the upgrades proposed for Segments 5 through 11, this

alternative would construct a new 500-kV T/L within a new ROW between Whirlwind Substation and Midway Substation near Bakersfield. This alternative would require approximately 76 miles of new ROW between the Whirlwind and Midway Substations (versus the 16 miles of new ROW between the Whirlwind and Antelope Substations required under the proposed Project), and would also likely result in the need for extensive additional upgrades (undefined) within the PG&E system. As such, the environmental disadvantages of this alternative far outweigh the environmental advantages.

- **Non-Transmission System Alternative:** This system alternative was suggested by SCE in its PEA (System Alternative 2). It would include the development of in-basin generation instead of interconnecting generation from the TWRA. In addition, demand-side management and energy efficient programs would be implemented. However, this alternative does not meet the basic objectives/purpose and need of the TRTP.

2.8.4 Other Alternatives Considered

Alternatives were also suggested by public agencies and the public during the scoping period for the EIR/EIS (August-October 2007). While some of these requests were detailed enough to generate viable alternatives, others lacked specificity and instead only suggested that some other alternative must be possible. It was also determined that some suggestions were better suited for consideration as mitigation measures within the EIR/EIS. For various reasons, these suggestions did not lead to the development of viable alternatives and, therefore, could not be included in the screening process. Below is a list of concepts for alternatives brought up during the scoping period that did not result in the formulation of potential alternatives. For a complete description of these concepts and the reasons for elimination, please see the Alternatives Screening Report located in Appendix A.

- Avoid Impacts to Habitat Authority Properties
- Avoid Parklands, Public Open Space, and Recreation Areas
- Reduce Impacts to the River Commons Project
- Reduce New ROW Width West of Mira Loma Substation
- Use Existing Corridors
- Rowland Heights Water District Detour
- Chino Hills 500-kV Split
- Use Tubular Steel Poles
- Match Existing Structure Heights
- Solar Power

2.9 Cumulative Projects

2.9.1 Introduction

Preparation of a cumulative impact analysis is required under both NEPA and CEQA. NEPA and CEQA identify three types of potential impacts: direct, indirect, and cumulative. “Cumulative impact” is the impact on the environment which results from the incremental impact of the proposed Project when considered with other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such other actions.

Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.” 40 CFR §1508.7. Under NEPA, both context and intensity are considered in determining significance. Among other considerations when considering intensity is “[w]hether the action is related to other actions with individually minor but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.” 40 CFR §1508.27(b)(7).

Under the State CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." 14 Cal Code Regs §15130(a)(1). An EIR must discuss cumulative impacts if the incremental effect of a project, combined with the effects of other projects is "cumulatively considerable." 14 Cal Code Regs §15130(a). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." 14 Cal Code Regs §15164(b)(1). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

Both the severity of impacts and the likelihood of their occurrence are to be reflected in the discussion, "but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion of cumulative impacts shall be guided by standards of practicality and reasonableness, and shall focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact." 14 Cal Code Regs §15130(b).

CEQA Pub. Res. Code § 21000 *et seq.*, requires that an environmental impact report ("EIR") take into account all "past, present, and reasonably foreseeable future projects." CEQA Guidelines §§15355(b), 15130(b)(1)(A). Similarly, the Council on Environmental Quality ("CEQ") recommends that agencies "look for present effects of past actions that are, in the judgment of the agency, relevant and useful because they have a significant cause-and-effect relationship with the direct and indirect effects of the proposal for agency action and its alternatives." Cumulative impacts analysis should highlight past actions that are closely related either in time or location to the project being considered, catalogue past projects and discuss how they have harmed the environment and discuss past actions even if they were undertaken by another agency or another person. The analysis must be in sufficient detail to be useful to the decision maker in deciding whether, or how, to alter the program to lessen cumulative impacts. Most of the projects listed in the cumulative projects table below (Table 2.9-12) have, are, or will be required to undergo their own independent environmental review under either CEQA or NEPA or both. Significant adverse impacts of the cumulative projects would be required to be reduced, avoided or minimized through the application and implementation of mitigation measures. The net effect of these mitigation measures is assumed to be a general lessening of the potential for a contribution to cumulative impacts. The key consideration is whether the remaining physical change or effect on the environment represents an adverse environmental impact.

2.9.2 Methodology

Under CEQA, there are two commonly used approaches, or methodologies, for establishing the cumulative impact setting or scenario. One approach is to use a "list of past, present, and probable future projects producing related or cumulative impacts." 14 Cal Code Regs §15130(b)(1)(A). The other is to use a "summary of projects contained in an adopted general plan or related planning document, or in a prior environmental document which has been adopted or certified, which described or evaluated regional or area wide conditions contributing to the cumulative impact." 14 Cal Code Regs §15130(b)(1)(B).

The cumulative scenario under NEPA relies on current environmental conditions which reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. Specifically, how conditions have changed over time and how they are likely to change in the future when added to the impacts of the proposed Project and alternatives. The Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) state the following:

> CEQ [Council on Environmental Quality] regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects… Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision-making.

Of the two methodologies, this EIR/EIS uses the CEQA list approach to provide a tangible understanding and context for analyzing the potential cumulative effects of a Project, which effectively meets the criteria for both CEQA and NEPA cumulative analyses. Therefore, lists of past, present, and proposed future projects were obtained from county and local agencies surrounding the Project route. In addition, general plans and other planning documents were used as reference points in establishing the cumulative scenario for the analysis.

The project list includes proposed wind energy and other major infrastructure projects within the Tehachapi Wind Resource Area (TWRA), and projects found within a geographic area sufficiently large enough to provide a reasonable basis for evaluating cumulative impacts. ~~In particular, the Alta Oak Creek Mojave Project and the PdV Wind Energy Project are considered connected actions and a project-level analysis is included in this EIR/EIS under~~A programmatic analysis of the impacts of future wind energy development in the TWRA is presented in Chapter 6, Development of the Tehachapi Wind Resource Area.

The area over which the cumulative scenario is evaluated may vary by resource, because the nature and range of potential effects vary by resource (e.g., air quality impacts tend to disperse over a large area or region whereas noise impacts are typically more localized in nature). This spatial area is identified as the geographic scope for the analysis of cumulative impacts related to a particular resource.

The analysis of cumulative effects considers a number of variables including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. The geographic scope of the analysis is based on the nature of the geography surrounding the proposed Project and the characteristics and properties of each resource and the region to which they apply. In addition, each project in a region will have its own implementation schedule, which may or may not coincide or overlap with the proposed Project's schedule. This is a consideration for short-term impacts from the proposed Project. However, to be conservative, the cumulative analysis assumes that all projects in the cumulative scenario are built and operating during the operating lifetime of the proposed Project.

2.9.3 Energy Infrastructure Projects

SCE is obligated to integrate power generation facilities, including wind farms, into its electrical system, per Section 210 and 212 of the Federal Power Act (16 U.S.C. §824 (i) and (k)) and Section 3.2 and 5.7 of the California Independent System Operator's (CAISO) Tariff. The following section details the wind energy projects proposed within the Tehachapi area, as well as other significant non-wind energy projects.

Wind Generation Projects

According to Kern County's 2004 General Plan, full realization of the County's wind energy may be hampered due to the lack of adequate power transmission capacity. As a result, the Plan noted a policy to support the construction of additional transmission capacity projects where land use and other constraints are minimal. The

following describes the wind energy developments with applications currently in progress with Kern County. ~~In addition, as noted above, the PdV Wind Energy Project and the Alta-Oak Creek Mojave Project are considered connected actions. As such, Chapter 6 provides a project level analysis.~~

PdV Wind Energy Project

The proposed PdV Wind Energy Project is located at the southwestern end of the TWRA, just north of the Cottonwind Substation (see Figure 6.2-2 in Chapter 6 of this EIR/EIS). It is proposed to be located on 5,820 acres of land with up to 300 wind turbines to produce 300 MW of wind energy. The project will also include a substation to step up the voltage generated by the turbines to meet the electrical system's 220-kV or 500-kV voltage. The PdV Wind Energy Final EIR for this project was completed in February 2008 and w~~h~~as ~~been recommended for~~ approved~~al~~ by the Kern County Board of Supervisors on July 29, 2008. A summary of the PdV EIR can be found in Appendix E, which outlines the description of the proposed project, the project alternatives, potential impacts, and mitigation measures.

Alta Wind Energy Center

The proposed Alta-Oak Creek Mojave Project is located at the center of the TWRA, adjacent to the Windhub Substation (see Figure 6.2-2 in Chapter 6 of this EIR/EIS). It is proposed to be located on approximately 11,000 acres of land with up to 350 wind turbines to produce up to 800 MW of wind energy. It would be the first project of the Alta Wind Energy Center which is designed to produce 1,500 MW of wind power. Kern County is currently beginning the environmental review process for this project. An Initial Study was completed by Kern County in December 2008. Since this project is located within the TWRA, it is included in the programmatic analysis (see Chapter 6).

Pine Tree Wind Development Project

This LADWP project proposes the construction of 80 1.5-MW wind turbines on approximately 8,000 acres of land to produce 120 MW of wind energy. LADWP would also construct and operate approximately 8 miles of 230-kilovolt (kV) transmission line and a switching station, which would connect the project substation to an existing LADWP 230-kV transmission line. It is not expected to connect to SCE's transmission system. Construction on this project began in January of 2008.

Pine Canyon Wind Project

The Pine Canyon Wind Project is expected to be constructed on 12,000 acres of land adjacent to the Pine Tree Wind Development Project. It is proposed to produce 150 MW of wind energy. No environmental documentation currently exists on this proposed project.

Wind Generation Projects in Early Planning Stages

Currently, there are various plans to develop additional wind energy projects in the vicinity of the Tehachapi area. Table 2.9-1 (located at the end of Chapter 2) lists the wind energy projects that are in the early planning stages. The BLM applications are requests for three-year testing right-of-ways where only meteorological towers would be authorized. The remaining projects are not yet in the application stage; therefore, specific information is not available. Nonetheless, it is possible that all of the projects listed in Table 2.9-1 could pose cumulative impacts in the future.

California Independent System Operator (CAISO) Interconnection Queue

The Federal Energy Regulatory Commission (FERC) issued an order in July 2008, granting the California ISO the ability to clear a logjam that has hindered renewable projects attempting to connect to the California grid. In the FERC order, the CAISO was given permission to waive certain rules and timelines for handling requests from new power plants hoping to hook up to the transmission system. As a result, the CAISO can begin immediately to reduce a backlog of projects in its overloaded generation interconnection queue. One of the primary benefits is to help accelerate development of green power needed to meet California's Renewables Portfolio Standard and greenhouse gas reduction goals.

The CAISO will generally use a clustering approach to study interconnection requests and open two "Queue Cluster Windows" (four months in duration) each year, during which the CAISO will accept interconnection requests. Although each interconnection request will receive a "queue position" for tracking purposes, queue position no longer has any significance. All interconnection requests received during a particular queue cluster window will effectively have the same position in the CAISO's interconnection queue.

The CAISO will now be allowed to create three study groups:

- A grandfathered ***serial study group*** that would give expedited treatment to projects already in the queue,
- A ***transition cluster***, comprising non-grandfathered projects submitted on or before June 2, 2008. Transition cluster refers to the collection of valid interconnection requests with an assigned queue position on or before June 2, 2008 that were not included as part of the Serial Study Group; and
- An ***initial cluster*** for projects submitted on or after June 3, 2008.

As energy projects are proposed, completed, or withdrawn, the CAISO queue is constantly changing and regularly updated. Therefore, the queue has been tracked throughout the course of this EIR/EIS analysis. As of July 25, 2008, the total wind energy proposed for Kern County was 5,973.1 MW. The total has since changed to 4,791.1 MW, as listed in the January 9, 2009, CAISO queue. Currently, four projects are part of the transition cluster, with the remaining projects included as part of the serial study group. Table 2.9-2 (located at the end of Chapter 2) provides details regarding the wind energy projects that are listed in the CAISO queue.

Electrical Transmission Projects

Whirlwind Substation Expansion

When the Whirlwind Substation was originally designed for the proposed Project, there were approximately 4,500 megawatts of generation in the CAISO queue that would interconnect to the project. The 4,500 MW level of generator interconnection required a 500/220 kV substation at Whirlwind that covered approximately 60 acres. With the increased demand for renewable energy, the CAISO interconnection queue has grown considerably since submission of the PEA and now approximately 9,000 MW may connect to the Project. To accommodate growing renewable energy demand and growth in the CAISO interconnection queue, the proposed Project now includes an expansion of the Whirlwind Substation to approximately 90 acres in size to allow adequate room in the future for four transformer banks and the additional line positions that would facilitate the additional renewable energy generation. The equipment that would be contained in the expanded substation likely would be similar to the equipment described in the Draft EIR/EIS. Additional equipment may be necessary based on final engineering of the substation. As a result, future construction of the facilities in the

expansion area could result in cumulative impacts in areas surrounding the intersection of 170th Street and Holiday Avenue in Kern County.

Antelope Transmission Project Segments 1-3

Construction of SCE's Antelope Transmission Project is currently underway, and will occur in three sequential segments: Segment 1, Antelope-Pardee 500-kV Transmission Line; Segment 2, Antelope-Vincent 500-kV Transmission Line; and Segment 3, Antelope-Tehachapi Transmission Line.

Segment 1 of the Antelope Transmission Project involves the construction of a new 27.1-mile 500-kV transmission line between SCE's existing Antelope and Pardee Substations, located in the City of Lancaster and the City of Santa Clarita, respectively. This project includes modifications to Antelope and Pardee Substations and the expansion of Antelope Substation. Segment 1 is a 500-kV single-circuit transmission line located within an existing SCE 66-kV transmission line ROW for approximately 5.7 miles (northern portion), establishes a new 500-kV ROW for approximately 15.5 miles in and through the ANF (middle portion), and is located within the existing SCE Pardee-Vincent 500-kV ROW for approximately 5.9 miles (southern portion). The line would initially be energized at 220 kV to serve the existing transmission needs determined by SCE and, as energy demand increases, it would be upgraded to 500 kV. Implementation of Segment 1 would facilitate and accommodate the construction of Segments 2 and 3.

Segment 2 (Antelope-Vincent 500-kV T/ L) consists of a new 17.8-mile 500-kV transmission line connecting SCE's existing Antelope Substation with the Vincent Substation, located near Acton, California. This line would be constructed to deliver electricity from new wind farms to communities in southern California. Similarly to Segment 1, this segment would initially be energized at 220-kV. Constructing this segment would require the acquisition of new land adjacent to existing transmission ROW.

Segment 3 (Antelope-Tehachapi T/L) consists of two phases. The first phase includes construction of a new 26.1-mile, 500-kV transmission line connecting SCE's existing Antelope Substation to a proposed substation (Substation 1) in the Mojave Area. This transmission line would initially be energized at 220- kV. The second phase would consist of a new 9.4-mile, 220-kV transmission line from the proposed Substation 1 to a proposed substation in the Monolith Area (Substation 2). The transmission line and proposed Substation 2 would be constructed to transmit electricity from the wind farms to communities in southern California. Construction of Segment 3 would require the acquisition of new ROW and substation property.

Barren Ridge Renewable Transmission Project

LADWP proposes to construct 75 miles of a new 230-kV T/L from the Barren Ridge Switching Station (located north of California City) to the proposed Haskell Switching Station, and 12 miles of a new T/L on existing towers from the proposed Haskell Switching Station to the Castaic Power Plant. The proposal includes construction of the Haskell Switching Station, which would be located at Haskell Canyon just north of Santa Clarita. In addition, the proposed project would upgrade conductors on the existing 230-kV T/L from the Barren Ridge Switching Station to the Rinaldi Substation (located in San Fernando). Construction for the new T/Ls and upgrades would occur on approximately 13 miles of National Forest System land and four miles of Bureau of Land Management lands. The project is currently in the Draft EIR/EIS development stage of the CEQA/NEPA process.

Other Energy Projects

Walnut Creek Energy Park Power Plant

The Walnut Creek Energy, LLC, has proposed an 11.48-acre development with five natural gas-fired turbine-generators that would produce 500 MW of energy. Construction of this power plant would occur north of Segment 8A in the City of Industry. This project was approved~~is currently being reviewed~~ by the CEC in February 2008 and is expected to be on-line in May~~October~~ of 2011~~08~~.

El Paso Line 1903 Conversion Project

This project proposes to convert a crude oil pipeline to a natural gas system. Construction of the conversion would traverse the Project in Segment 10, just south of Windhub Substation.

Bureau of Land Management Solar Energy Applications

The Bureau of Land Management (BLM) has received more than 40 applications for solar energy projects located in the California Desert Conservation Area (CDCA). The projects listed in Table 2.9-3 (located at the end of Chapter 2) are located in the vicinity of the TWRA and could potentially interconnect with the proposed Project.

Palmdale Hybrid Power Plant

The City of Palmdale has proposed to construct and operate the Palmdale Hybrid Power Plant (PHPP) on a 377-acre site located on East Avenue M in northeast Palmdale. The PHPP would combine natural gas and solar thermal generating equipment to produce a nominal electric output of 617 MW. The PHPP project would be fueled by approximately 8.7 miles of a new natural gas pipeline within existing street ROW, which would be designed and constructed by the Southern California Gas Company. The project would interconnect with SCE at the Vincent Substation located south of Palmdale. This would require the construction of a 35.6 mile transmission line from the PHPP to the Vincent Substation. The application is currently being reviewed by the CEC. If approved, commercial operation would begin in the summer of 2013.

AV Solar Ranch One Project

The proposed AV Solar Ranch One Project is located in unincorporated Los Angeles County approximately 20 miles northwest of the City of Lancaster. The proposed site is approximately 2,100 acres of vacant land which consists of undeveloped land or land previously used for agricultural production. The proposed solar facility consists of a 230-MW solar photovoltaic (PV) facility which would include PV panel arrays, an electrical substation, a 20,000 sq. ft. Operations and Maintenance building with associated parking, and approximately 3.5 miles of a new 230-kV transmission line that would connect to the Whirlwind Substation (see Section 2.2.10.1 – Whirlwind Substation). The County of Los Angeles is the lead agency and issued an NOP for an EIR on April 29, 2009.

2.9.4 Major Infrastructure Projects

Proposed Transportation Projects

California High Speed Rail

This project proposes a 700+- mile high speed rail line from Sacramento to San Diego. Construction of this rail line would intersect the Project at Segments 5, 7, and 8A. Engineering and design for the Maglev Project is scheduled to begin in 2008.

Orangeline High Speed Maglev Project

This project proposes a 275-mile magnetic levitation rail line that would serve regions throughout Southern California, and provide connections to Central California and Las Vegas, Nevada. Construction of this rail line would intersect TRTP at Segments 5 just north of Vincent Substation, at Segment 7 in City of El Monte, and Segment 8A in the City of Chino. The Orangeline Development Authority has a goal of initiating one line of service in 2013.

Metro Gold Line Extension

This project proposes a 24-mile light rail line along an existing rail right-of-way from the City of Pasadena to the City of Montclair. Construction of Phase I of the Gold Line Extension would intersect the Project at Segment 7 in the City of Irwindale. The first phase of construction is scheduled to commence in 2008 and is expected to begin service in 2011.

Proposed Water Projects

Antelope Valley Water Bank Project

This project proposes to develop facilities to store and recharge imported surface water and associated delivery and distribution pipelines. The 13,440-acre facility area would be bounded by the Kern/Los Angeles County border line (also known as Avenue A) to the south and Rosamond Blvd to the north, and between 170th Street West and 100th Street West in unincorporated Kern County. Segment 4 of the Project would traverse the Water Bank Facility at approximately 160th Street West and Avenue A.

2.9.5 Applicable Cumulative Projects by Jurisdiction

A summary of foreseeable projects that could contribute to the cumulative effects scenario are listed by jurisdiction in Table 2.9-4 (located at the end of Chapter 2). A comprehensive list, noting individual projects per jurisdiction, is included at the end of this chapter in Table 2.9-12. Collectively, these projects represent known and anticipated activities that may occur in the Project vicinity that have the potential to contribute to a cumulative impact on the environment. Figures 2.9-1a through d, provided at the end of Chapter 2, map the summary of projects occurring along the proposed route, including two USACE projects located near Segment 7.

There are current or future projects in addition to those listed in Table 2.9-12 (located at the end of Chapter 2) that would occur outside the immediate vicinity of the proposed Project, but are notable to this cumulative scenario. A complete list of these additional, notable projects is found in Table 2.9-5 (located at the end of Chapter 2).

2.9.6 Cumulative Projects on Federal Lands

Table 2.9-6 (located at the end of Chapter 2) lists all projects that are in progress or are proposed on federal lands in the vicinity of the Project, and includes a brief description and current status of each project. Figure 2.9-2 (located at the end of Chapter 2) maps the summary of projects occurring within the ANF or those that are proposed by the USDA Forest Service. Previous development within the ANF includes recreational, industrial, and residential uses. The majority of the current proposals are for fuel management, road management, recreation management, and special use management projects. In addition, the USACE has two projects along Segment 7 of the proposed route, which are mapped in Figure 2.9-1c (located at the end of Chapter 2).

2.9.7 General Plans and Environmental Documents

As noted above, the cumulative impact analysis relies on a project list approach. However, a number of plans and projections, such as those found in General Plans and other planning and environmental documents, were examined during the course of the development of this EIR/EIS. These provide insight into longer-term expectations regarding development and ultimate build out scenarios and timelines which are used to inform the cumulative analysis. Table 2.9-7 (located at the end of Chapter 2) lists the documents consulted.

2.9.8 Forecast Population and Employment Growth

The proposed project traverses a broad geographic area which includes several cities within Los Angeles, Kern and San Bernardino Counties. In addition to the list of cumulative projects presented in Table 2.9-12 (located at the end of Chapter 2), general growth trends forecasted by the Kern Council of Governments (KernCOG) and Southern California Association of Governments (SCAG) were utilized to characterize anticipated population and employment growth along the proposed project corridor. Since the project traverses such a broad geographic area, it is difficult to interpret growth and employment forecasts specific to the project corridor itself. Therefore, Tables 2.9-8 through 2.9-11 (located at the end of Chapter 2) present general information on each city that is traversed by the proposed project. Although, growth forecast data for Kern County was not available for the same years as was available for both Los Angeles and San Bernardino Counties, general conclusions regarding growth can be inferred based on the data available.

This information provides a general understanding of the types of physical changes expected in the area and the potential for impacts that could combine with the impacts of the proposed Project. As regional planning agencies both KernCOG and SCAG forecast growth projections into the future by incorporating recently available information from international, federal, and State statistical agencies, along with subregions and local jurisdictions.

The incorporated cities that are traversed by the proposed ~~p~~Project within ~~San Bernardino and~~ Los Angeles and San Bernardino Counties have consistently experienced positive growth rates in both population and employment between 2000 and 2005. ~~Additionally,~~ According to SCAG's population projections, it is anticipated that the region will continue to be characterized by rapid growth. As shown in Table 2.9-10, ~~B~~between 2000 and 2030~~,~~ it is expected that north of the ANF, along Segments 4 and 5, the average population increase in incorporated cities is projected to be 152 percent. South of the ANF, along Segments 11, 7, 8A, 8B and 8C, the average population increase in incorporated cities is estimated to be 25.1 percent.~~population will increase anywhere between 2.5 percent to 186.5 percent and employment will also increase from anywhere between 3.2 percent to 153 percent.~~

The same general positive growth trends can be found for the Bakersfield MSA, in Kern County. Population growth is expected to grow by 133 percent between 2000 and 2050. Employment is also expected to grow by 15 percent between 2004 and 2014. In following with general growth patterns, we can expect an increase in employment beyond 2014 as employment increases are tied to population increases.

The increase in regional growth may indirectly contribute to potential cumulative impacts in the proposed Project area. An increase in population growth directly affects the demand for jobs and housing, which may increase the number of planned development and improvement projects, such as public service facilities or transportation system expansions in the project area. Substantial population or employment increases near the area of the proposed Project also substantially increase the population potentially exposed to an accident or other hazard.

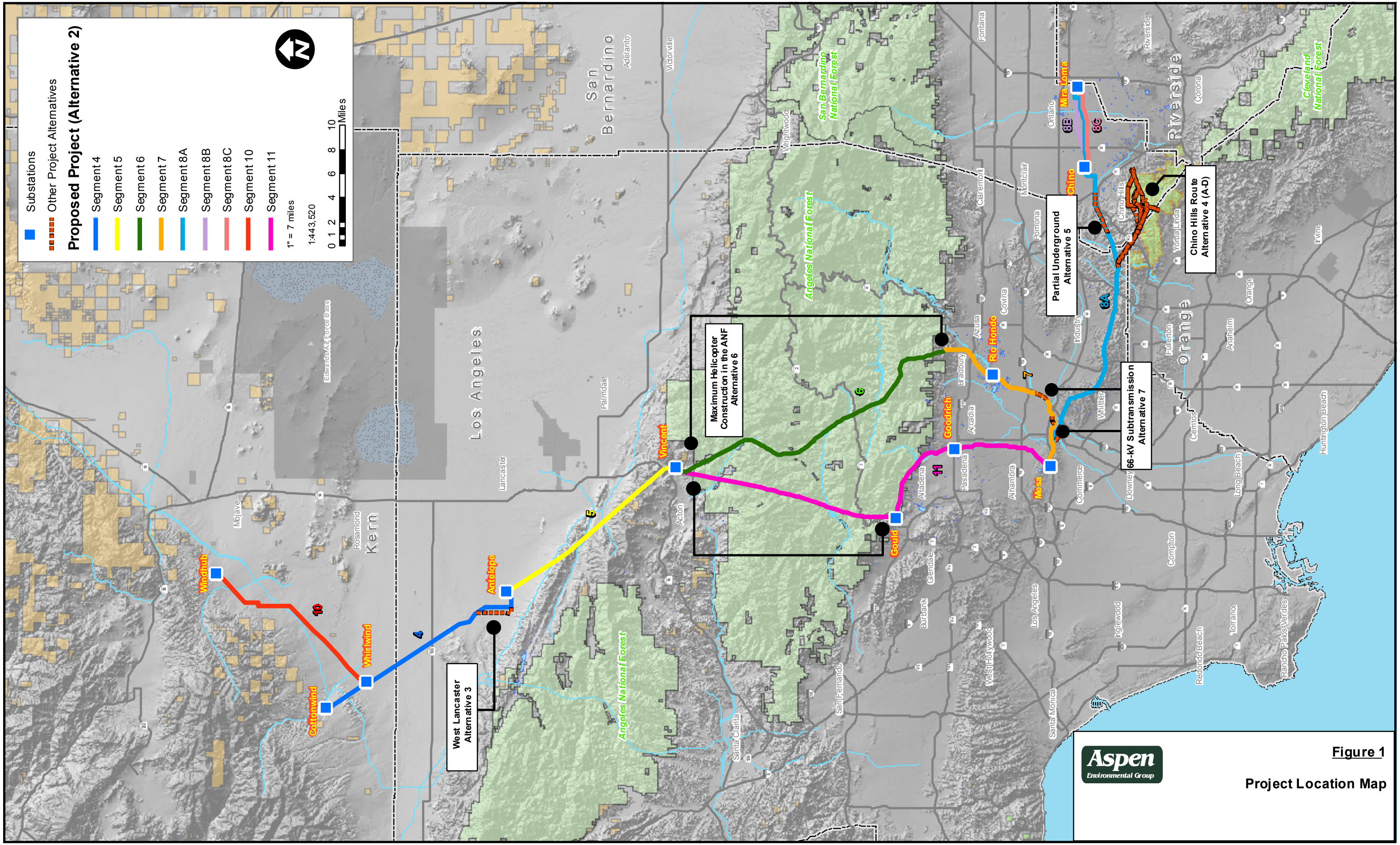


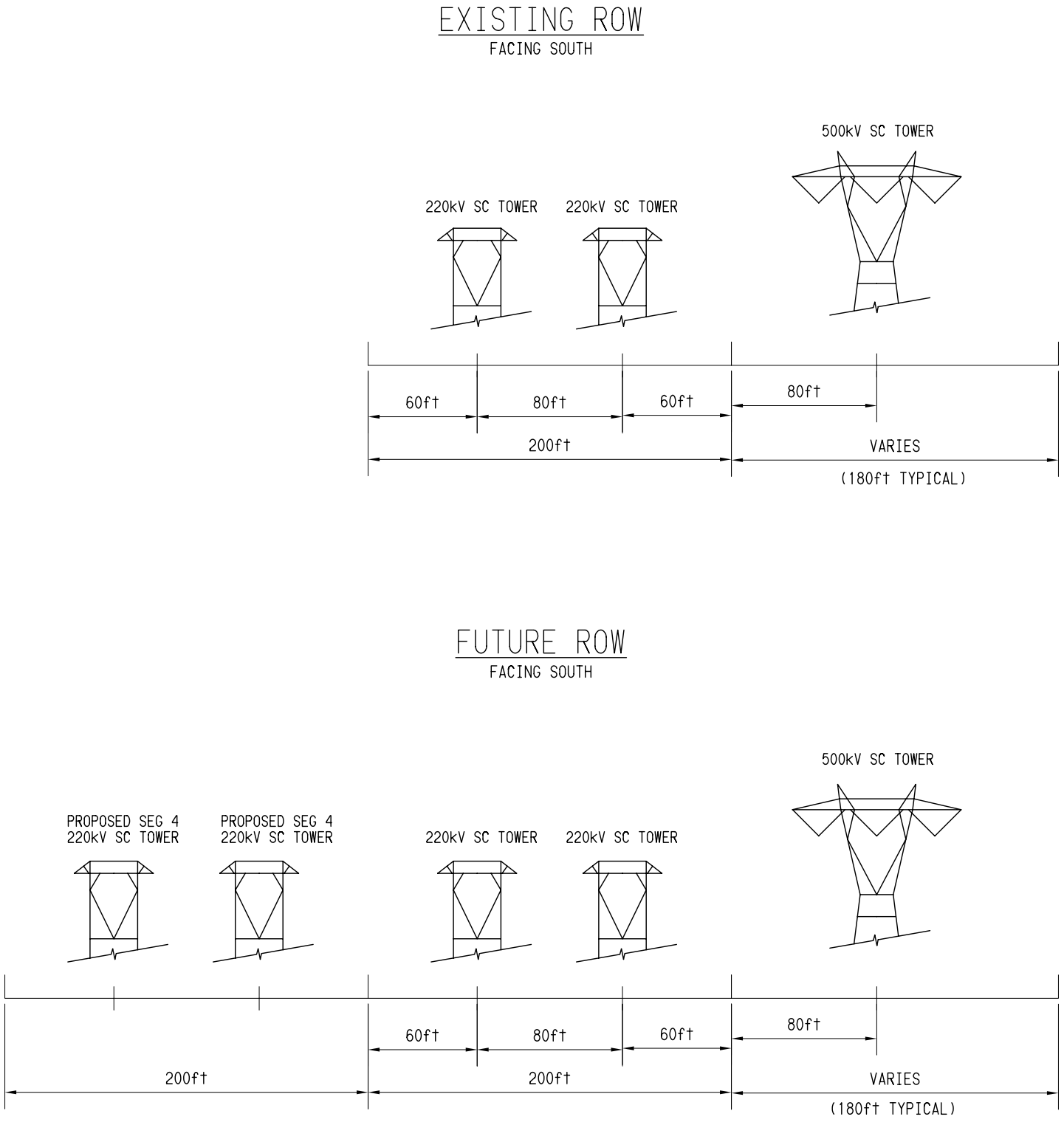
Figure 1

Project Location Map

ALTERNATIVE 2

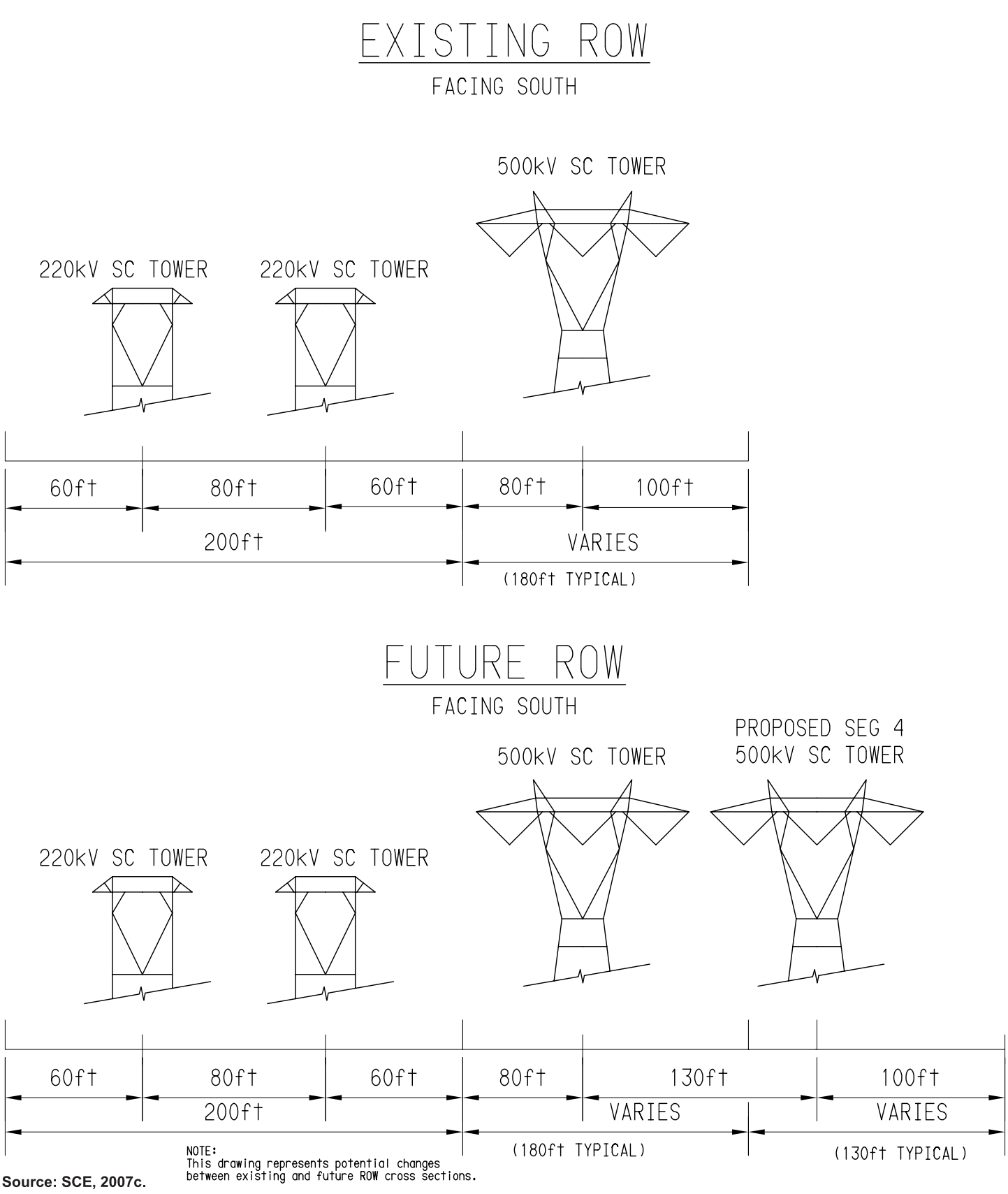
(PROPOSED PROJECT)

FIGURES



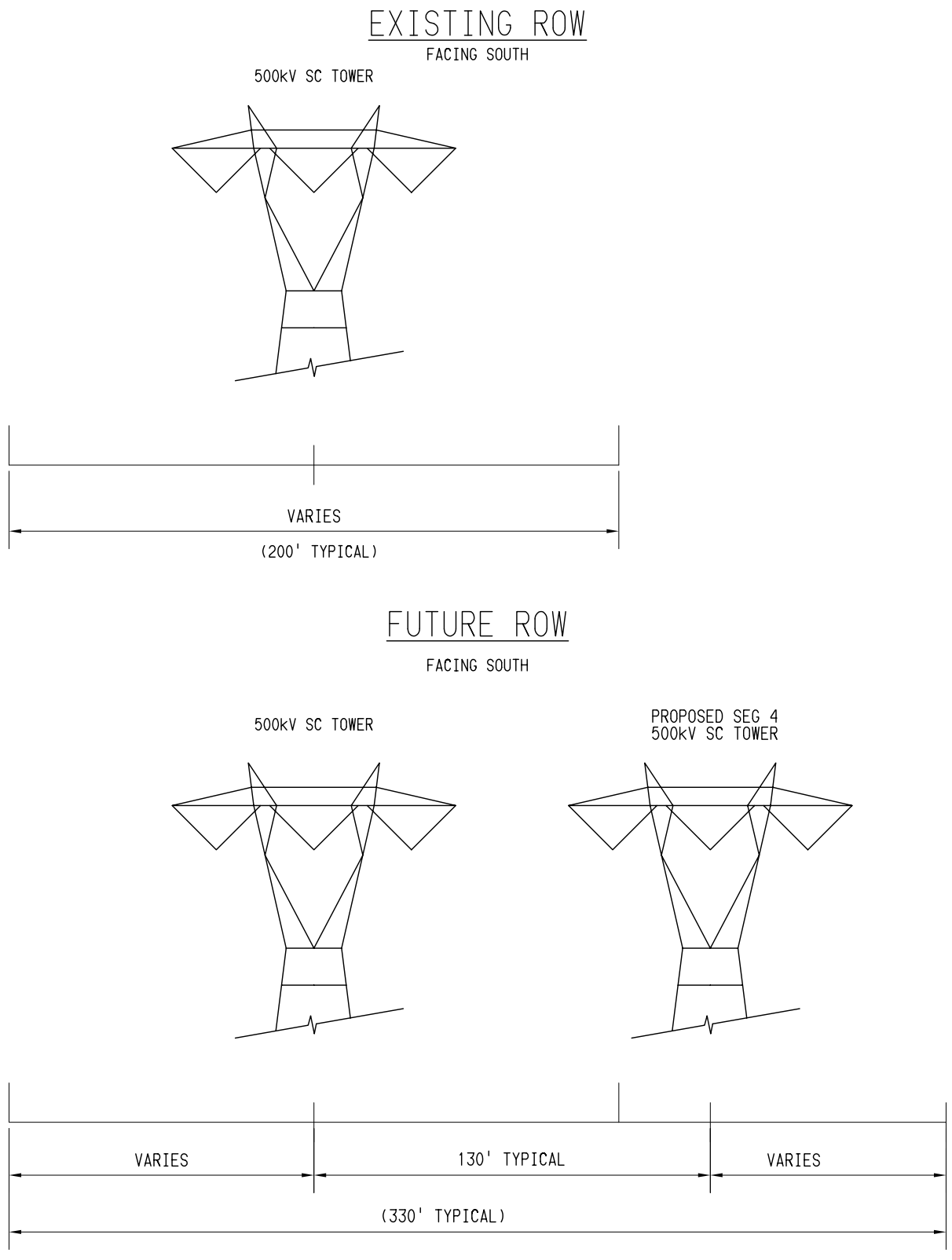
Source: SCE, 2007c.

Figure 2.2-2
Segment 4 ROW Cross-Section (S4 MP 0.0 to S4 MP 5.1)



Source: SCE, 2007c.

Figure 2.2-3
Segment 4 ROW Cross-Section (Northern Portion)



Source: SCE, 2007c.

Figure 2.2-4
Segment 4 ROW Cross-Section (Middle Portion)

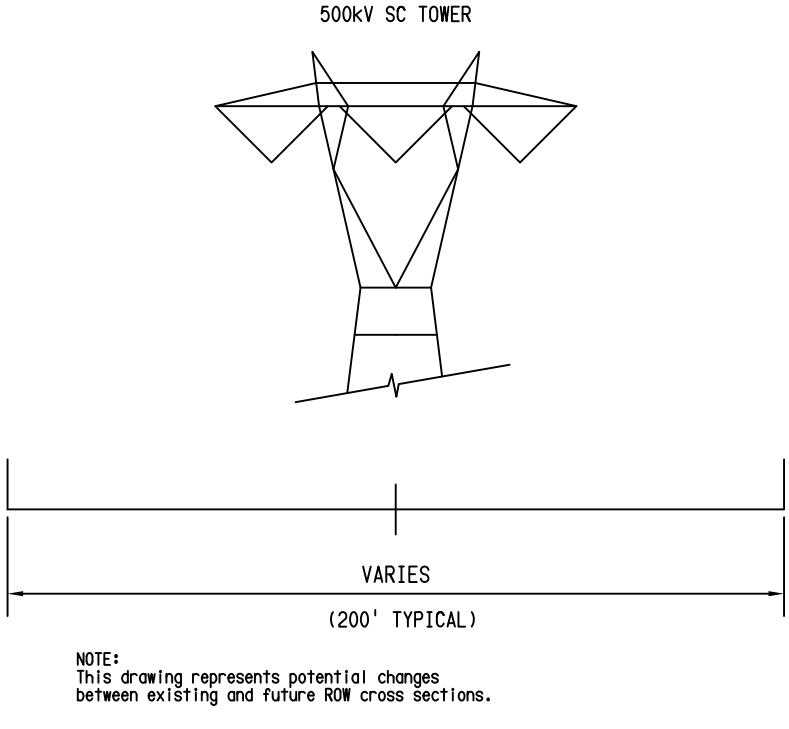
EXISTING ROW

FACING SOUTH

No Existing ROW

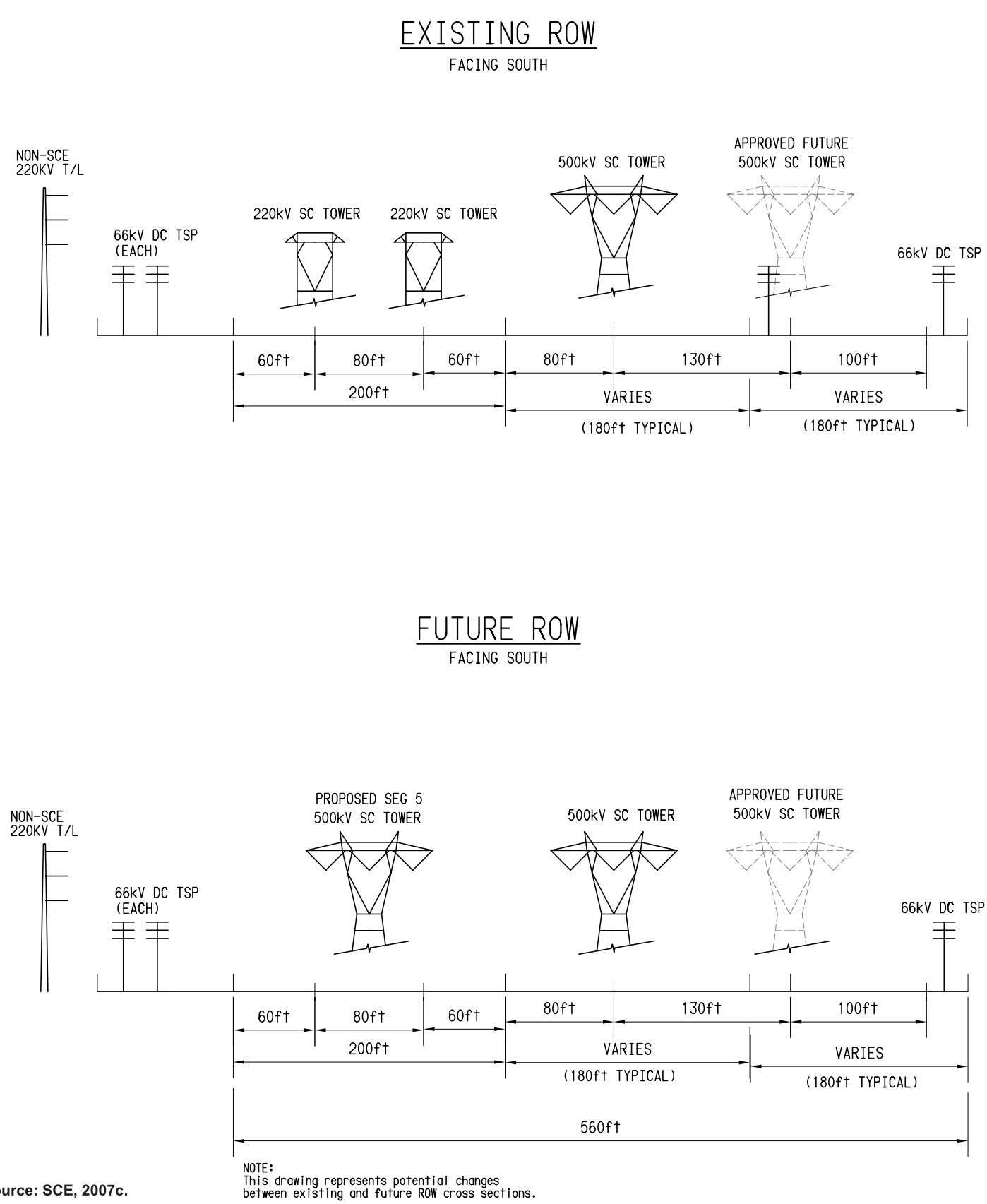
FUTURE ROW

FACING SOUTH



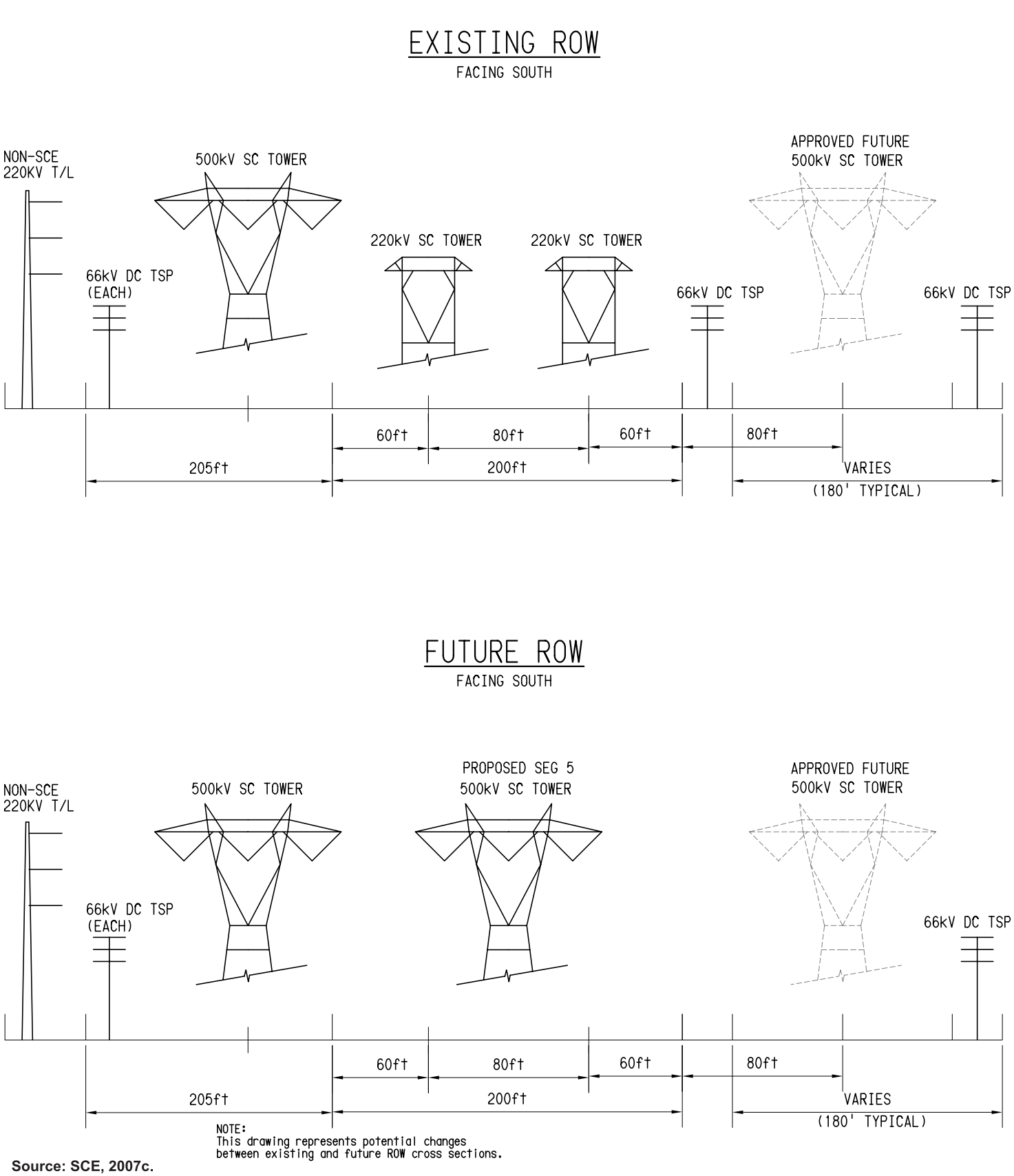
Source: SCE, 2007c.

Figure 2.2-5
Segment 4 ROW Cross-Section (Southern Portion)



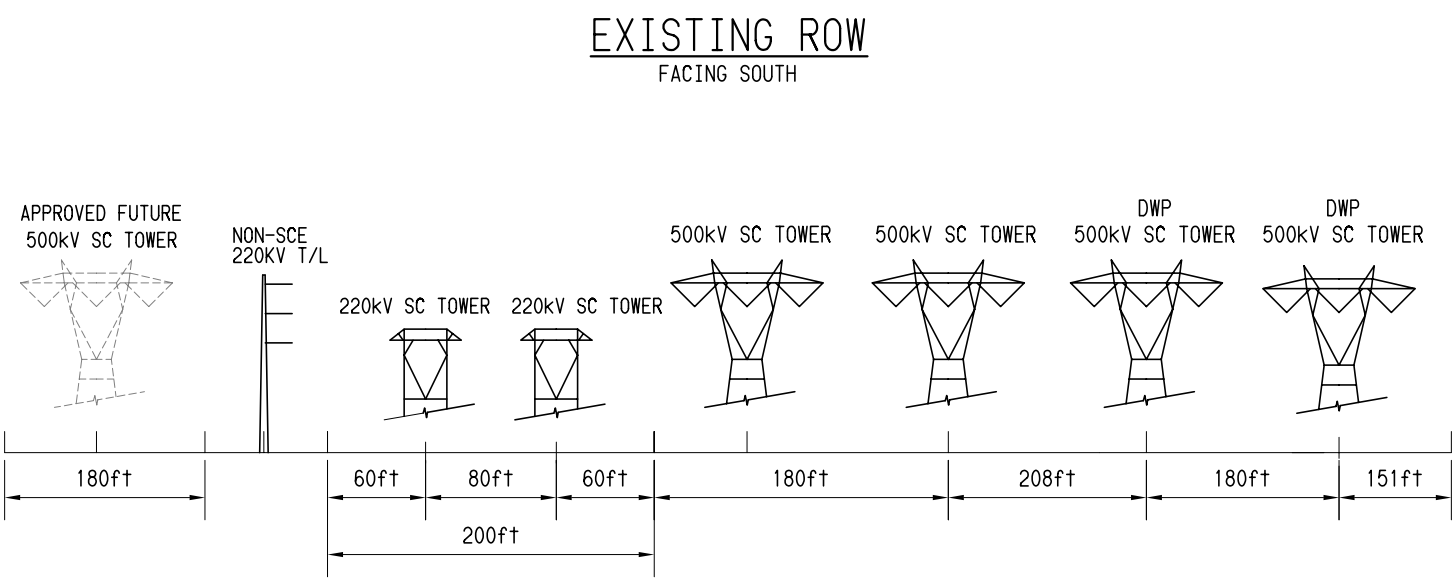
Source: SCE, 2007c.

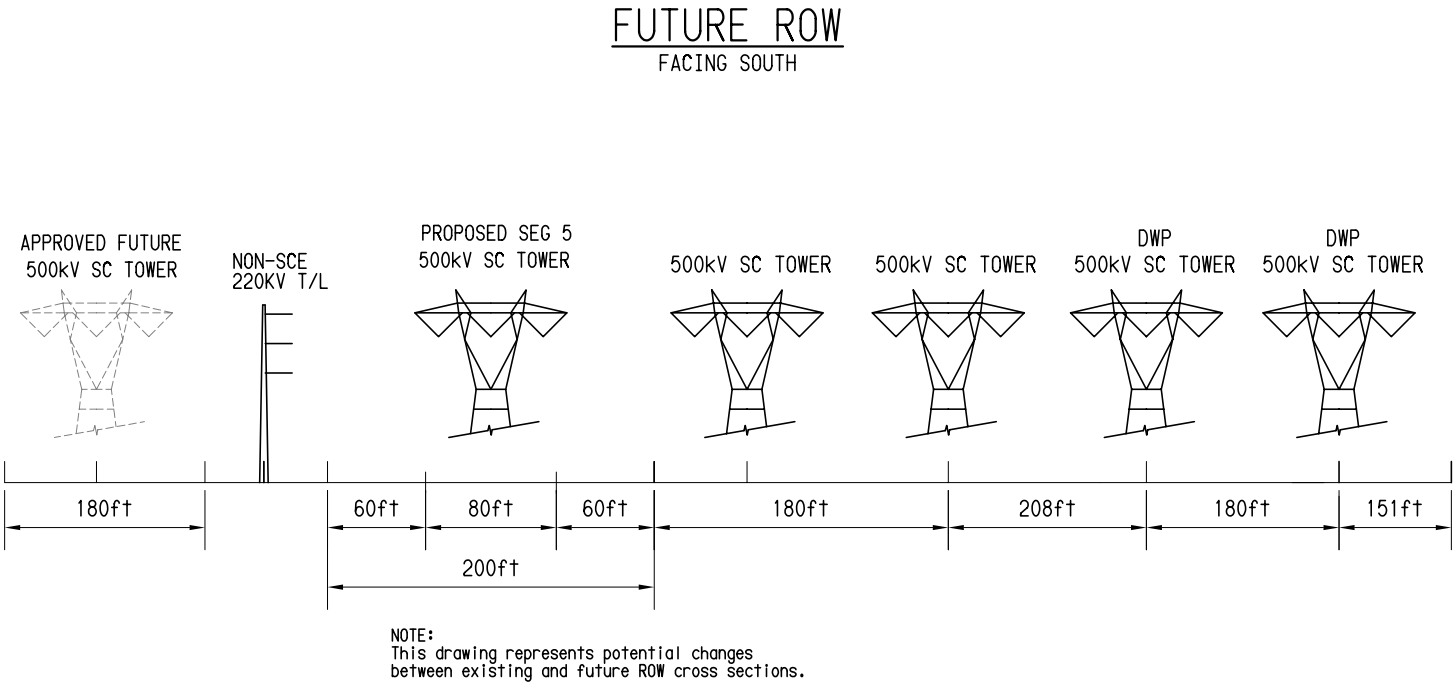
Figure 2.2-6
Segment 5 ROW Cross-Section (S5 MP 0.0 to S5 MP 1.85)



Source: SCE, 2007c.

Figure 2.2-7
Segment 5 ROW Cross-Section (S5 MP 1.85 to S5 MP 5.85)

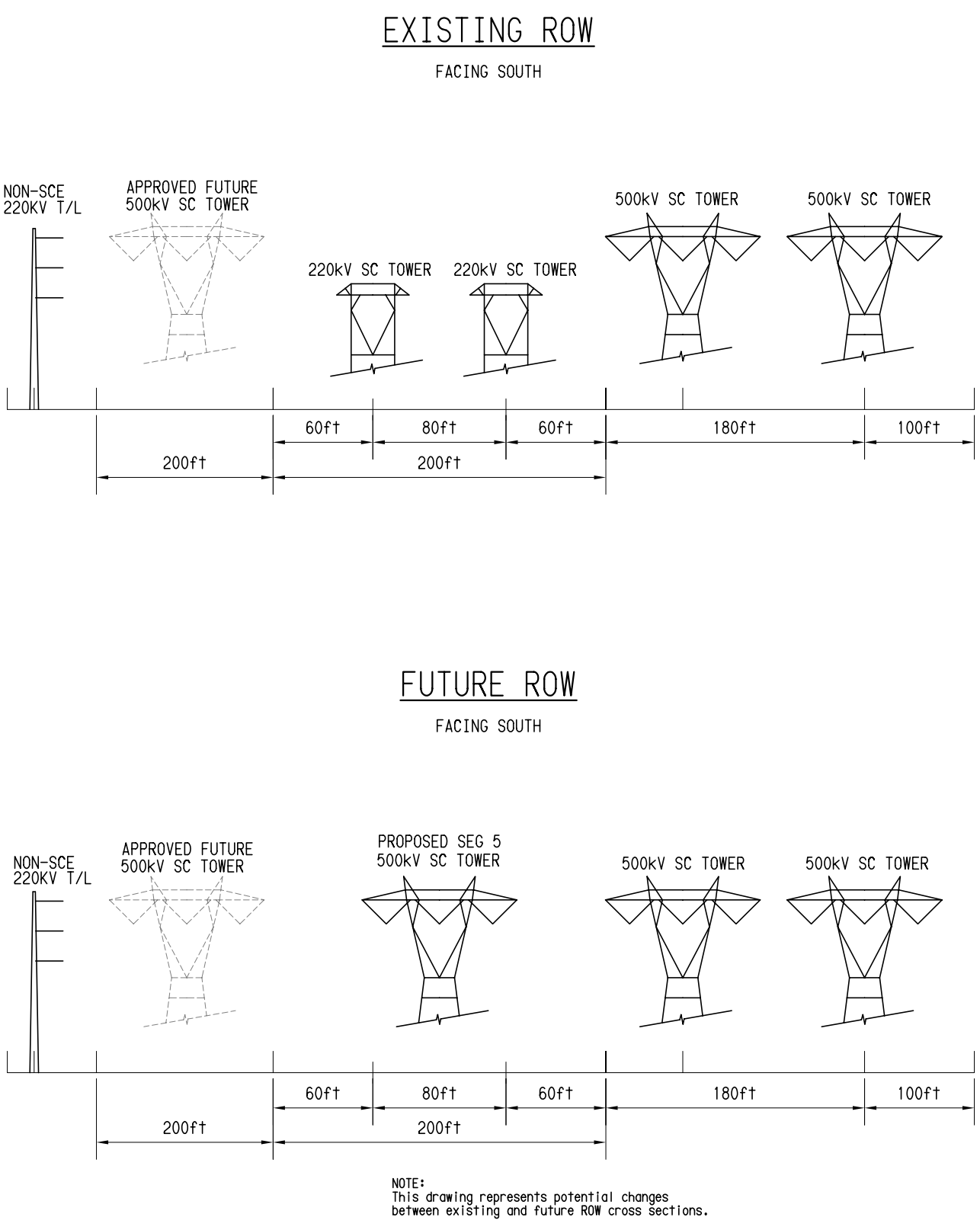




Source: SCE, 2007c.

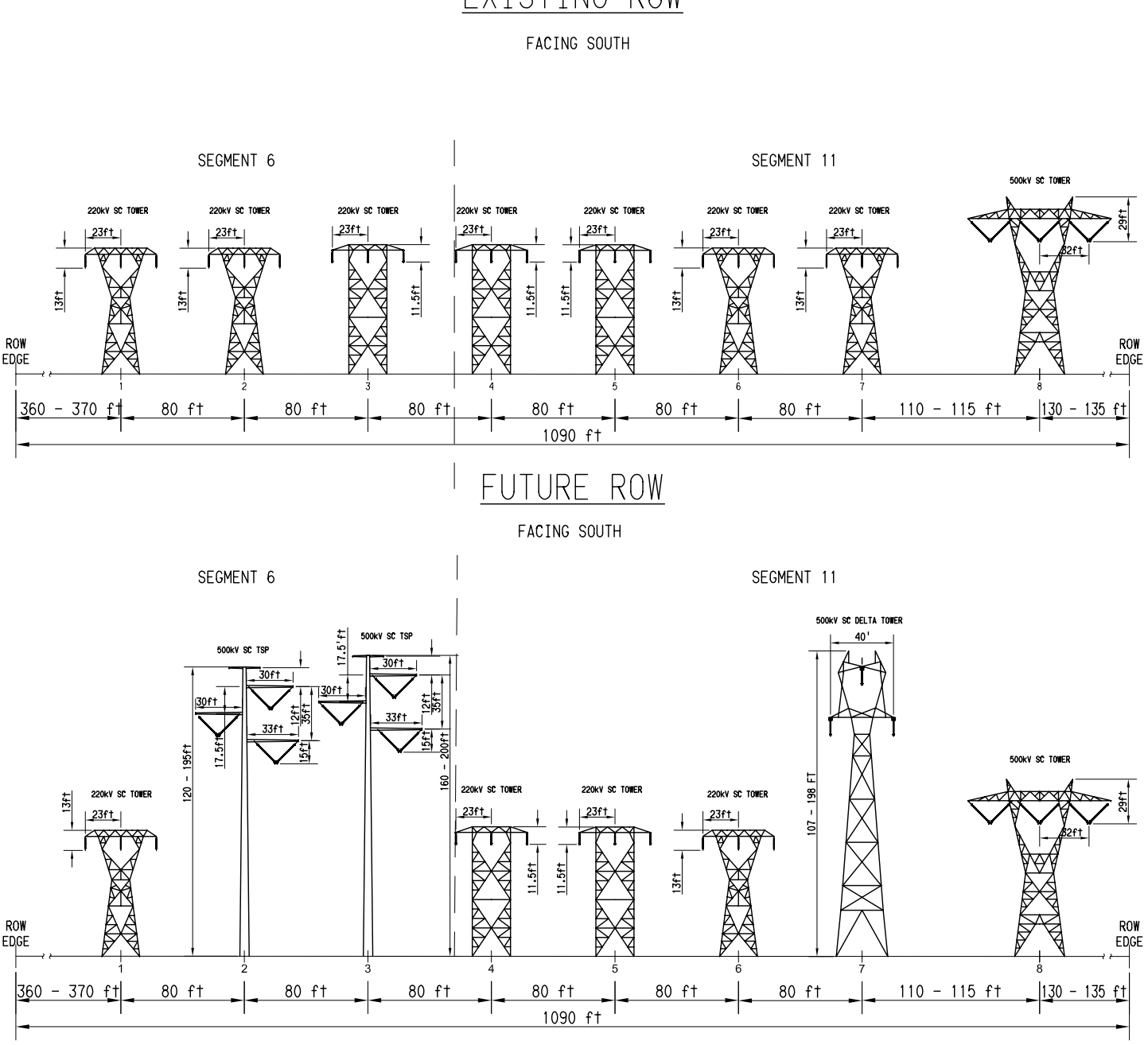
Figure 2.2-8

Segment 5 ROW Cross-Section (S5 MP 5.85 to S5 MP 15.9)



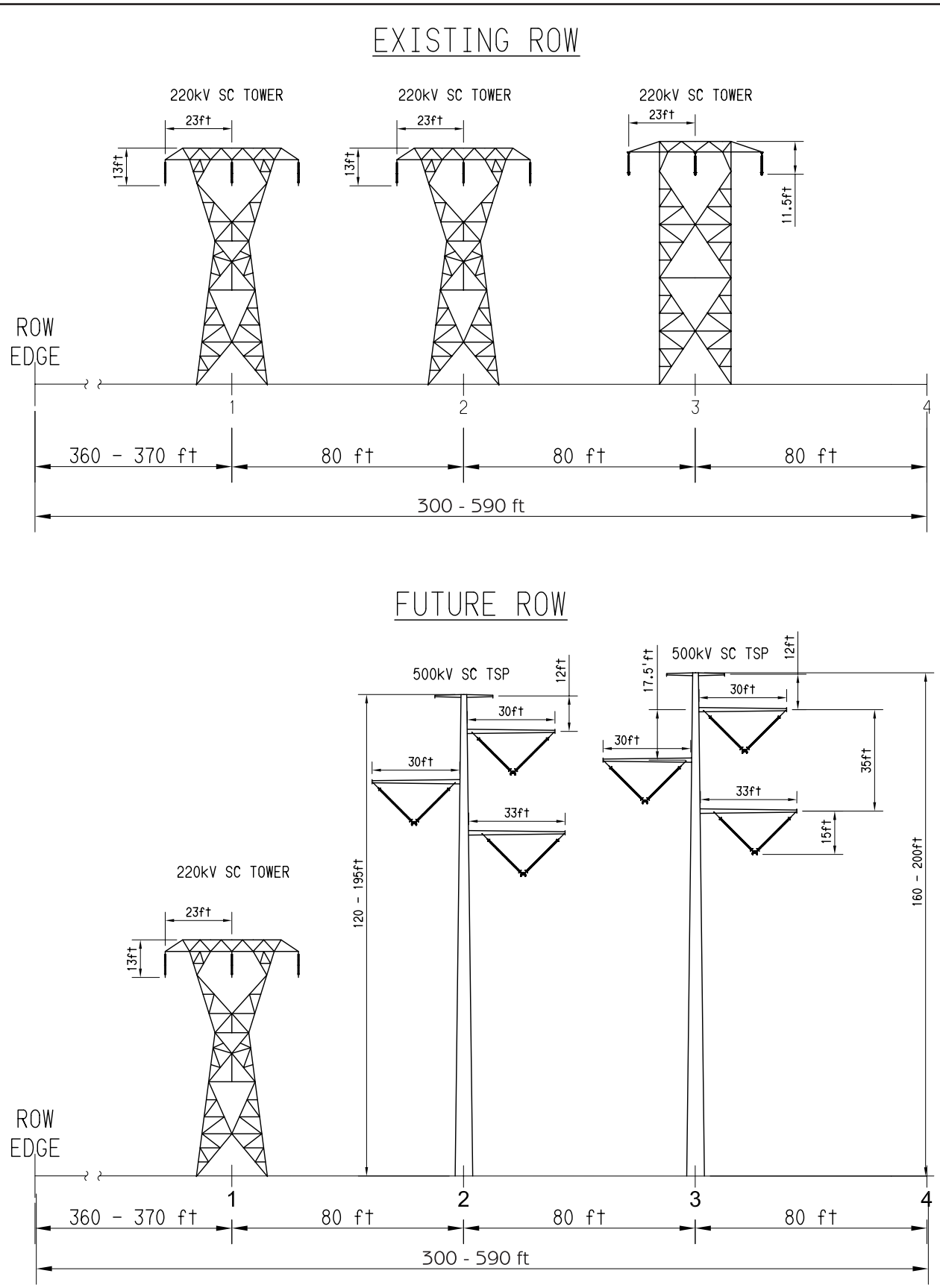
Source: SCE, 2007c.

Figure 2.2-9
Segment 5 ROW Cross-Section (S5 MP 15.9 to S5 MP 17.8)



Source: SCE, 2007c.

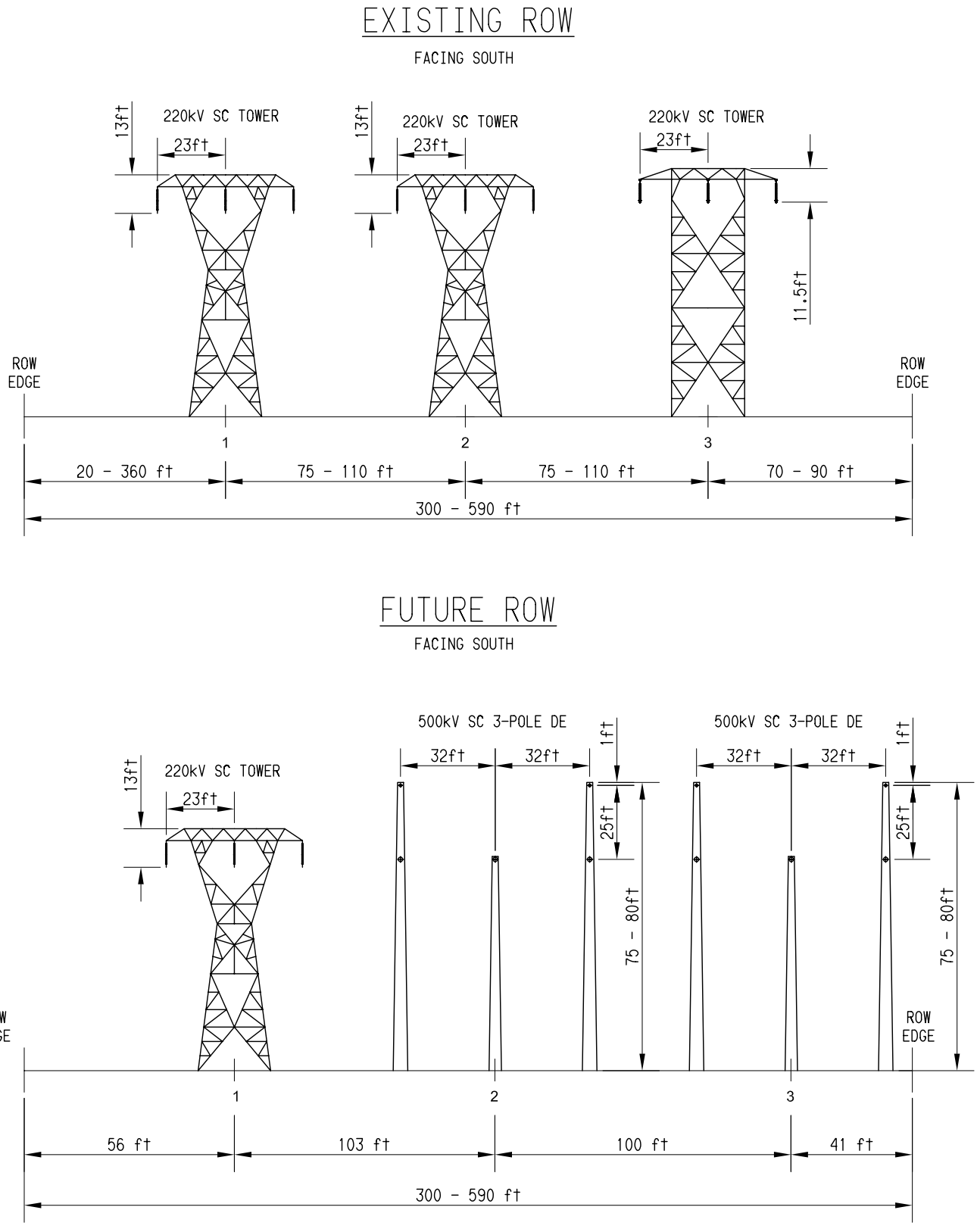
Figure 2.2-10
Segment 6 ROW Cross-Section (S6 MP 0.0 to S6 MP 0.8)



NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Source: SCE, 2007c.

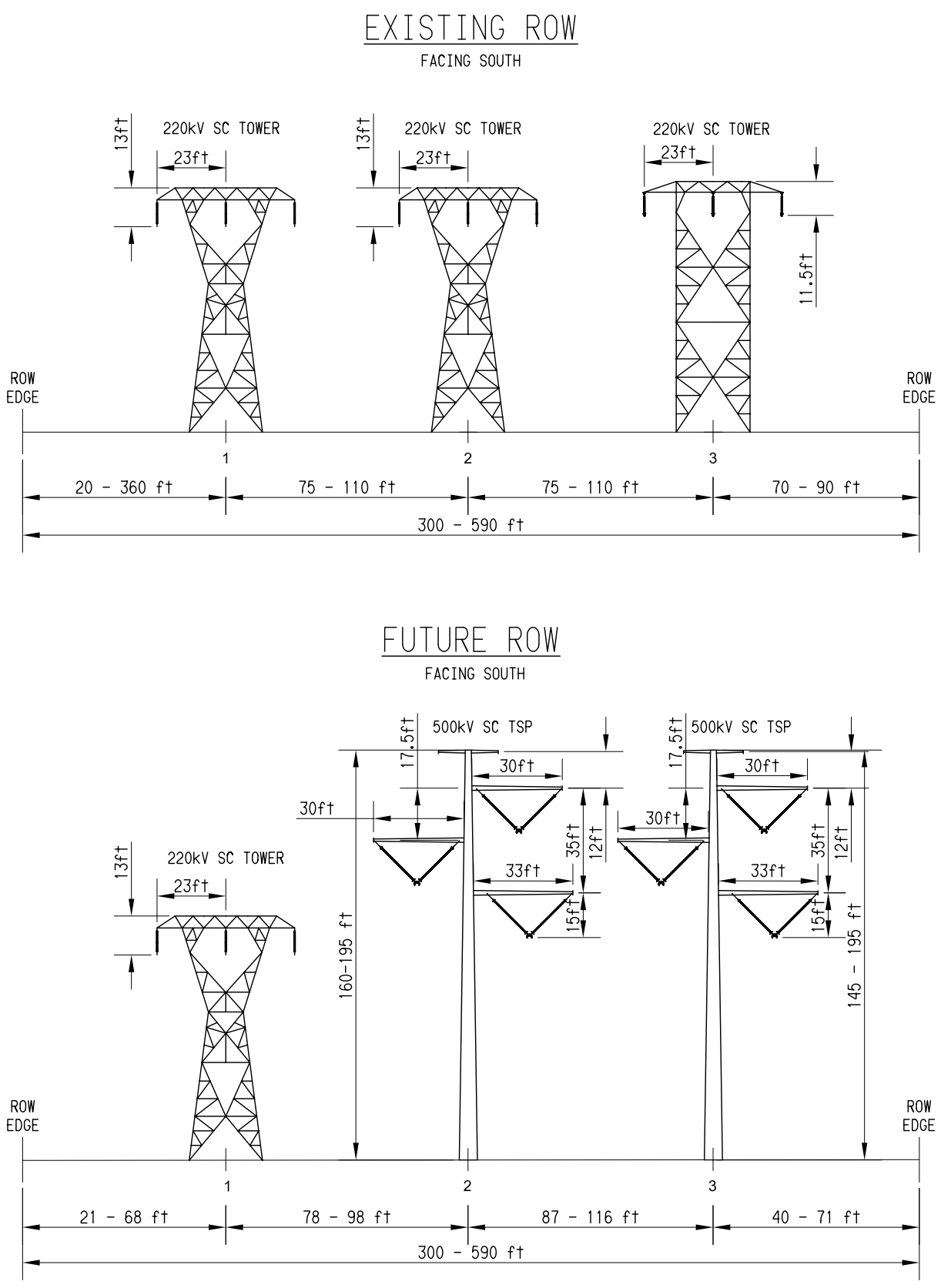
Figure 2.2-11
Segment 6 ROW Cross-Section (S6 MP 0.8 to S6 MP 2.2)



Source: SCE, 2007c.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Figure 2.2-12
Segment 6 ROW Cross-Section (S6 MP 2.2 to S6 MP 2.45)



Source: SCE, 2007c.

NOTE:
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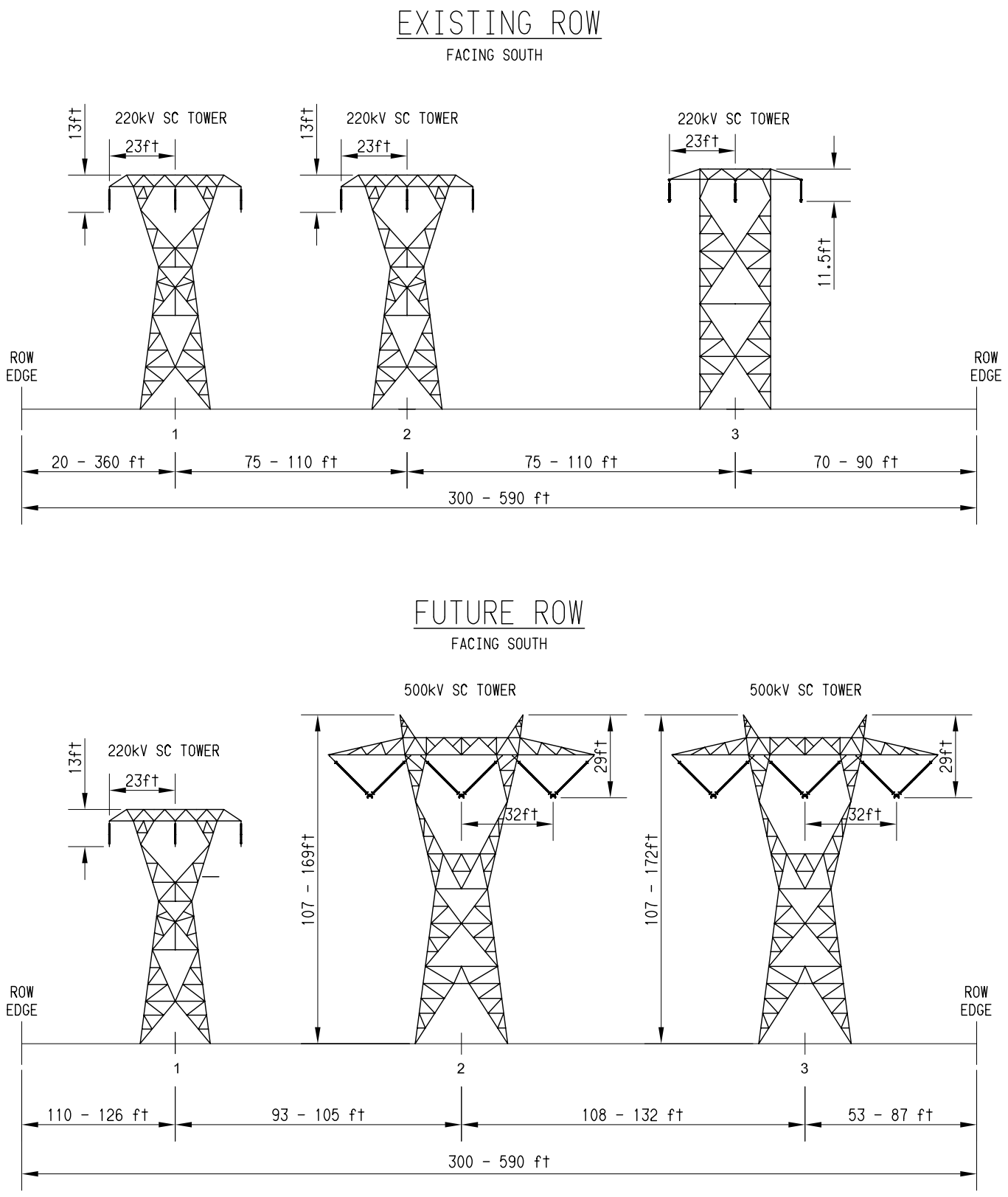
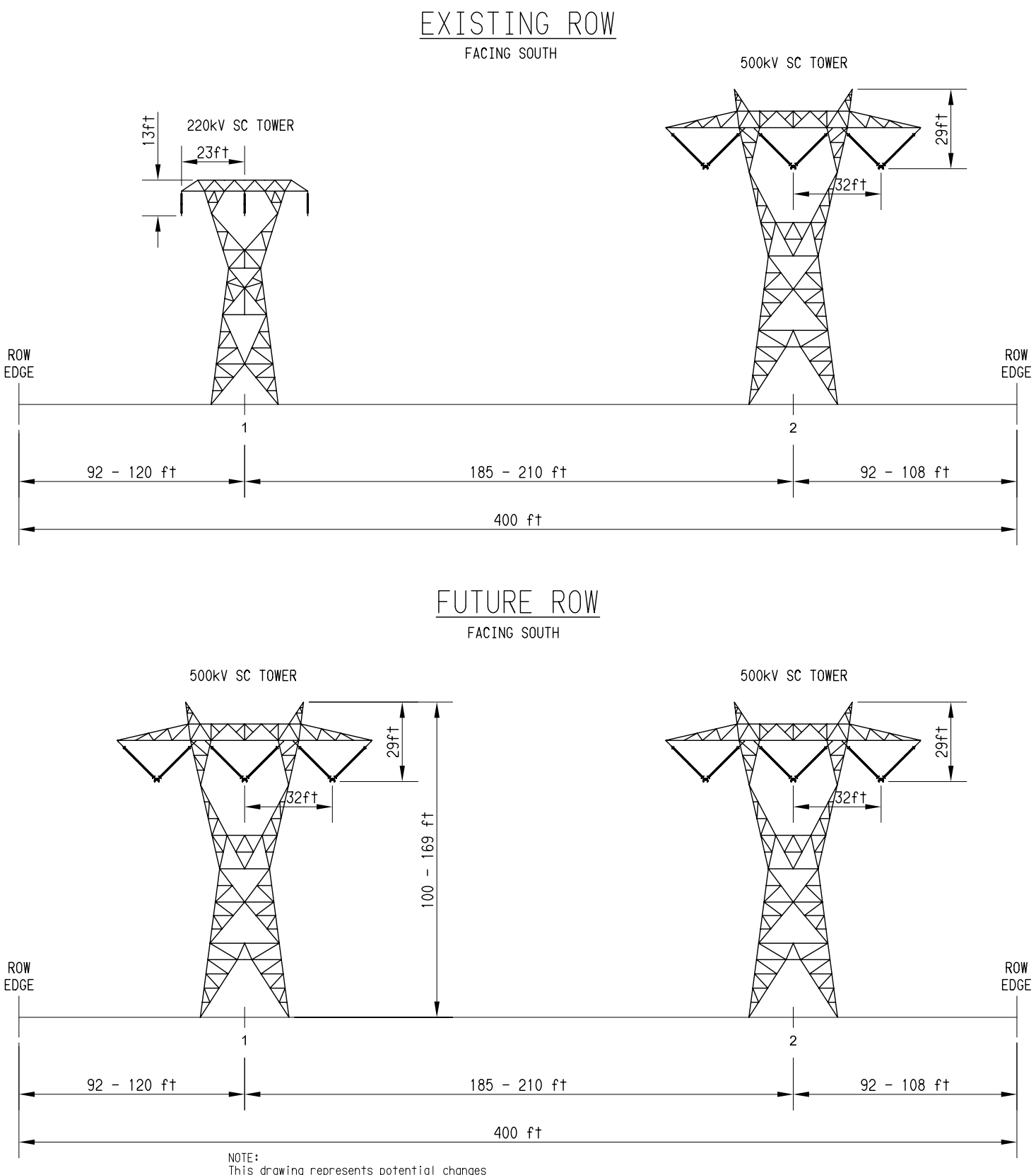
Figure 2.2-13
Segment 6 ROW Cross-Section (S6 MP 2.45 to S6 MP 3.25)



Source: SCE, 2007c.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

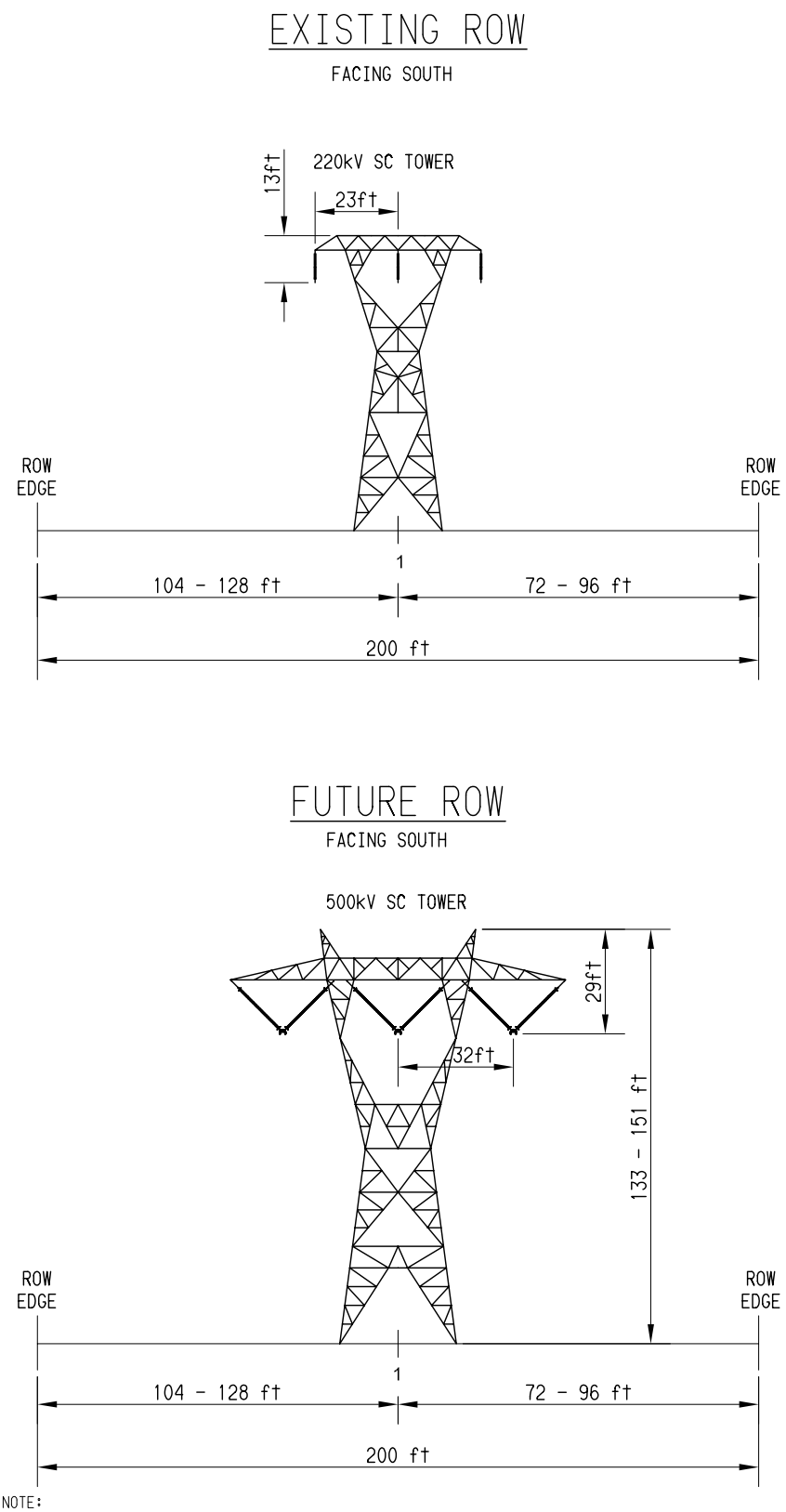
Figure 2.2-14
Segment 6 ROW Cross-Section (S6 MP 3.25 to S6 MP 4.8)



Source: SCE, 2007c.

Note: There are currently three existing T/Ls in the utility corridor. Not all are shown in this cross-section diagram, as one or more T/Ls veer away from the TRTP T/L and therefore fall outside of the area depicted.

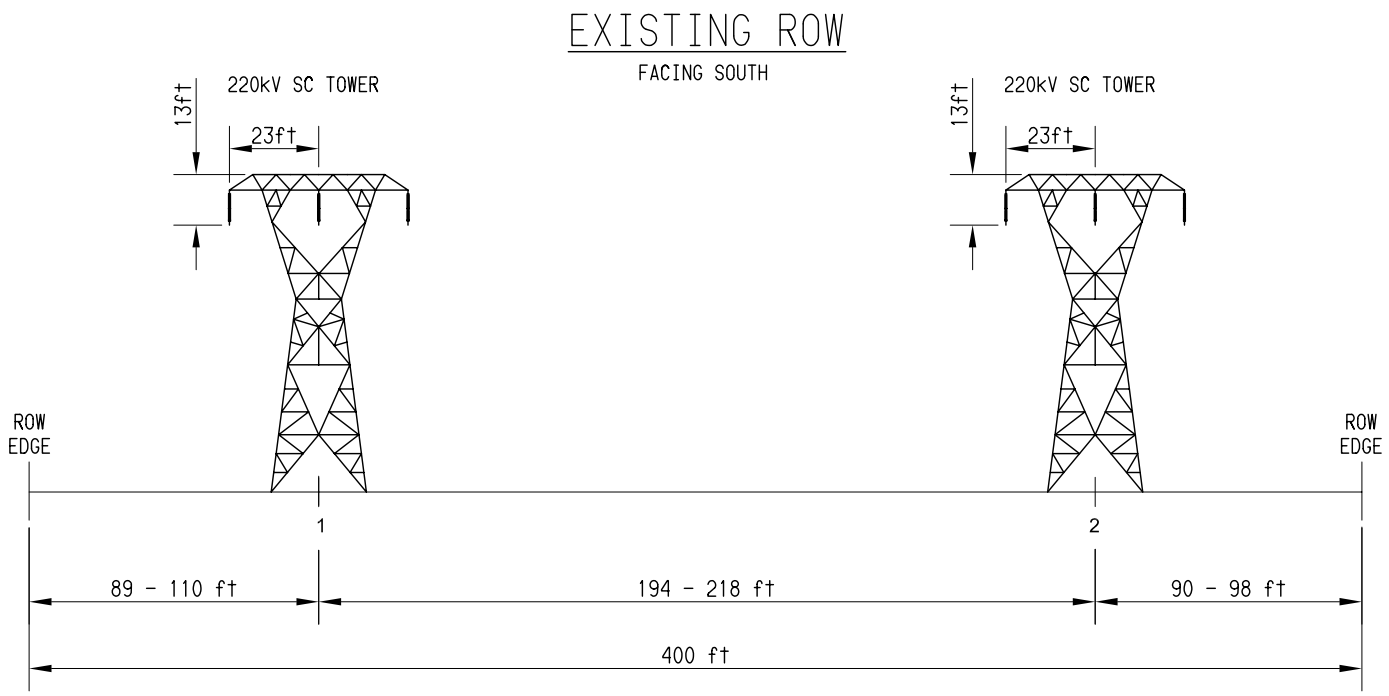
Figure 2.2-15 (Revised)
Segment 6 ROW Cross-Section (S6 MP 4.8 to S6 MP 6.85)

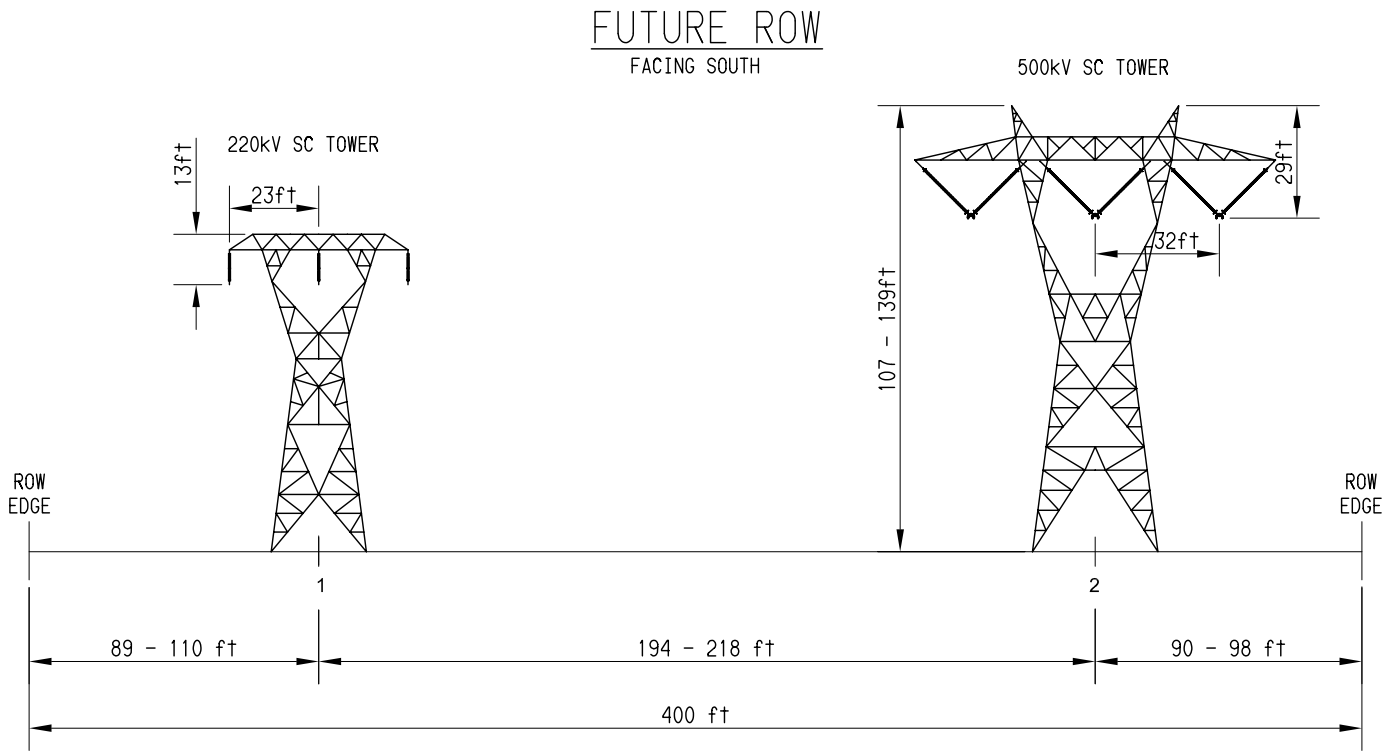


Source: SCE, 2007c.

Note: There are currently three existing T/Ls in the utility corridor. Not all are shown in this cross-section diagram, as one or more T/Ls veer away from the TRTP T/L and therefore fall outside of the area depicted.

Figure 2.2-16 (Revised)
Segment 6 ROW Cross-Section (S6 MP 6.85 to S6 MP 7.75)





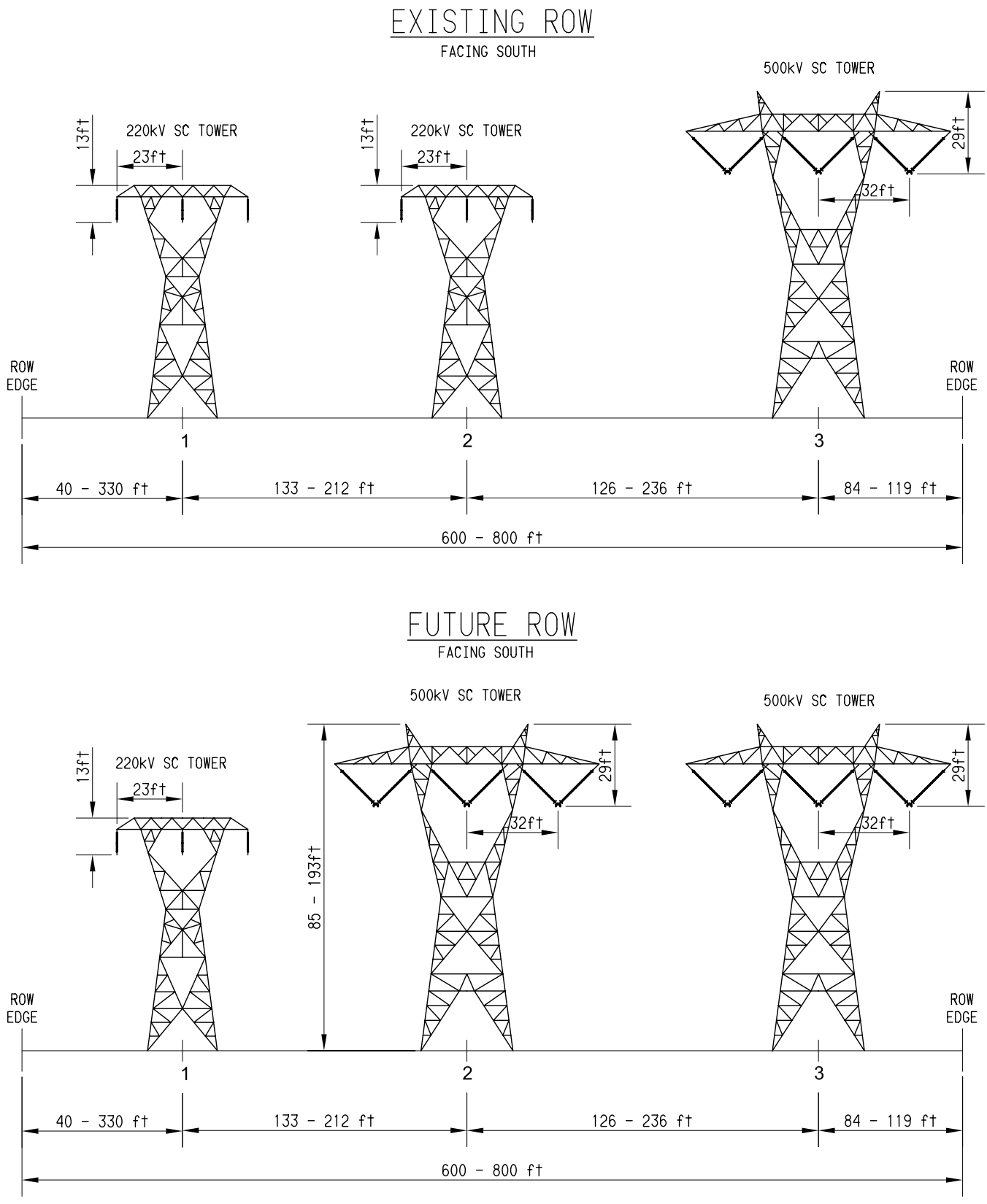
NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Source: SCE, 2007c.

Aspen Environmental Group

Note: There are currently three existing T/Ls in the utility corridor. Not all are shown in this cross-section diagram, as one or more T/Ls veer away from the TRTP T/L and therefore fall outside of the area depicted.

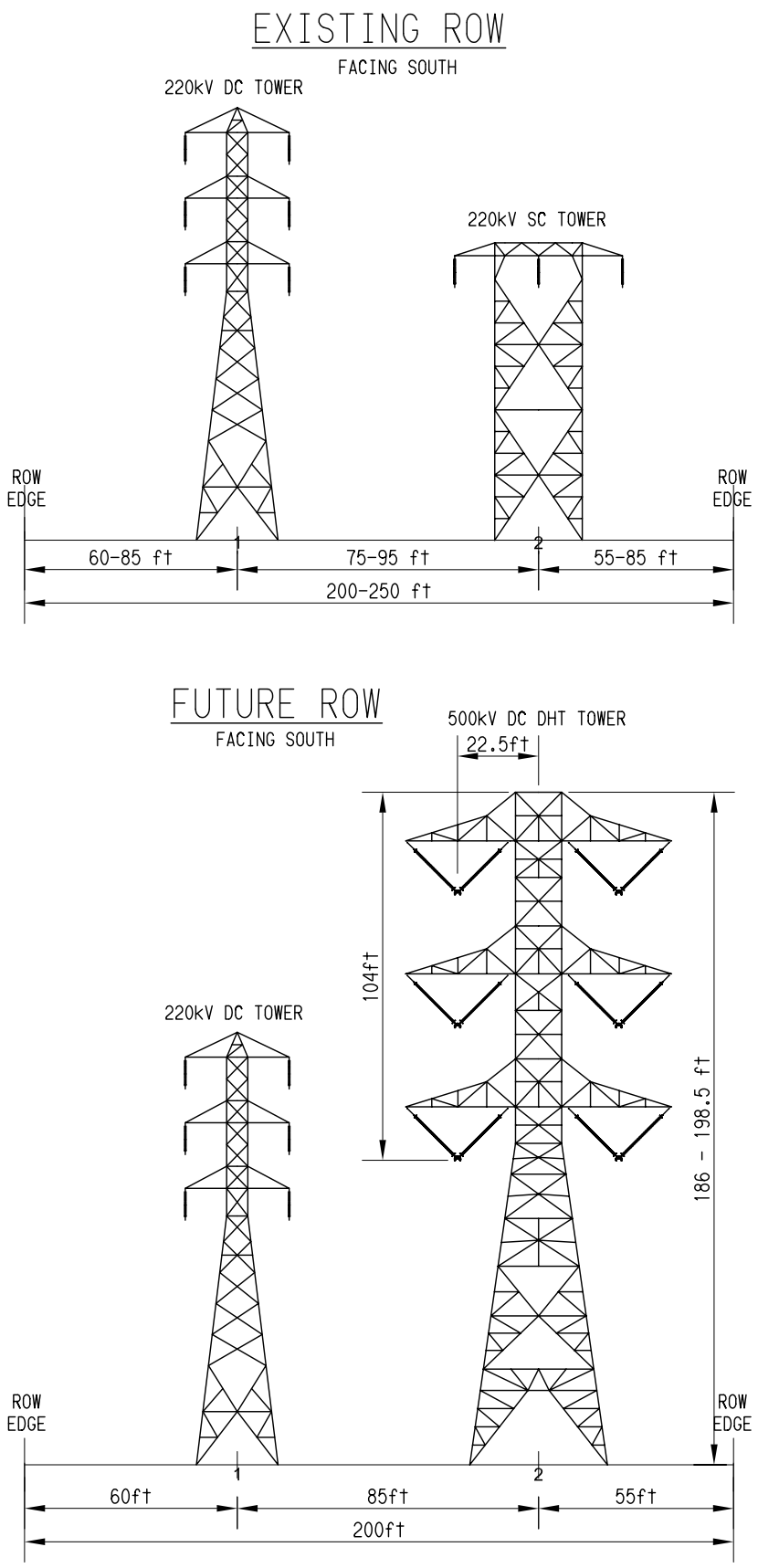
Figure 2.2-17 (Revised)
Segment 6 ROW Cross-Section (S6 MP 7.75 to S6 MP 9.5)



Source: SCE, 2007c.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

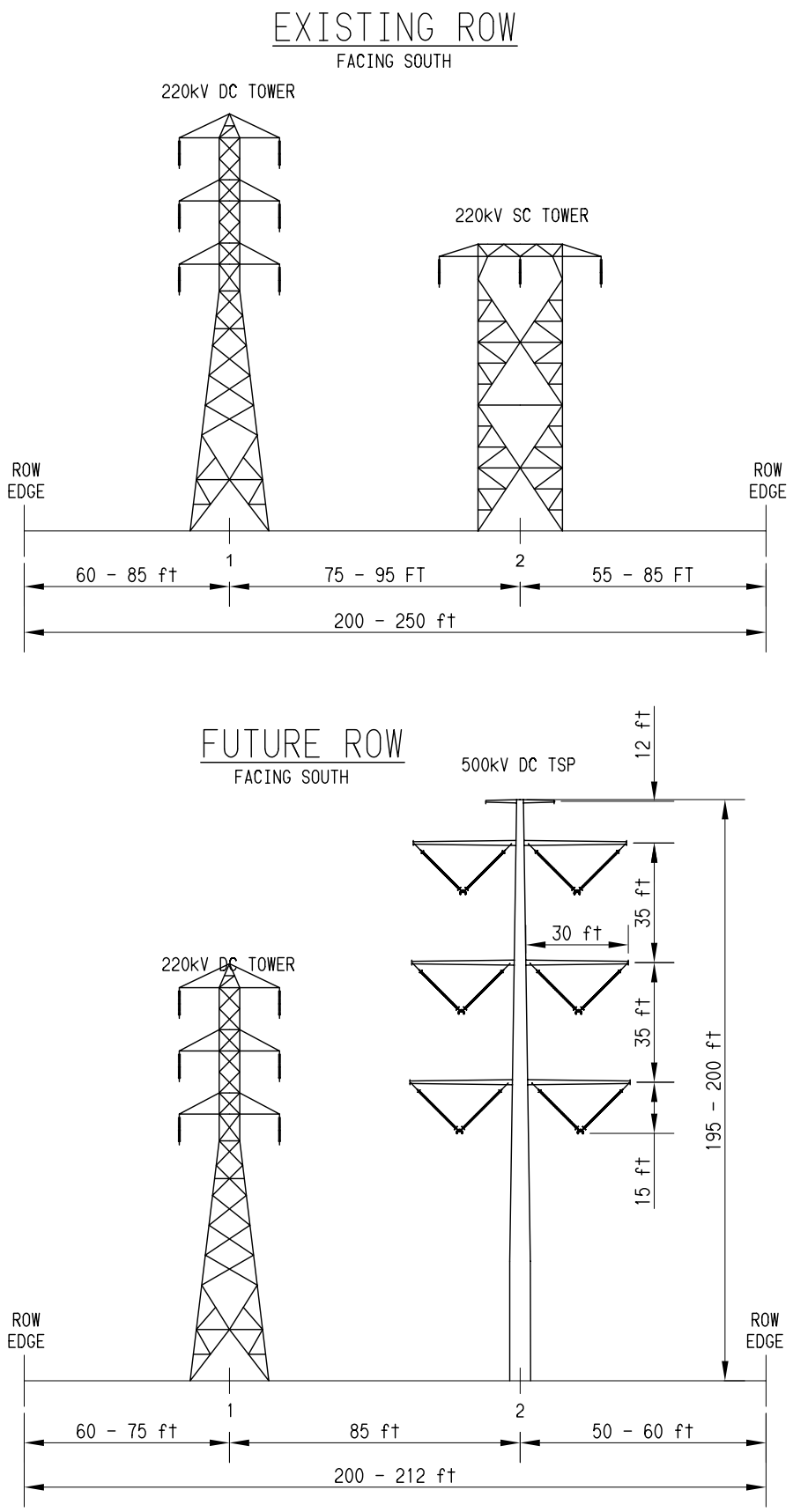
Figure 2.2-18
Segment 6 ROW Cross-Section (S6 MP 9.5 to S6 MP 26.9)



Source: SCE, 2008p.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

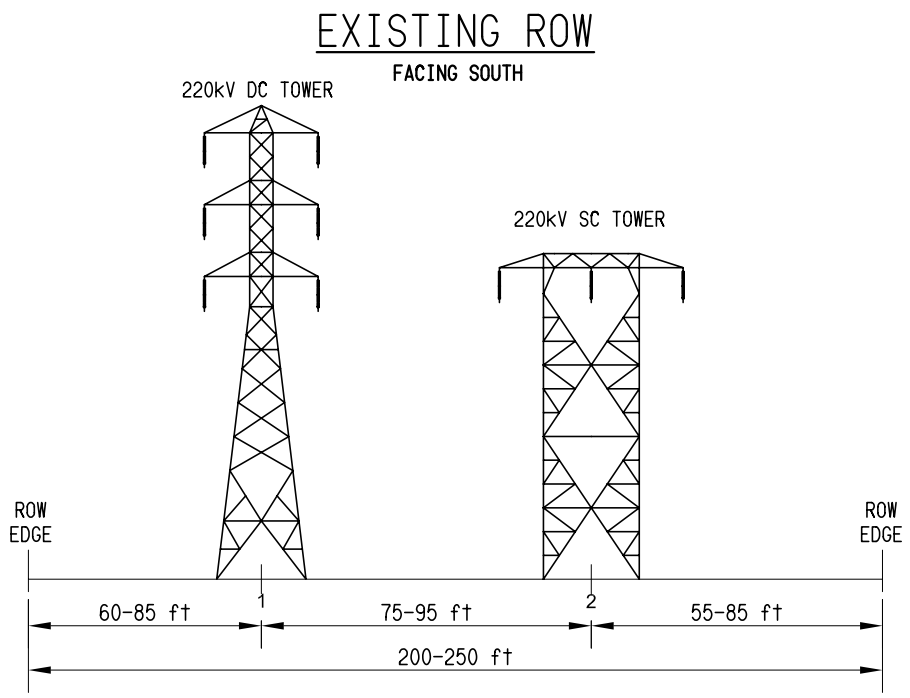
Figure 2.2-19
Segment 7 ROW Cross-Section (S7 MP 1.0 to S7 MP 1.2)

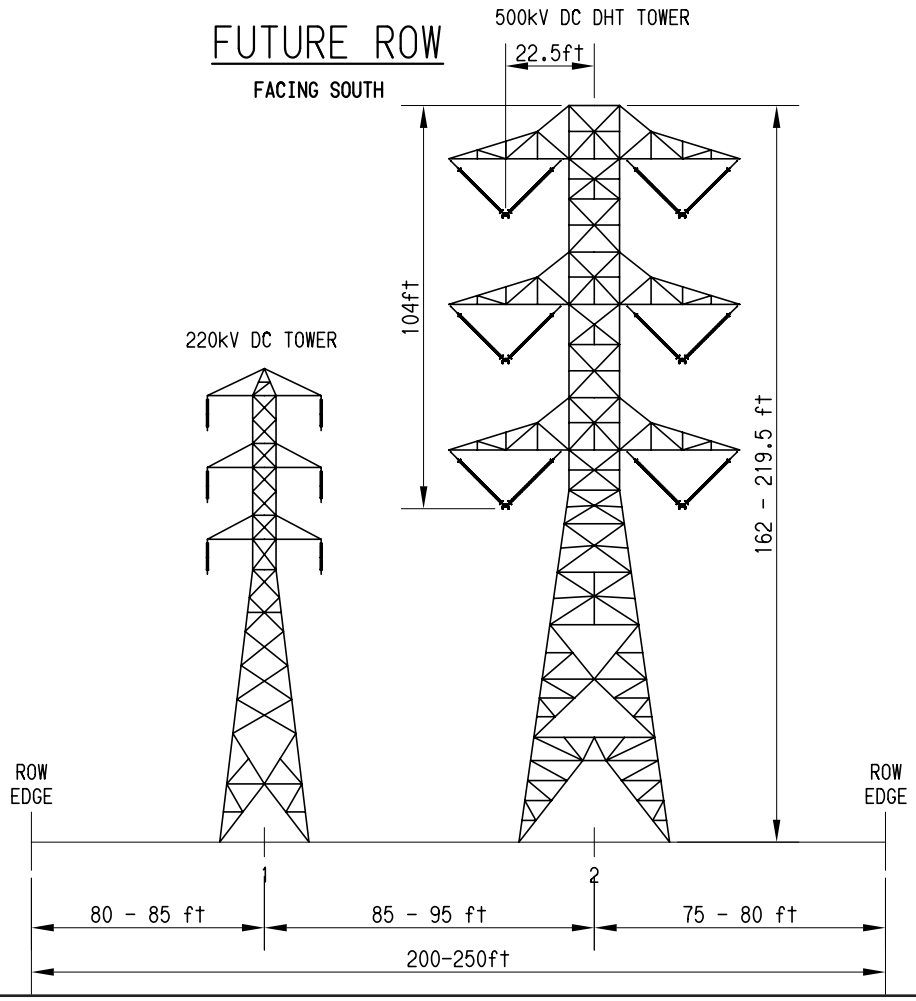


Source: SCE, 2007c.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Figure 2.2-20
Segment 7 ROW Cross-Section (S7 MP 1.2 to S7 MP 1.7)

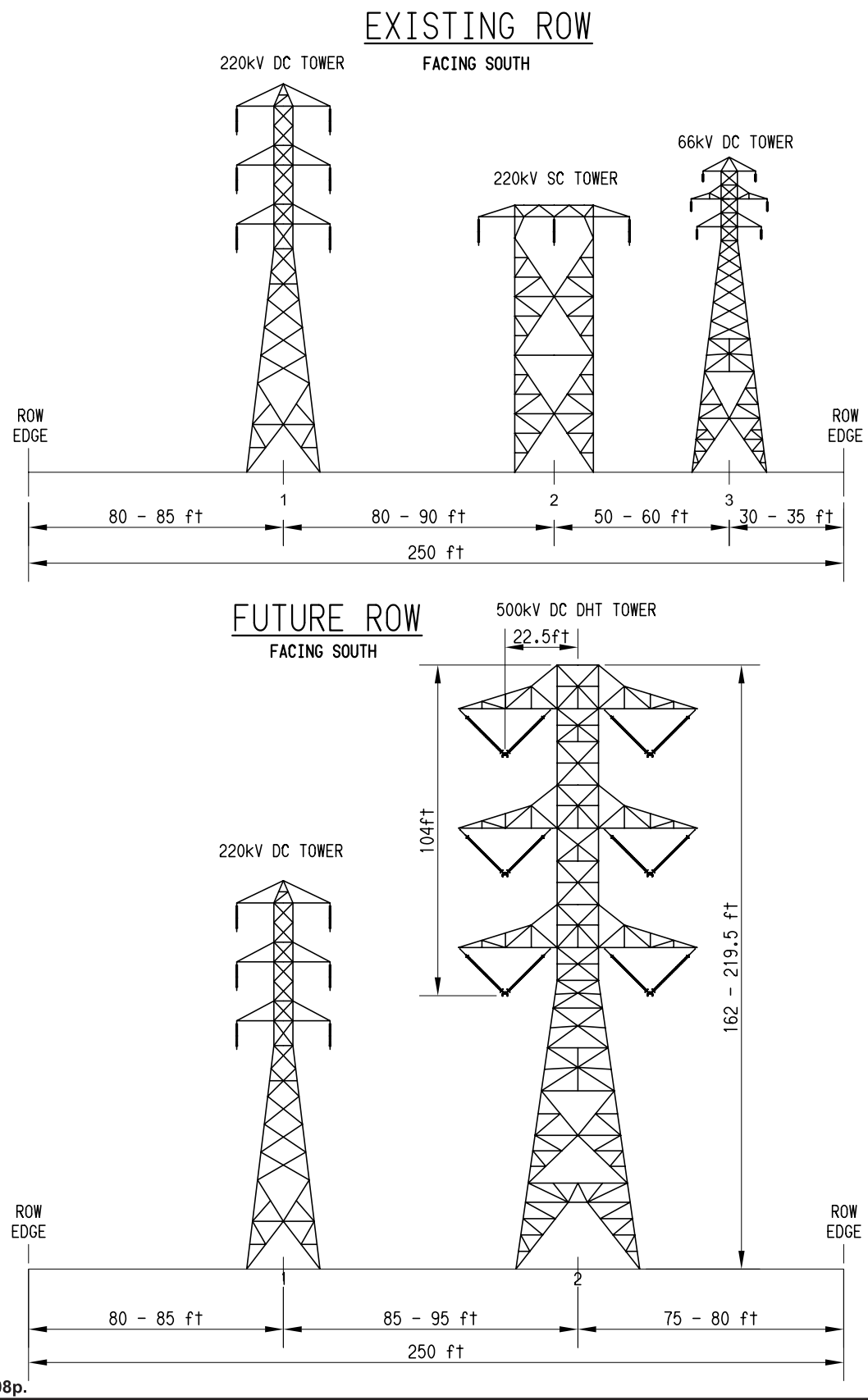




Source: SCE, 2007c.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

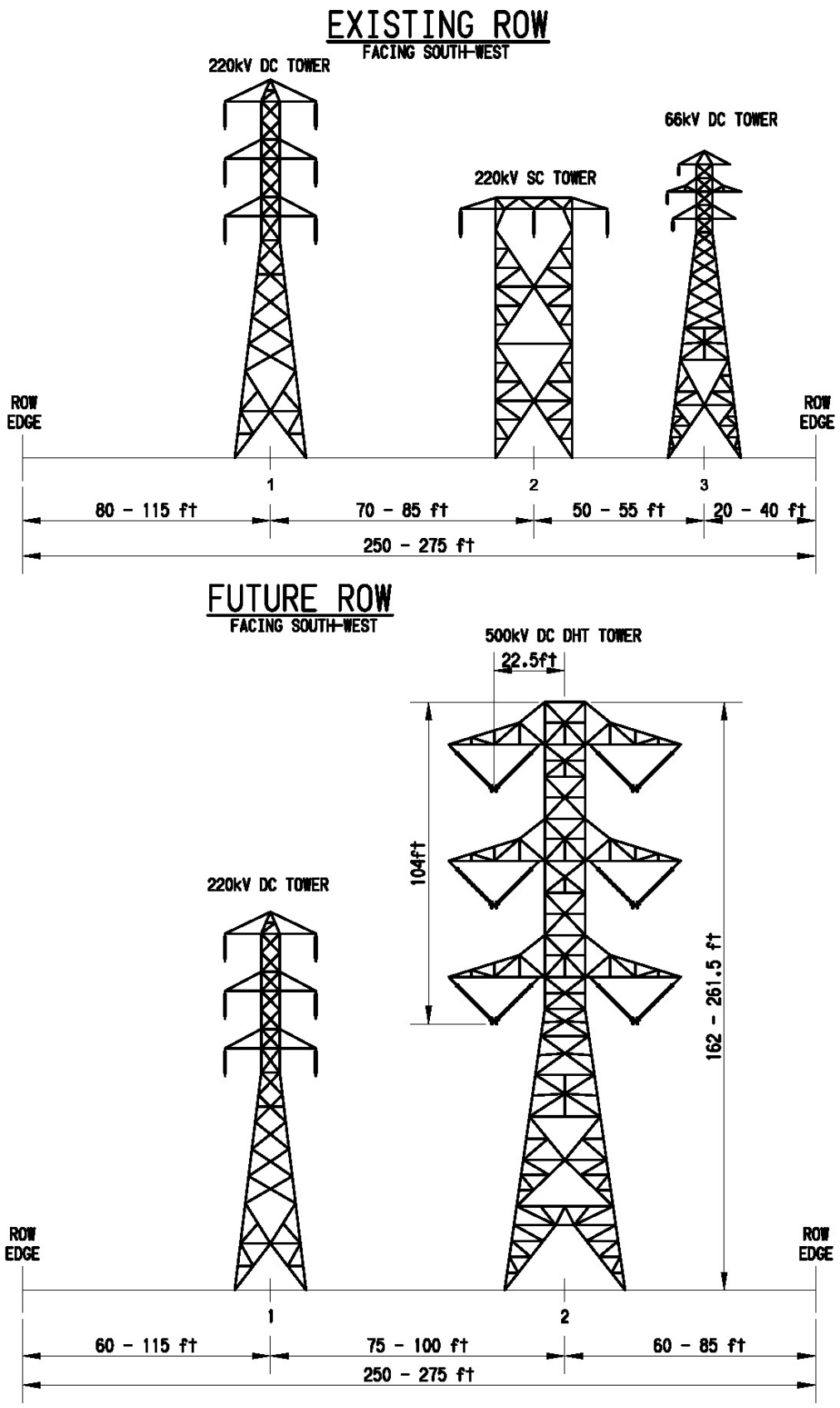
Figure 2.2-21
Segment 7 ROW Cross-Section (S7 MP 1.7 to S7 MP 4.3)



Source: SCE, 2008p.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

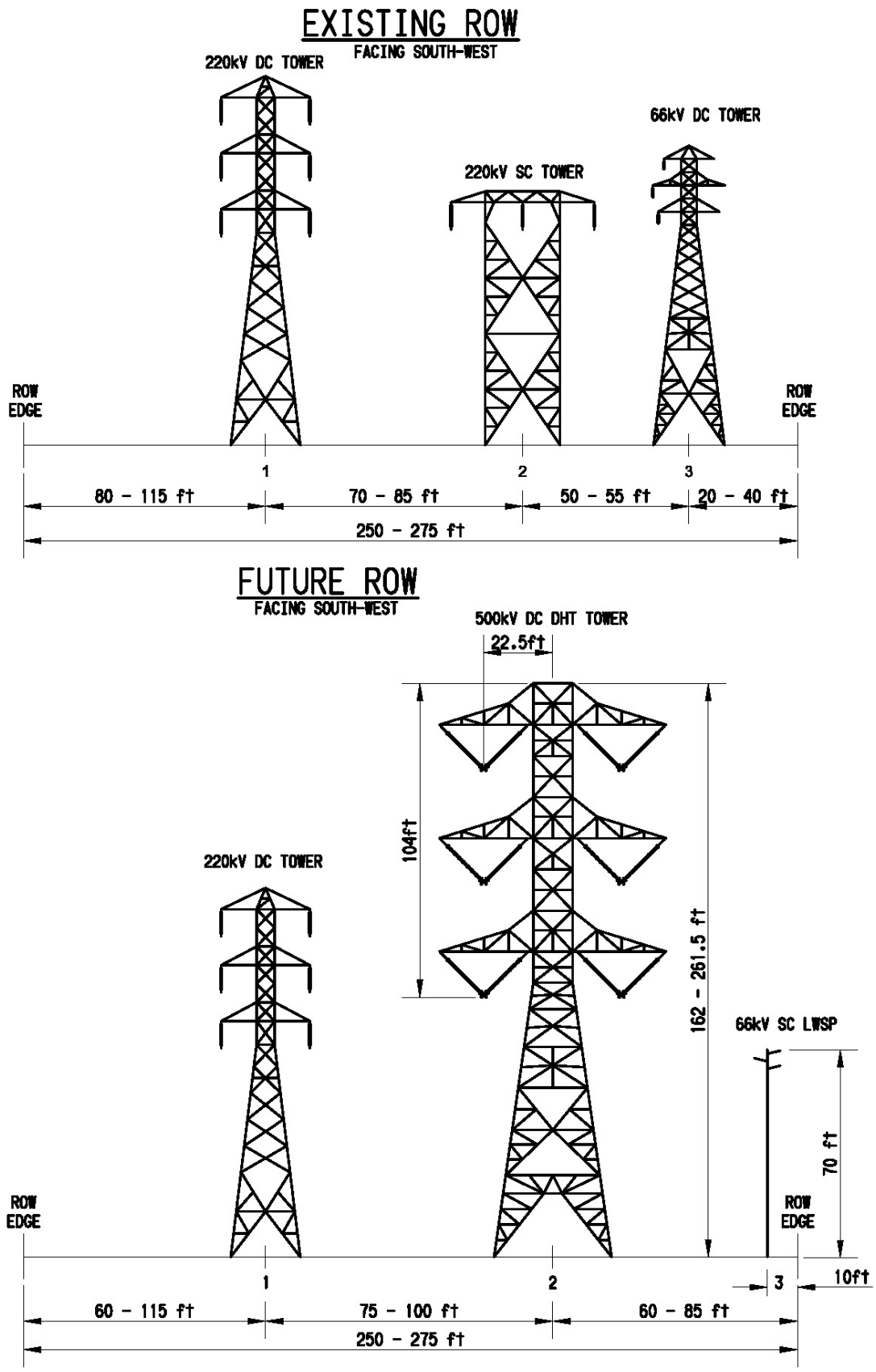
Figure 2.2-22
Segment 7 ROW Cross-Section (S7 MP 4.3 to S7 MP 5.1)



Source: SCE, 2008p.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

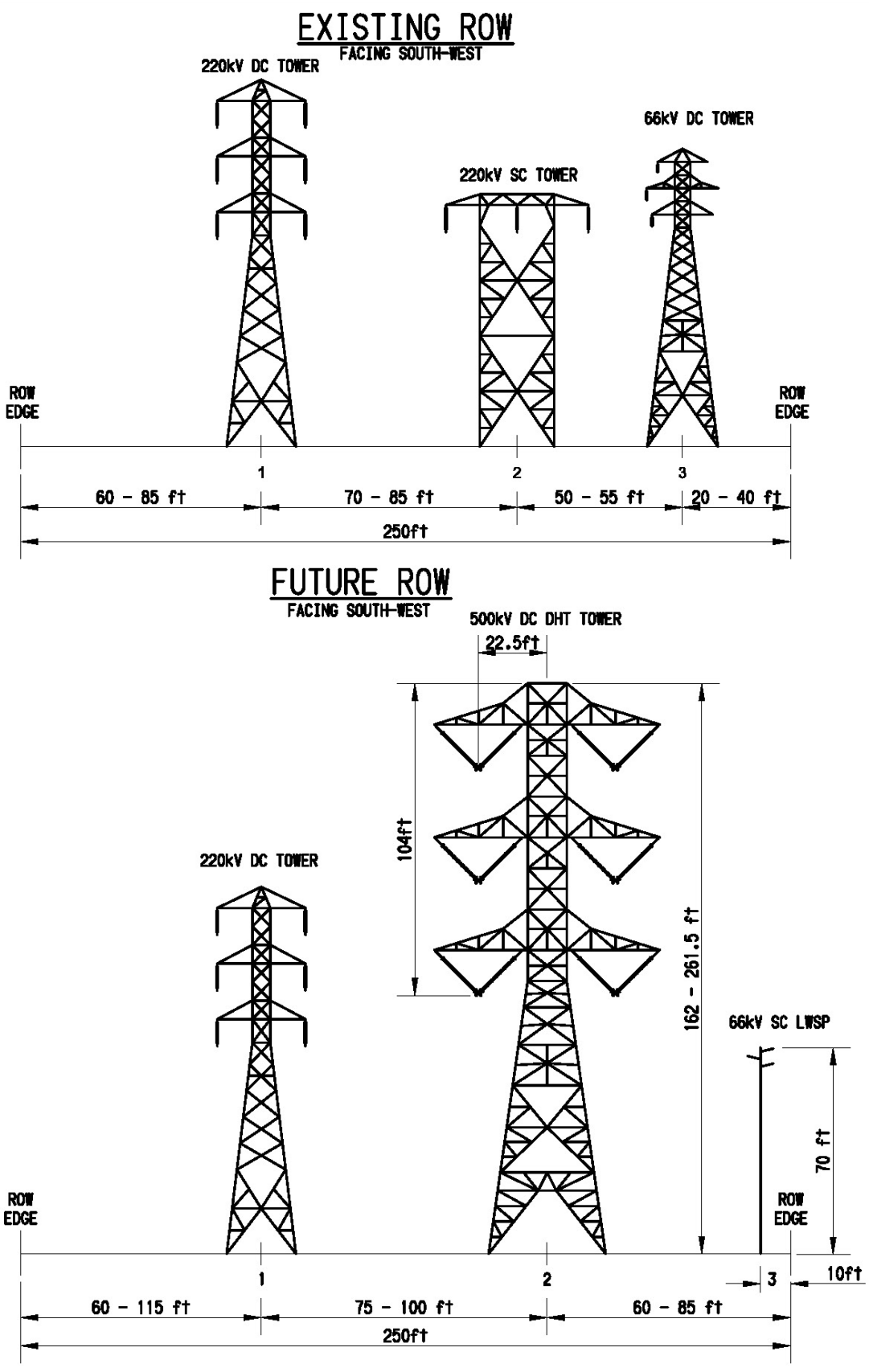
Figure 2.2-23a
Segment 7 ROW Cross-Section (S7 MP 5.1 to S7 MP 8.3)



Source: SCE, 2008p.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

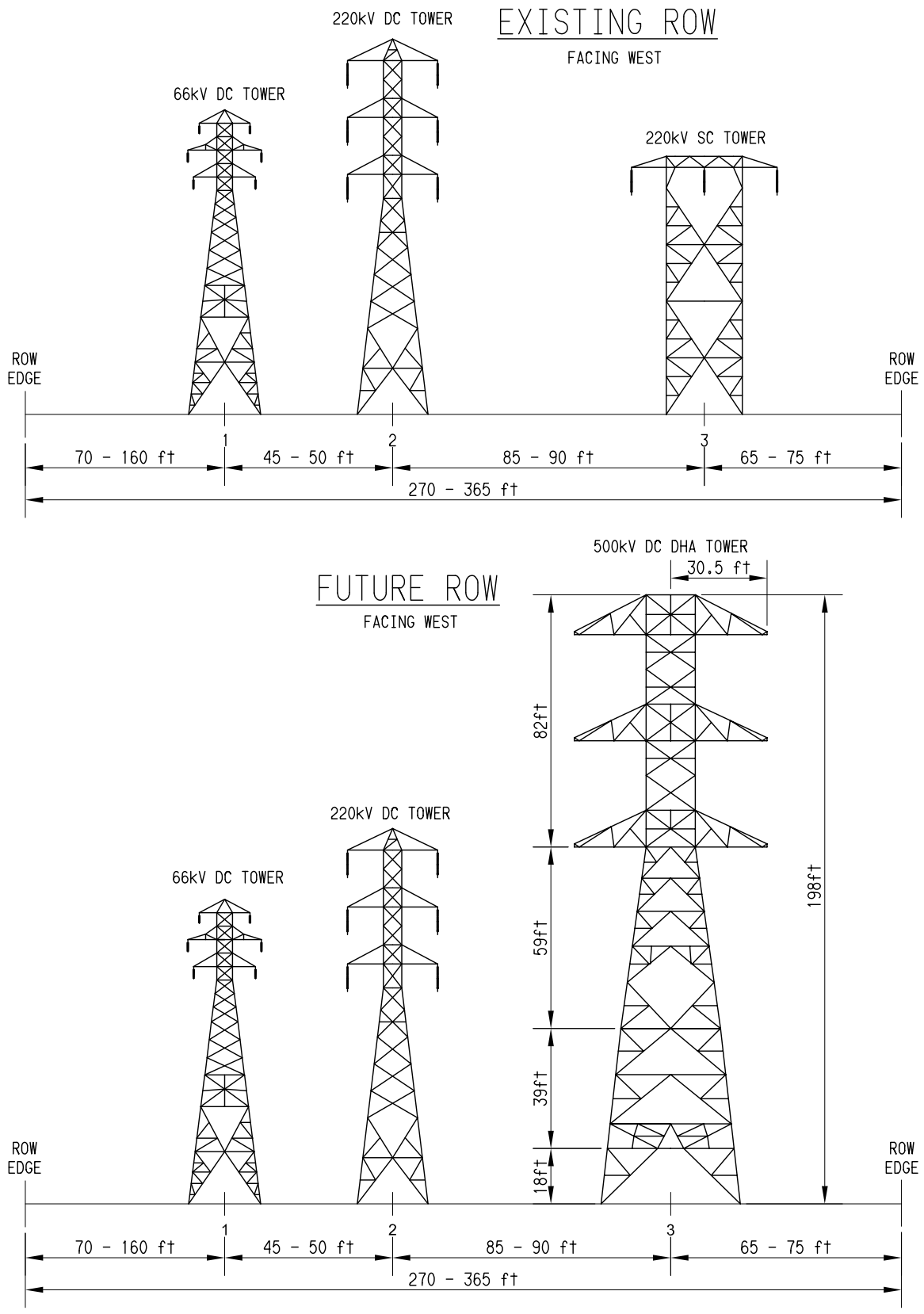
Figure 2.2-23b
Segment 7 ROW Cross-Section (S7 MP 8.3 to S7 MP 10.1)



Source: SCE, 2008p.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

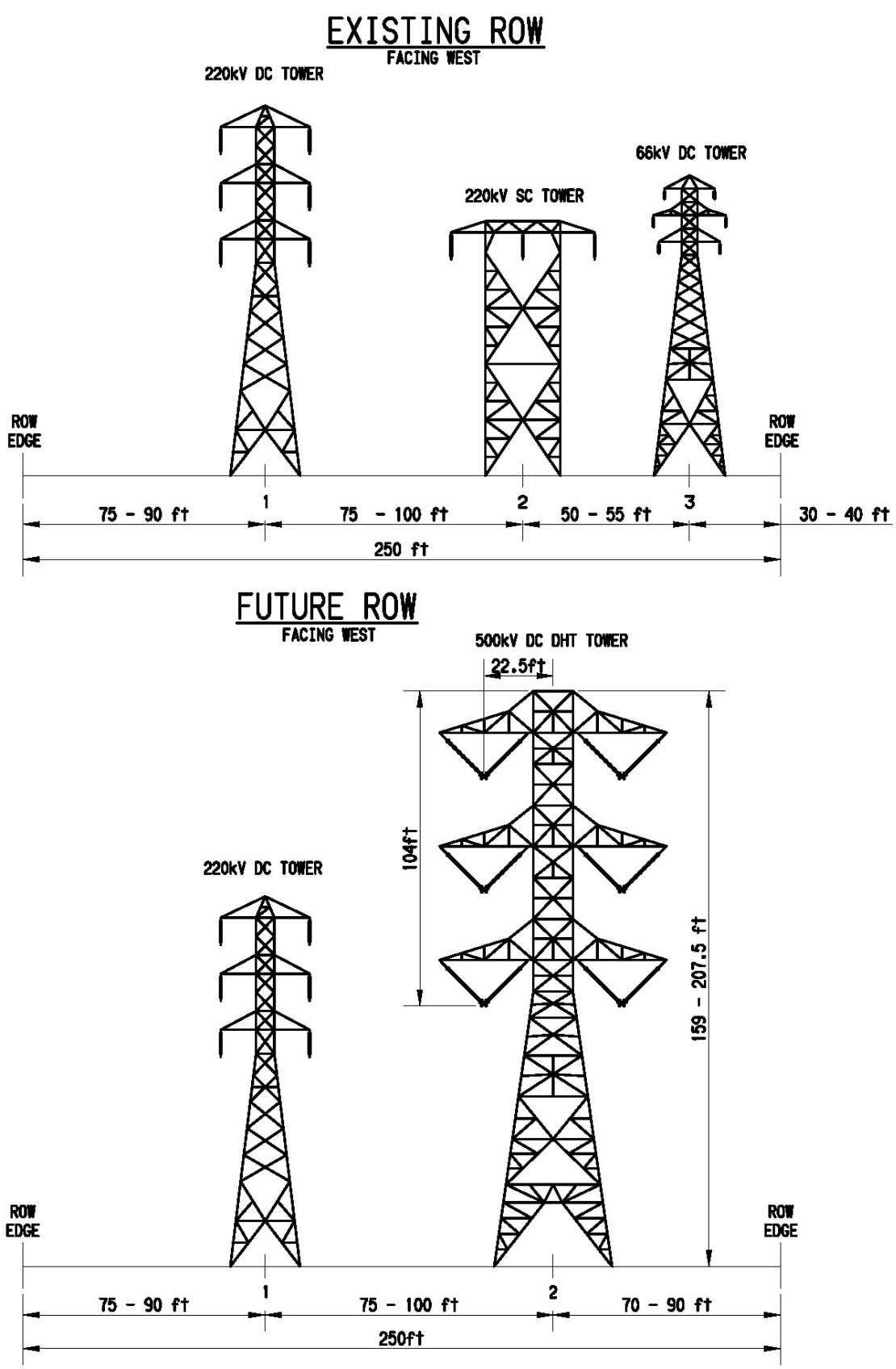
Figure 2.2-24
Segment 7 ROW Cross-Section (S7 MP 10.1 to S7 MP 10.5)



Source: SCE, 2007c.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

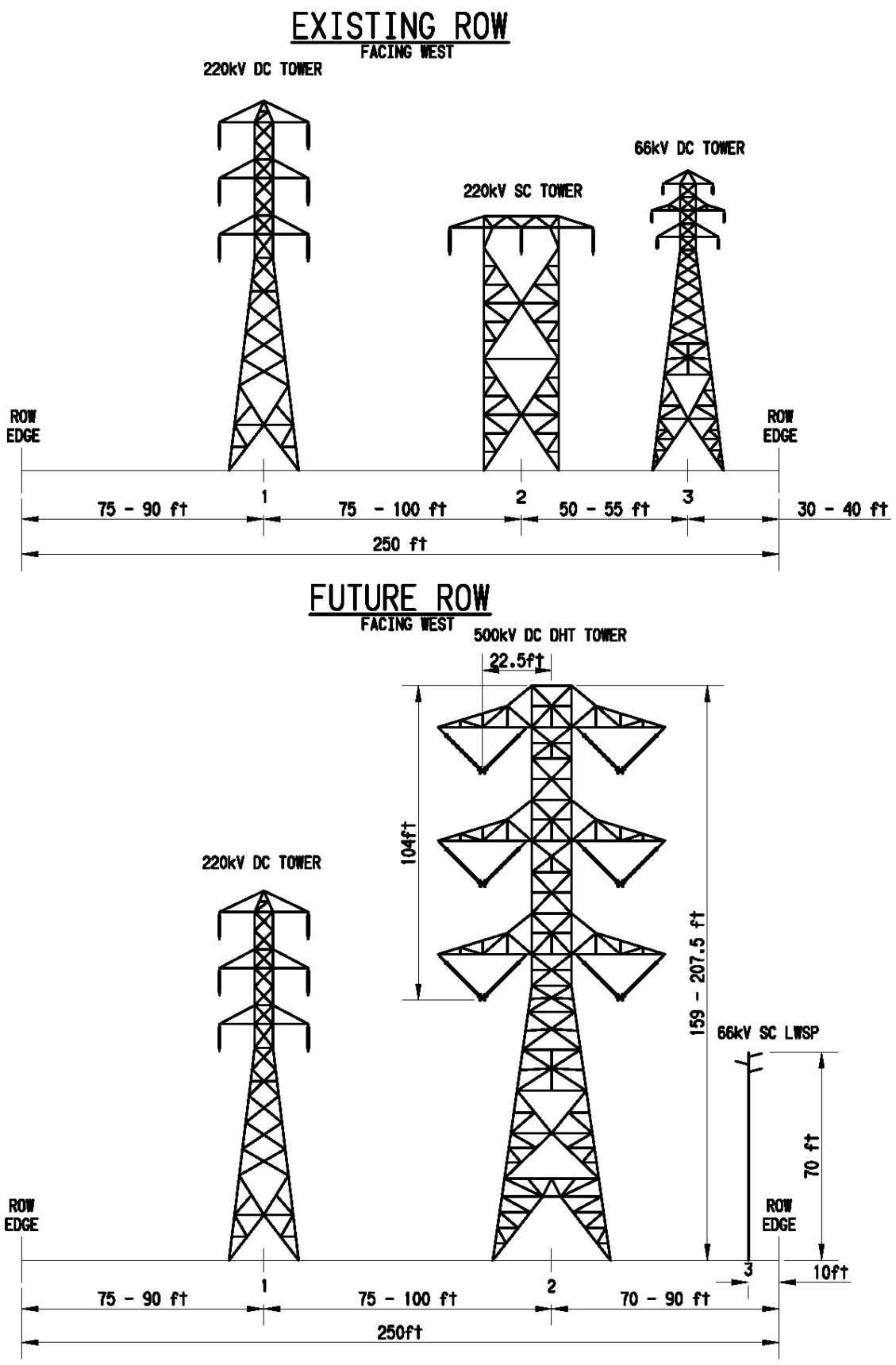
Figure 2.2-25
Segment 7 ROW Cross-Section (S7 MP 10.5 to S7 MP 10.95)



Source: SCE, 2008p.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

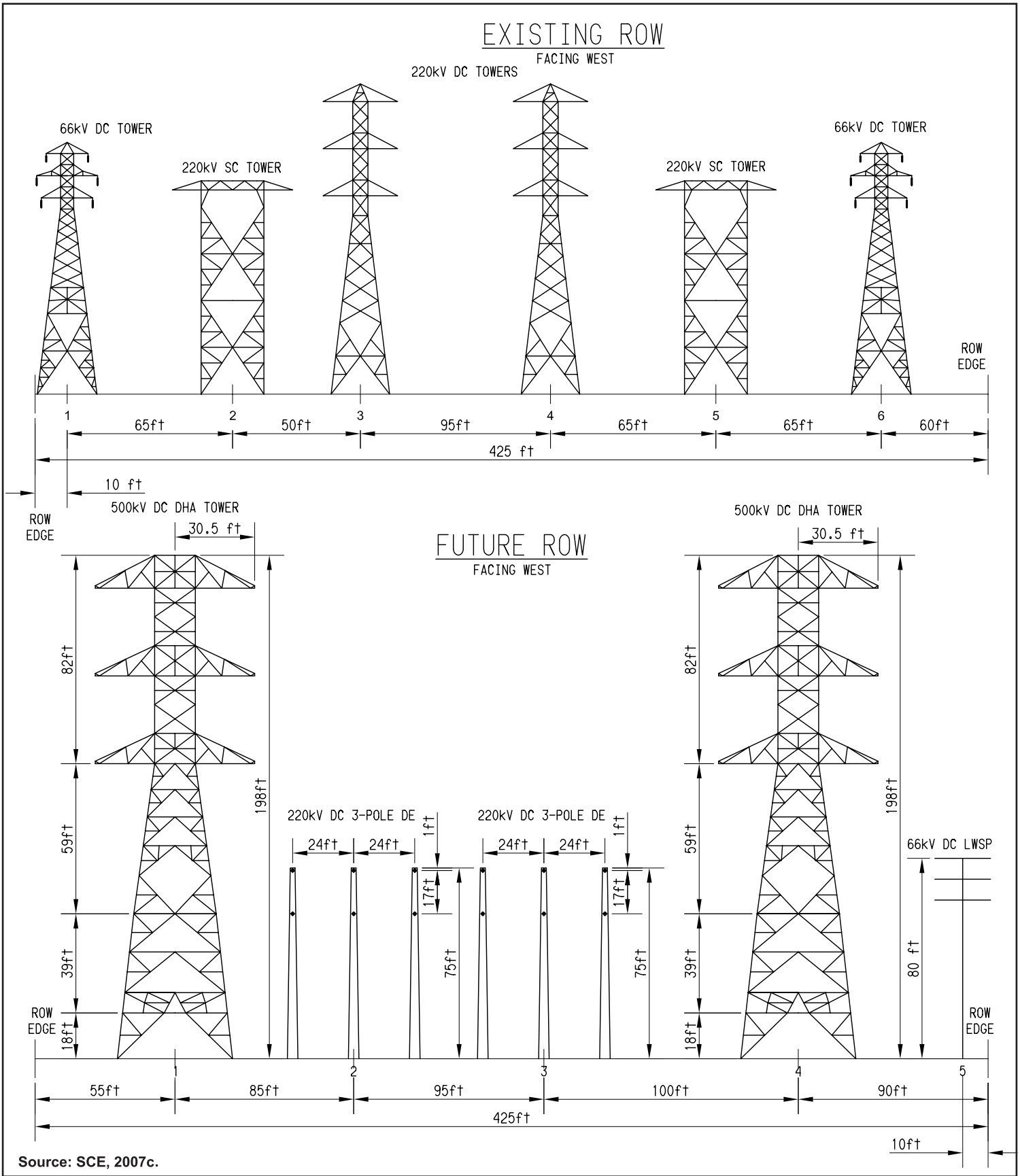
Figure 2.2-26a
Segment 7 ROW Cross-Section (S7 MP 10.95 to S7 MP 11.8)



Source: SCE, 2008p.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

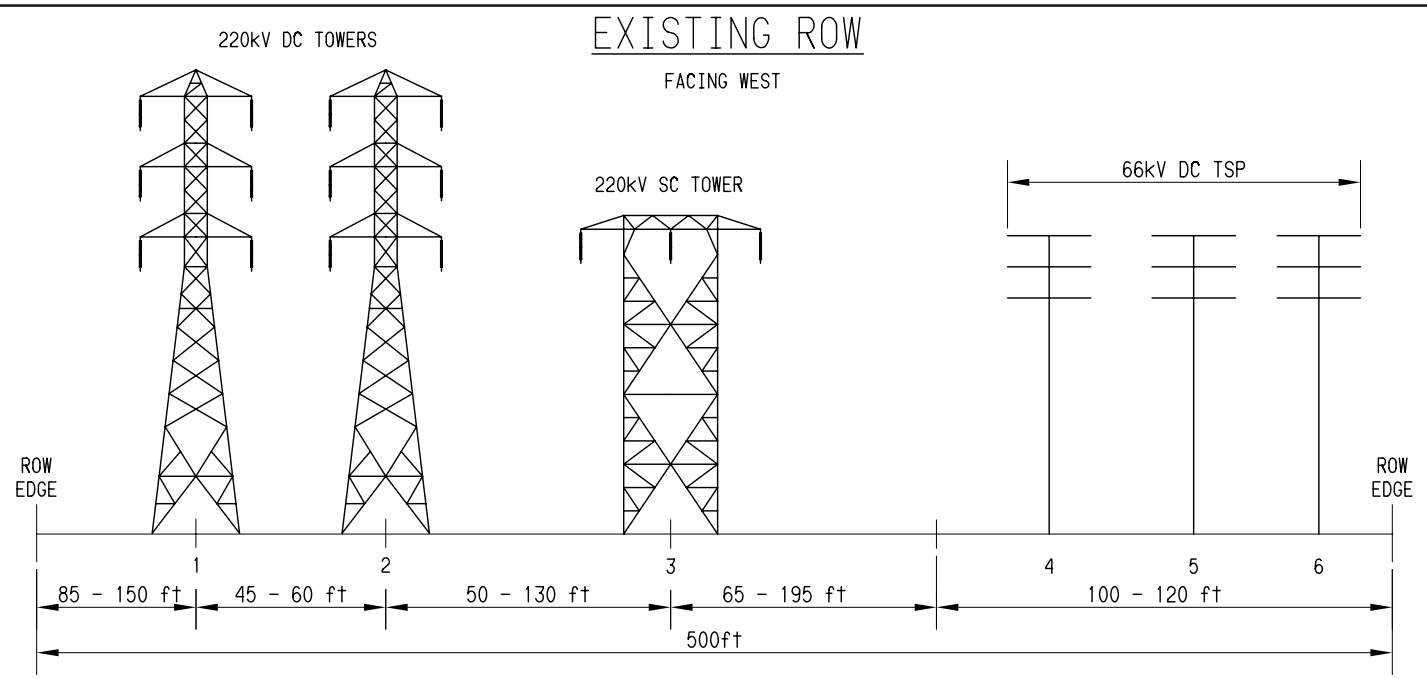
Figure 2.2-26b
Segment 7 ROW Cross-Section (S7 MP 11.8 to S7 MP 13.4)

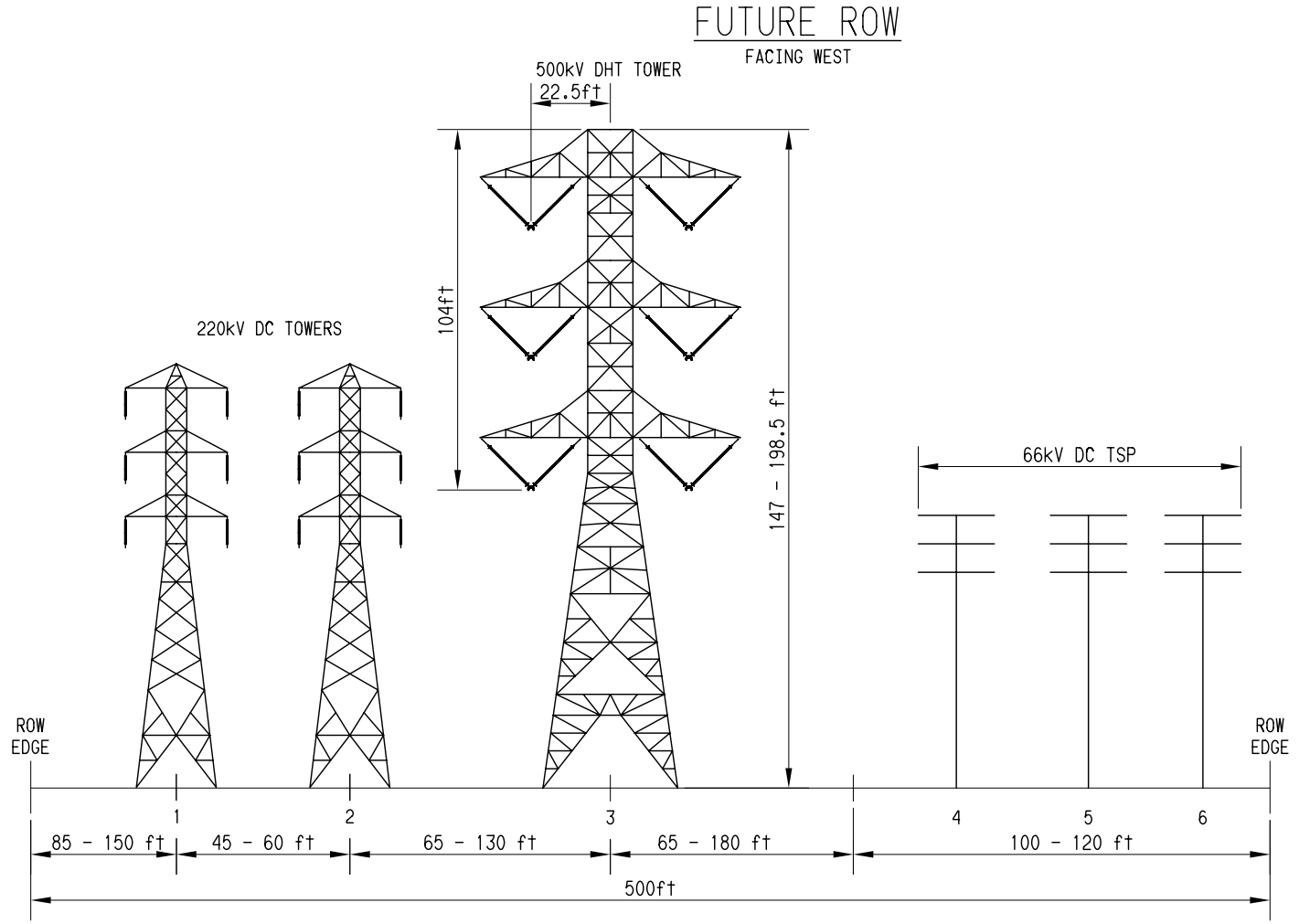


Source: SCE, 2007c.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Figure 2.2-27
Segment 7 ROW Cross-Section (S7 MP 13.4 to S7 MP 13.7)

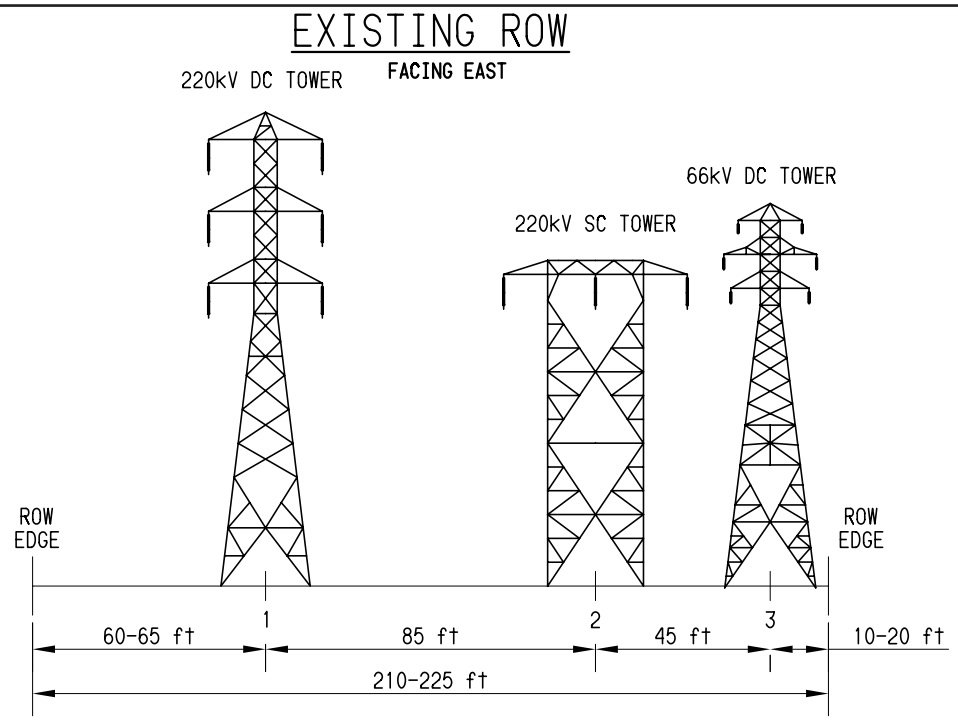


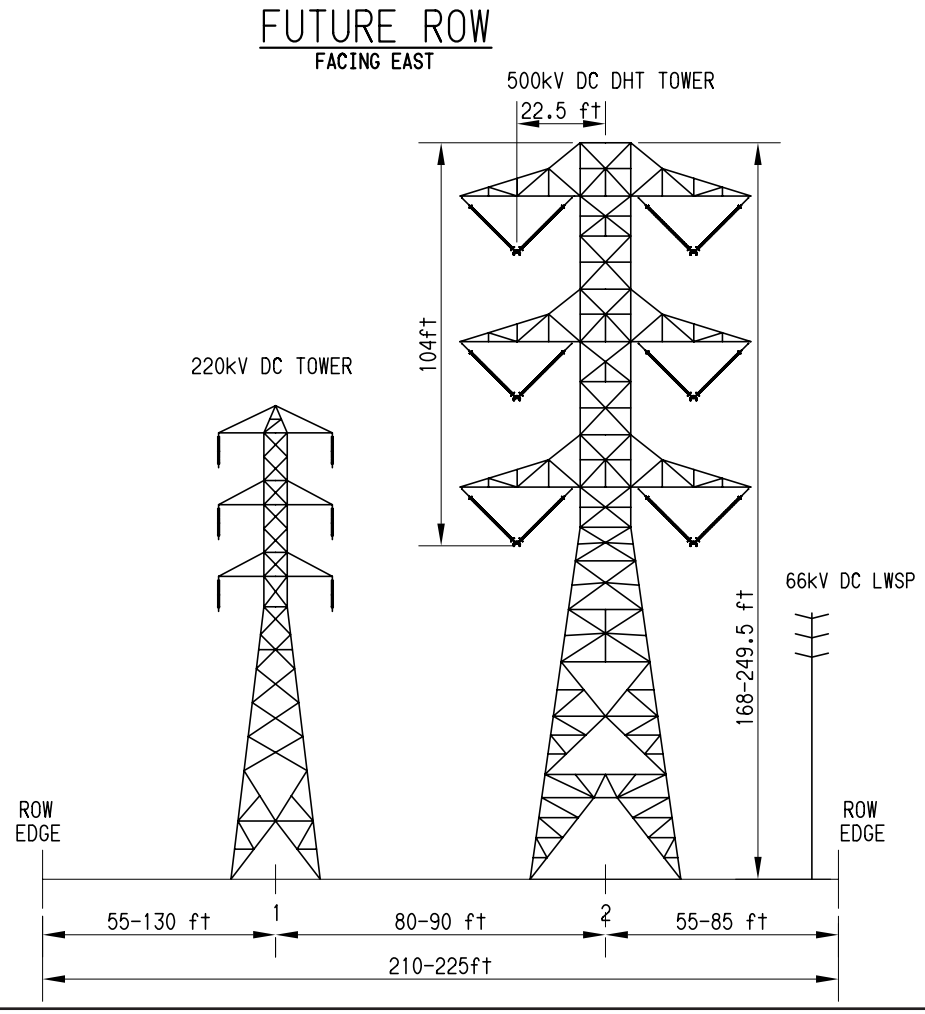


Source: SCE, 2007c.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Figure 2.2-28
Segment 7 ROW Cross-Section (S7 MP 13.7 to S7 MP 15.8)

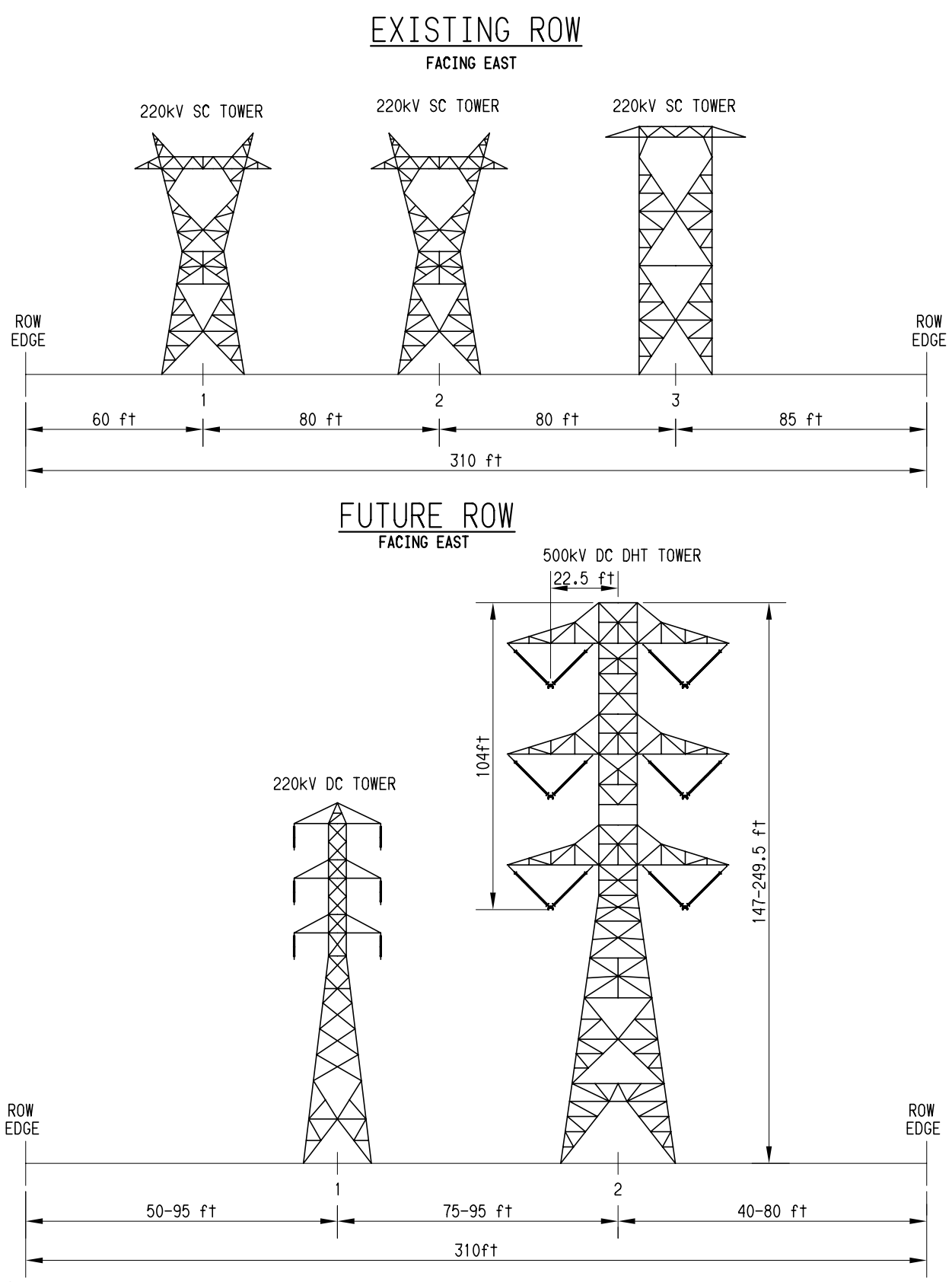




Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

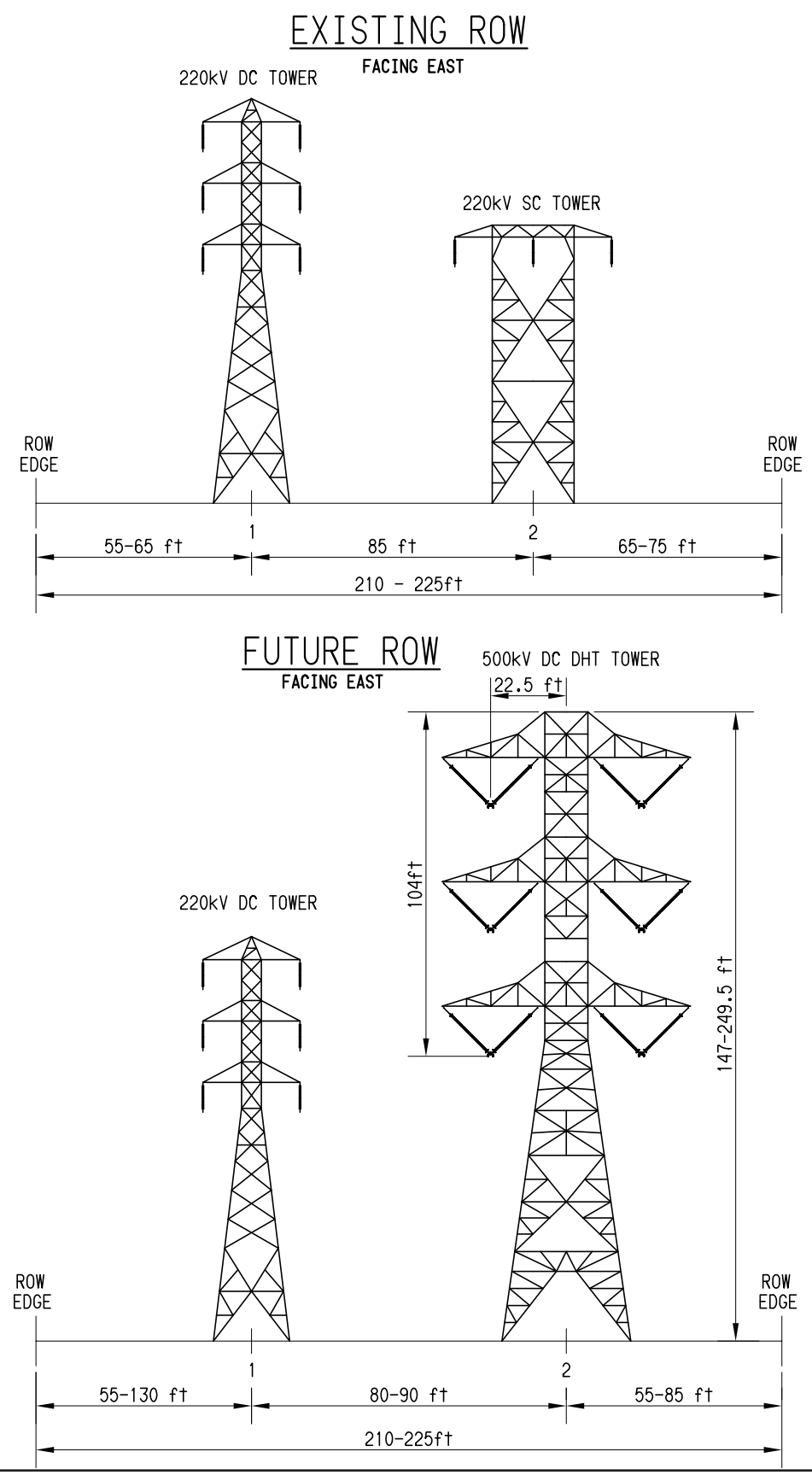
Figure 2.2-29
Segment 8 ROW Cross-Section (S8A MP 2.2 to S8A MP 4.2)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

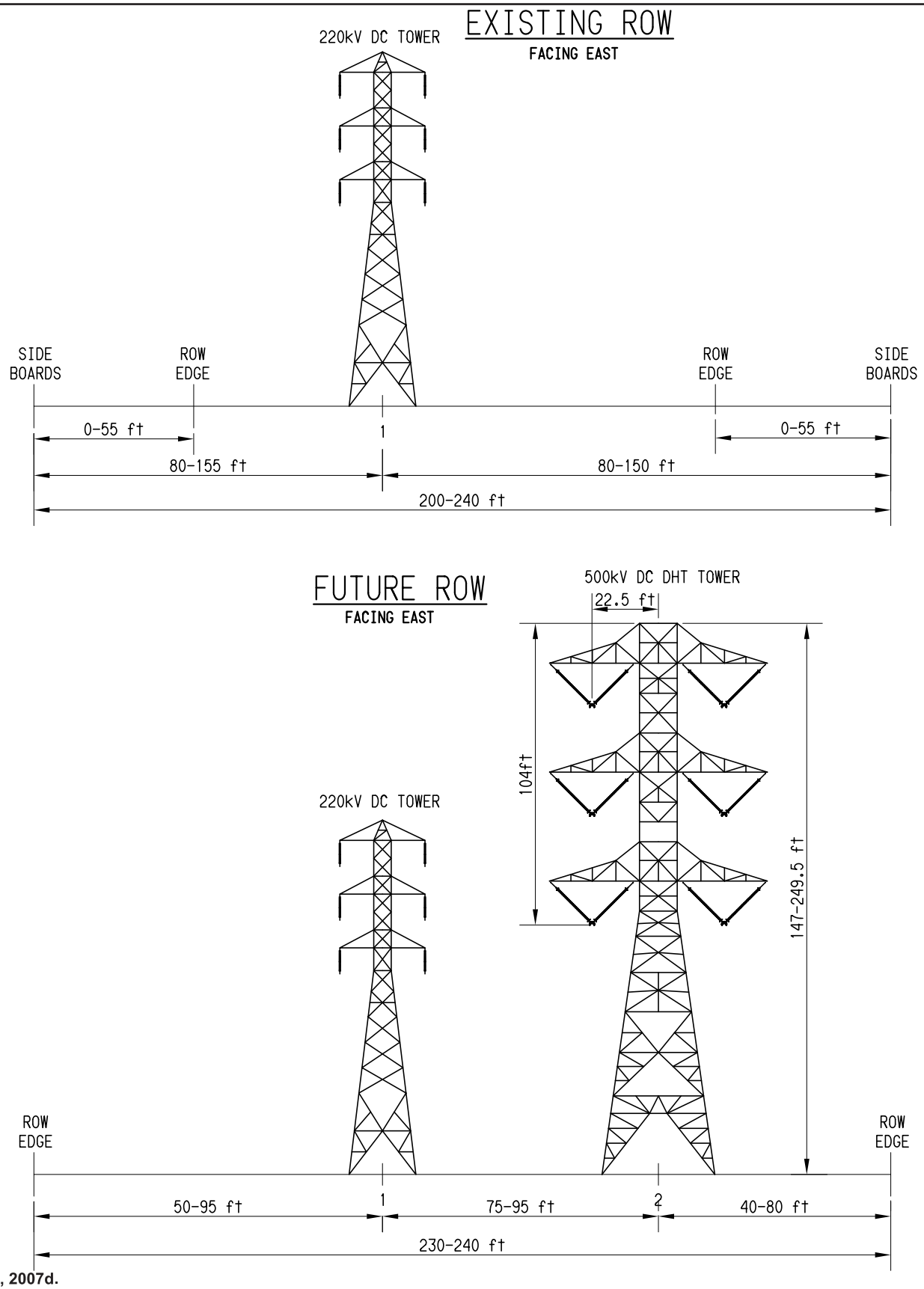
Figure 2.2-30
Segment 8 ROW Cross-Section (S8A MP 4.2 to S8A MP 4.4)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

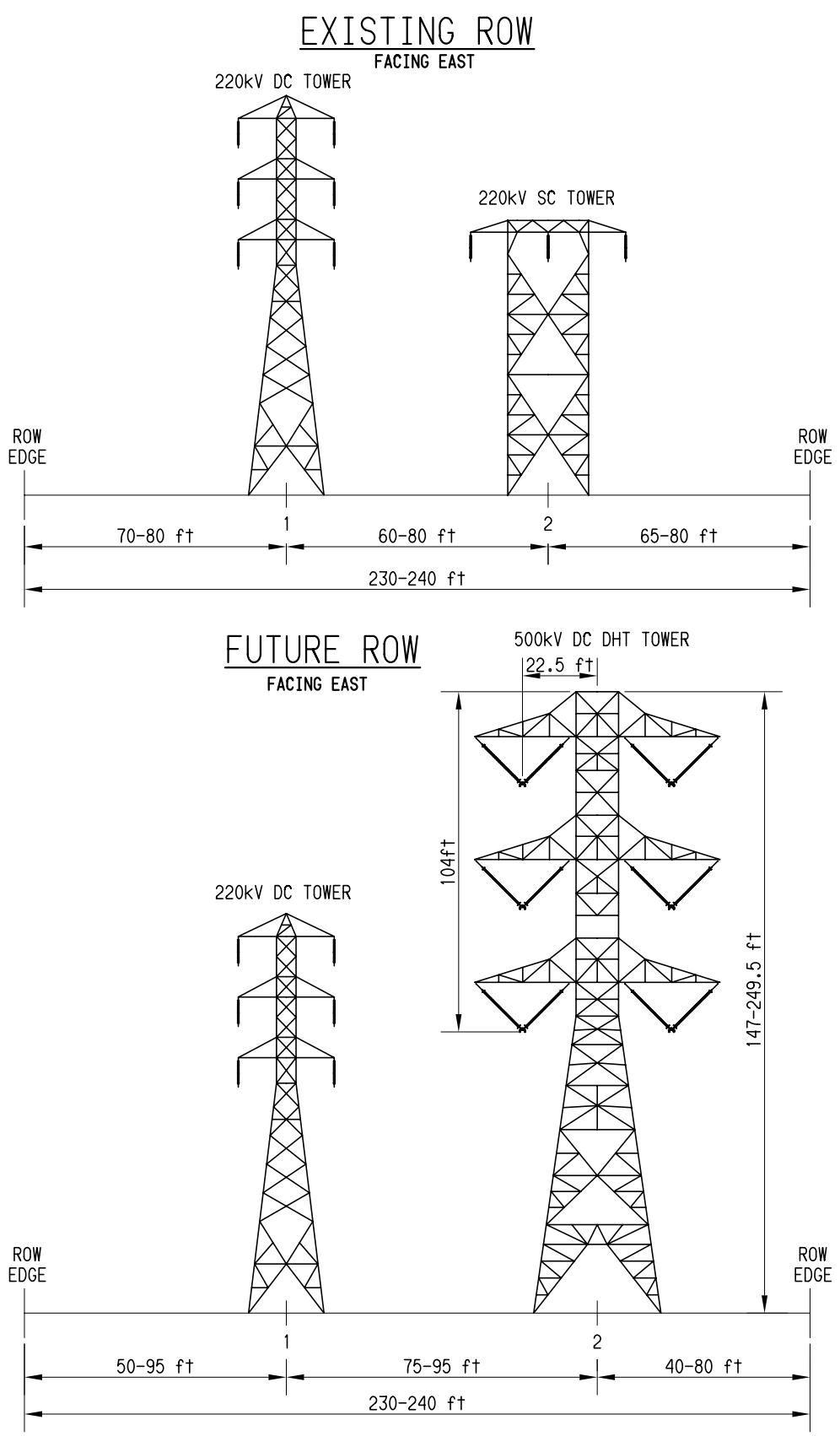
Figure 2.2-31
Segment 8 ROW Cross-Section (S8A MP 4.4 to S8A MP 5.85)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

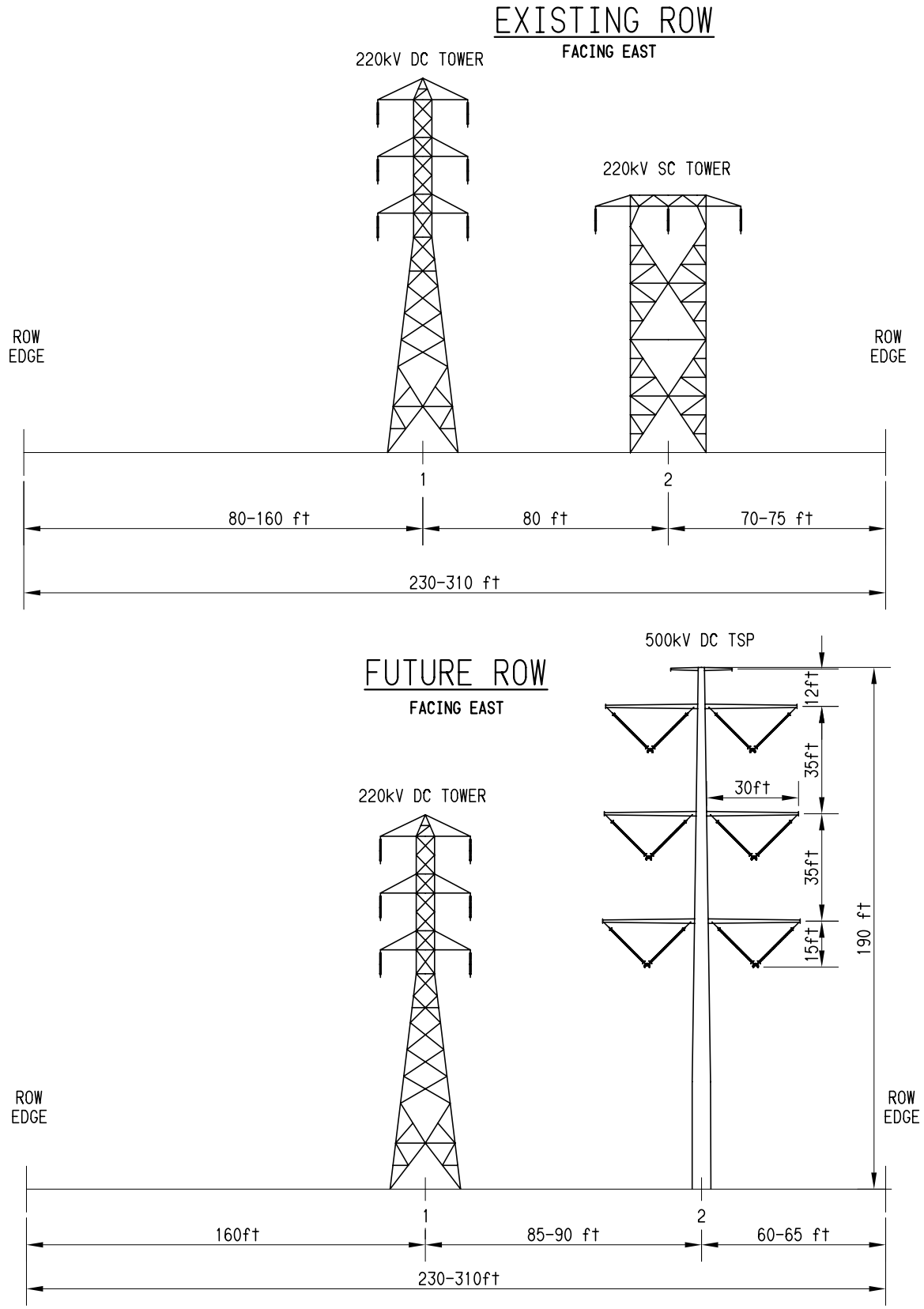
Figure 2.2-32
Segment 8 ROW Cross-Section (S8A MP 5.85 to S8A MP 8.1)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

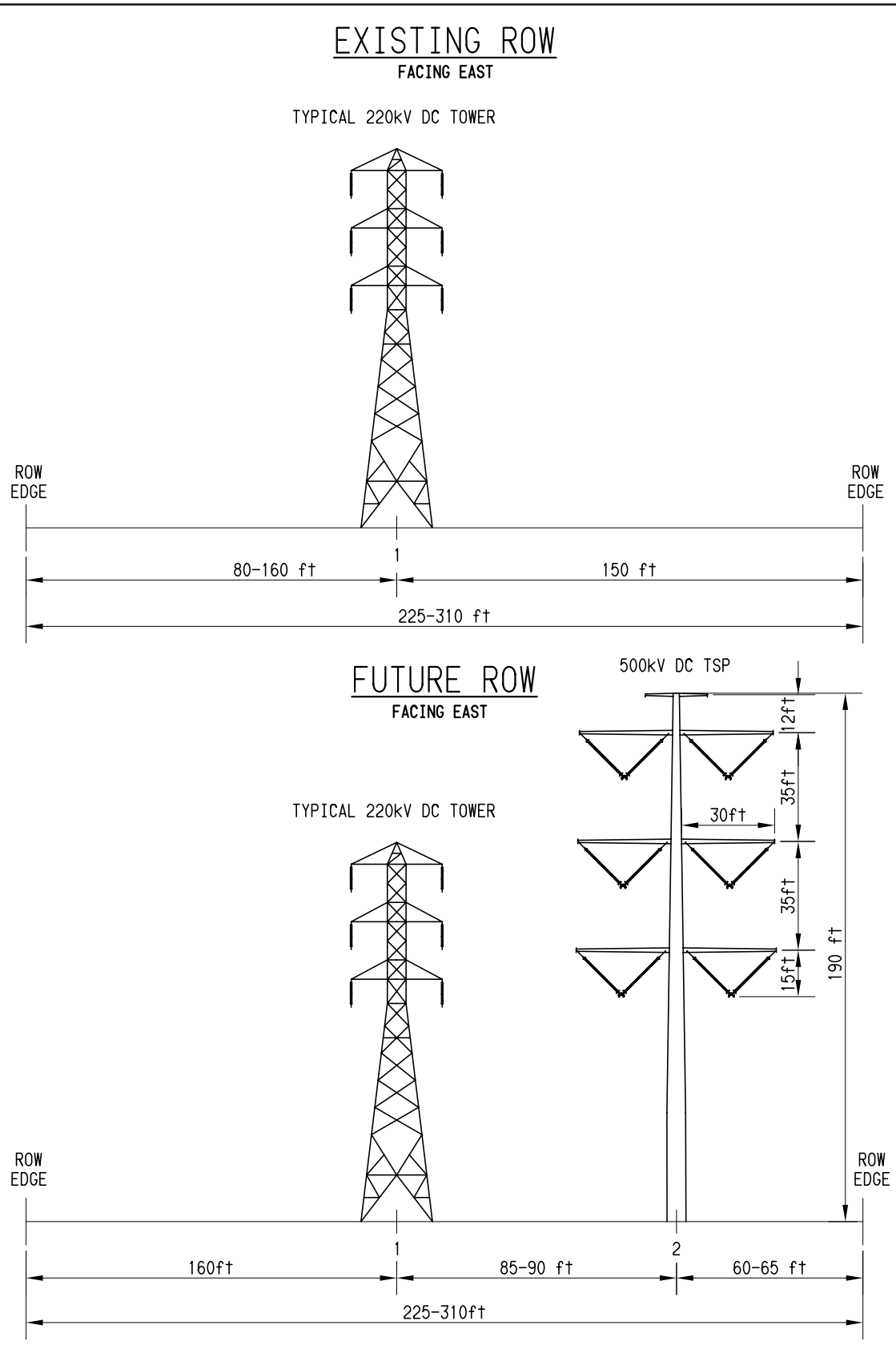
Figure 2.2-33
Segment 8 ROW Cross-Section (S8A MP 8.1 to S8A MP 9.0)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

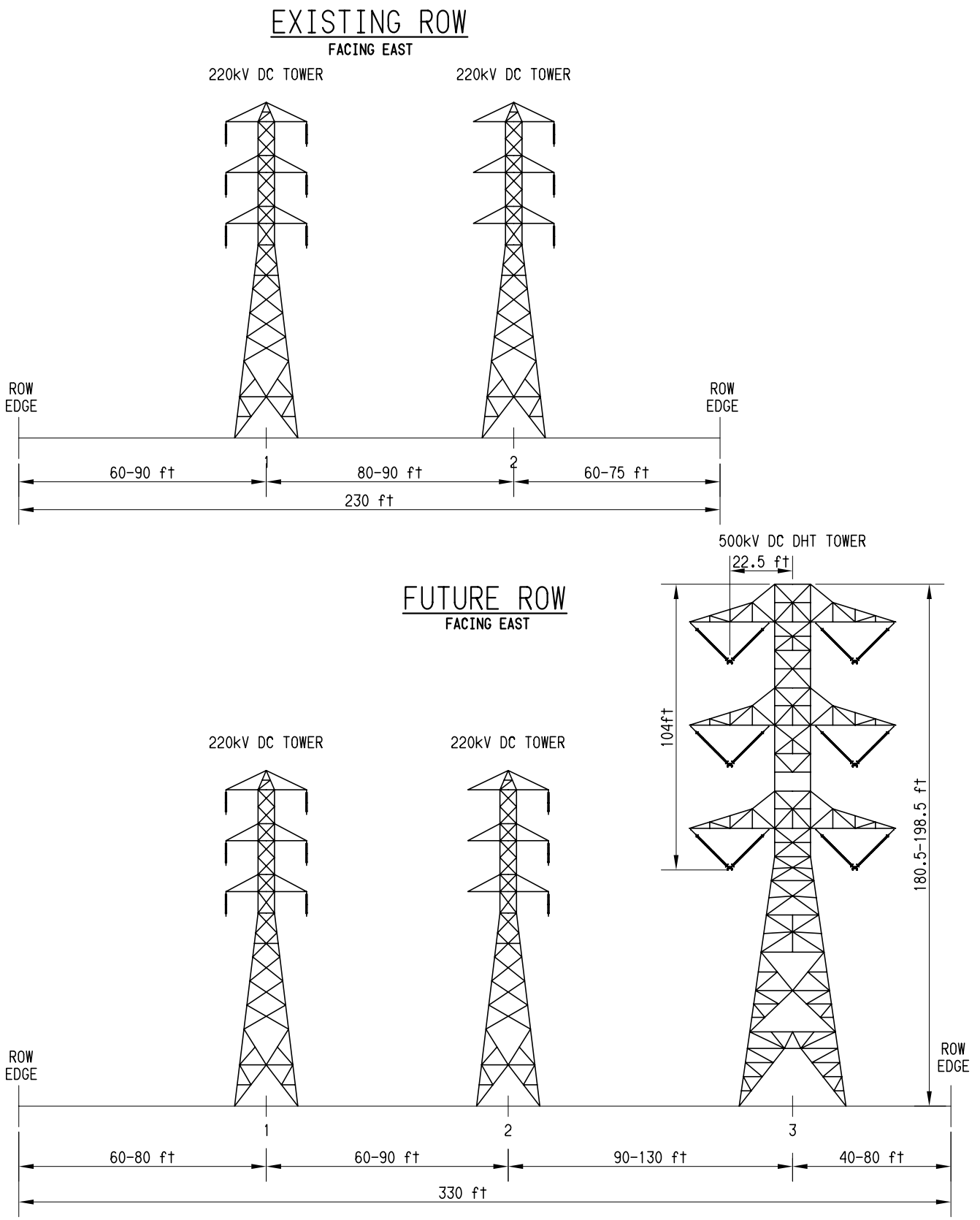
Figure 2.2-34
Segment 8 ROW Cross-Section (S8A MP 9.0 to S8A MP 9.5)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

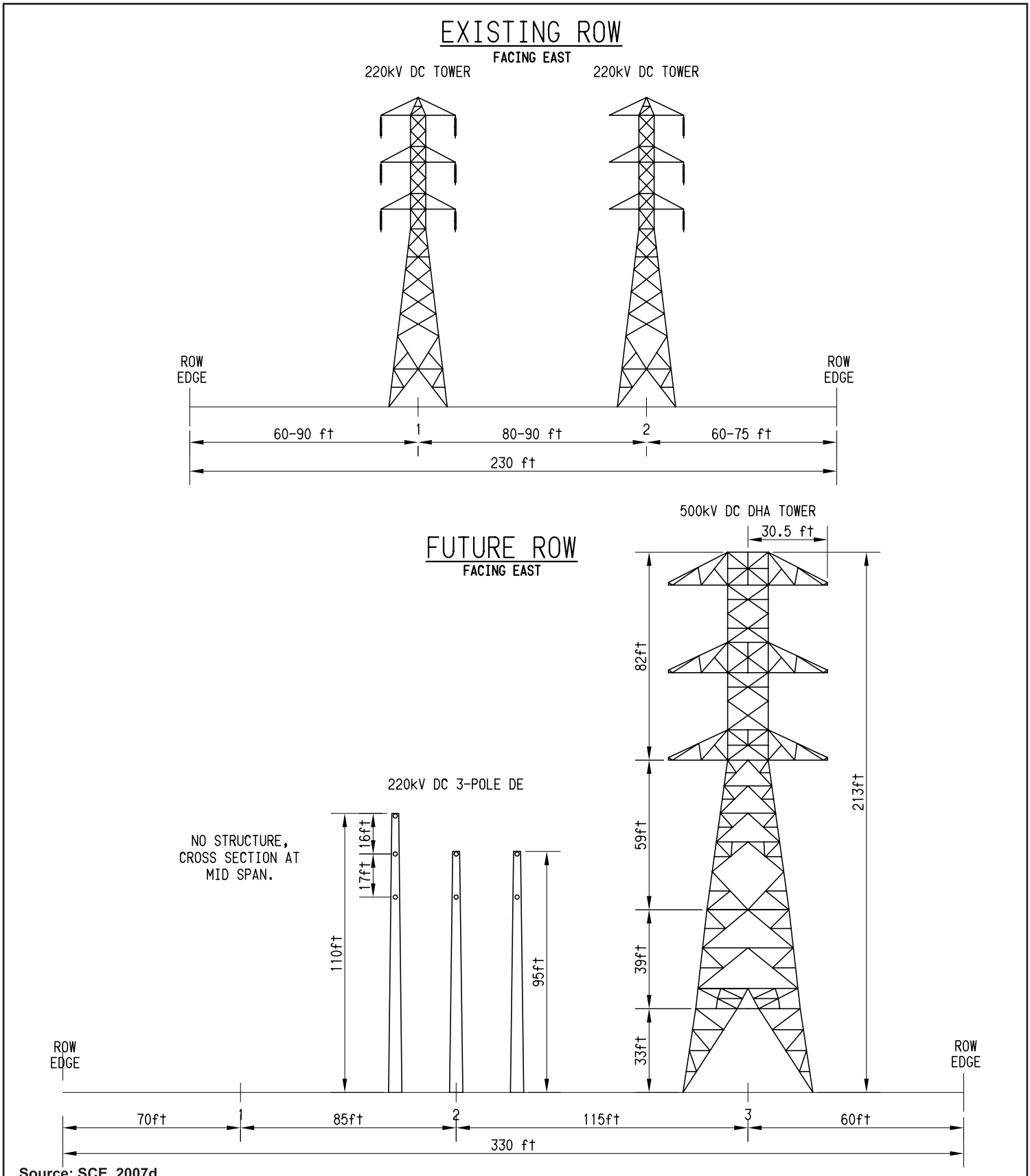
Figure 2.2-35
Segment 8 ROW Cross-Section (S8A MP 9.5 to S8A MP 11.2)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

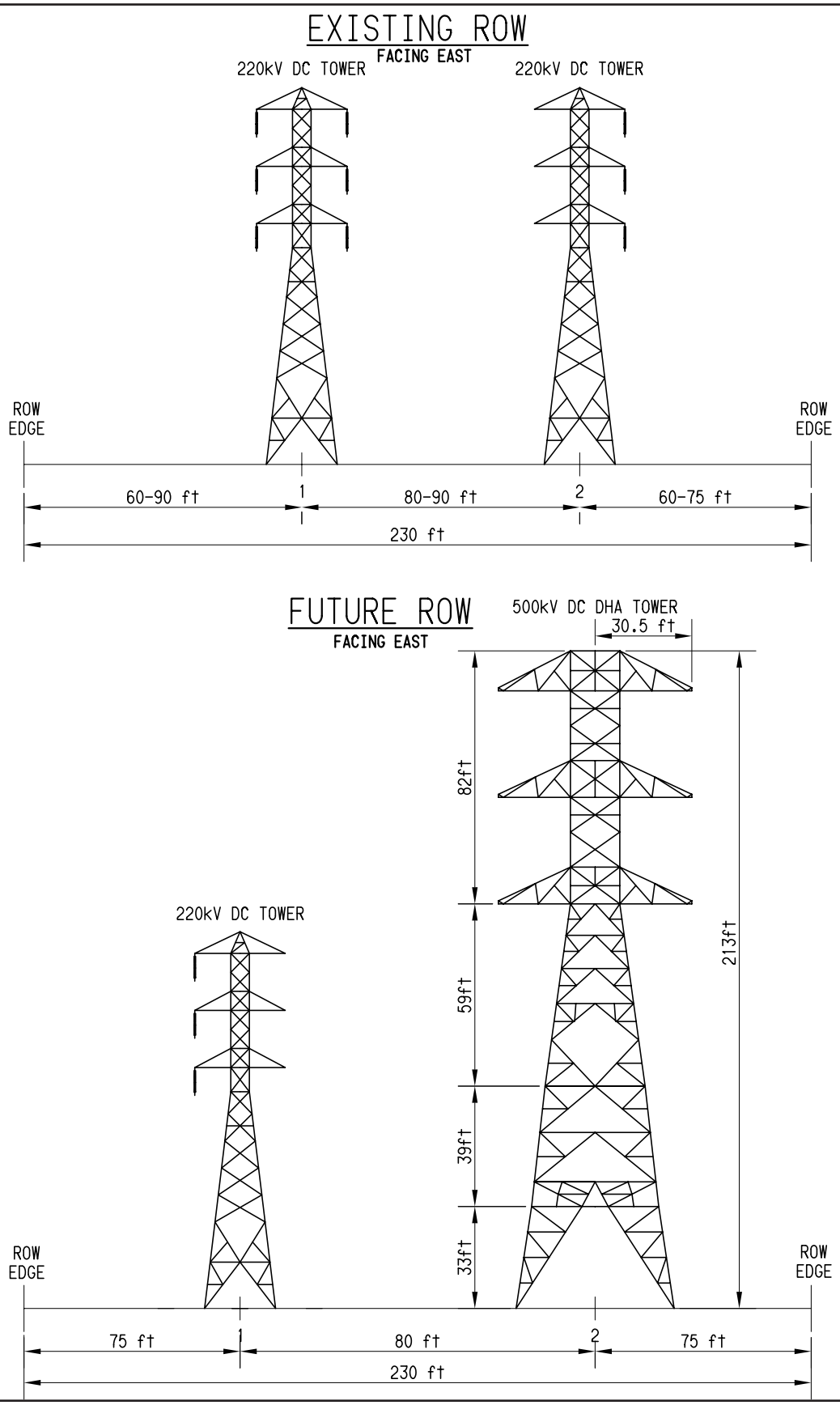
Figure 2.2-36
Segment 8 ROW Cross-Section (S8A MP 11.2 to S8A MP 13.3)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

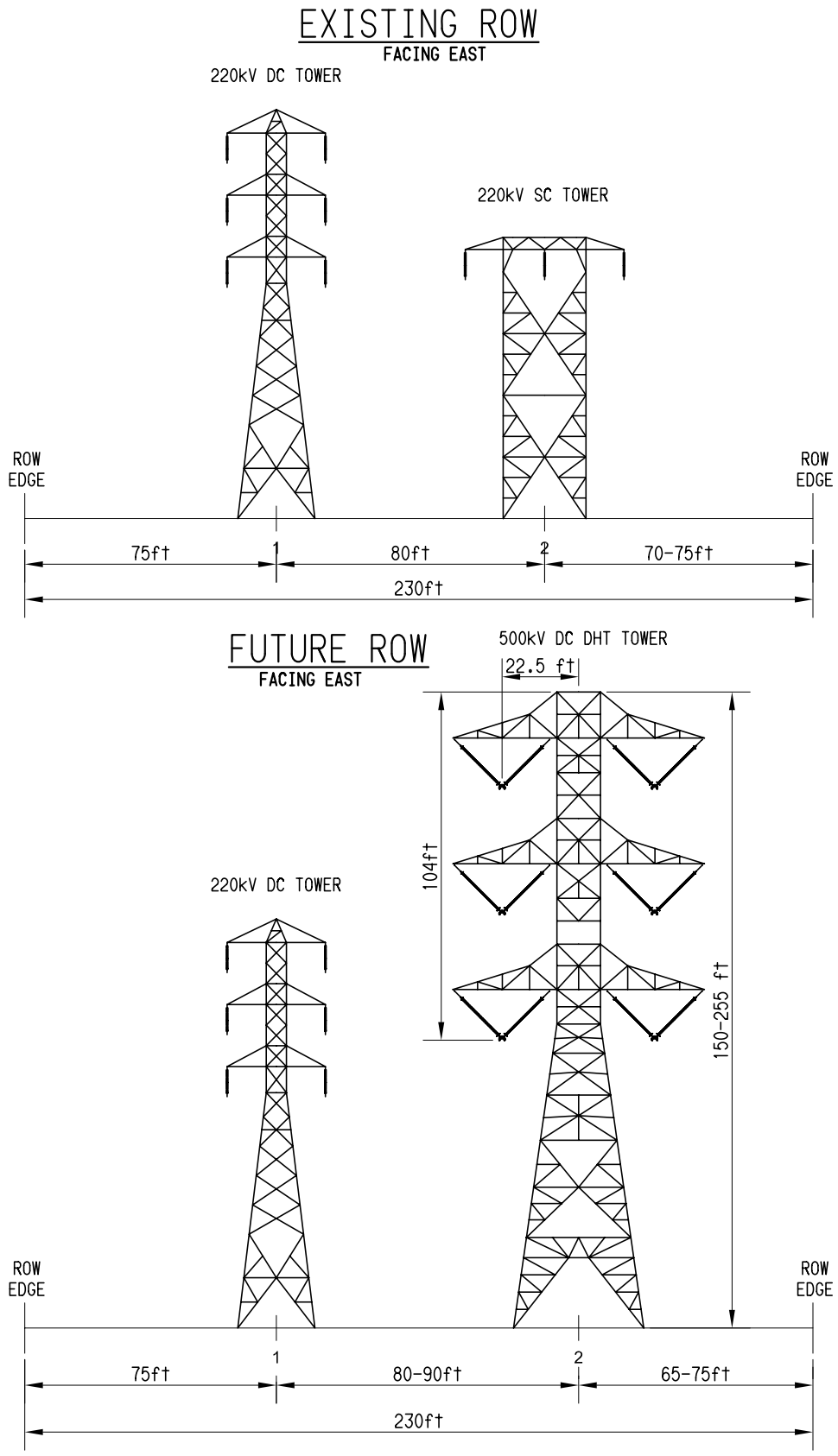
Figure 2.2-37
Segment 8 ROW Cross-Section (S8A MP 13.3 to S8A MP 13.4)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

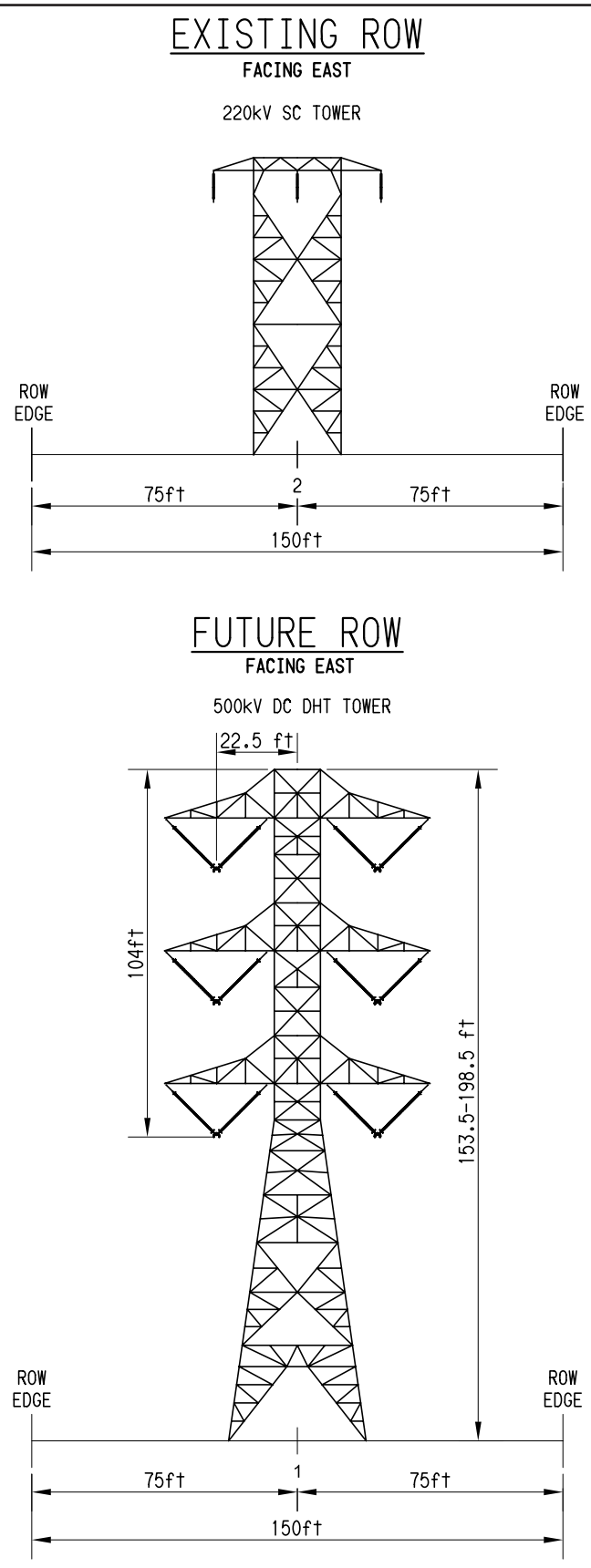
Figure 2.2-38
Segment 8 ROW Cross-Section (S8A MP 13.4 to S8A MP 13.55)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

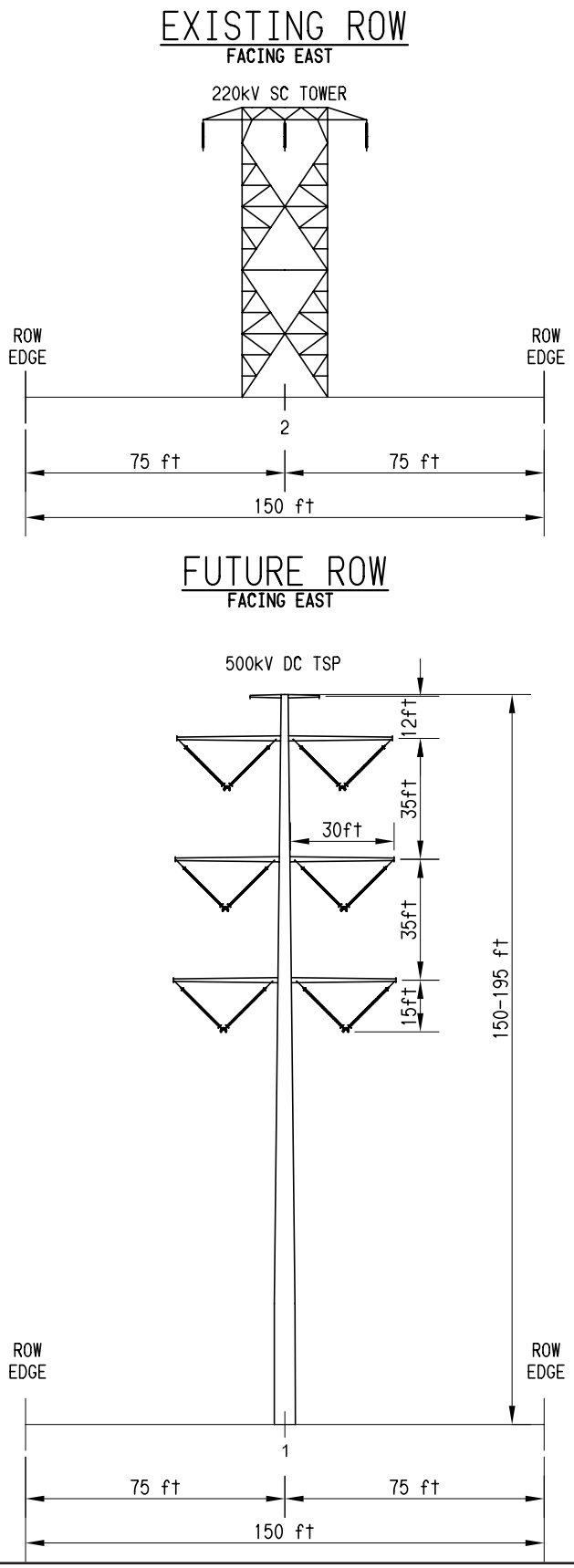
Figure 2.2-39
Segment 8 ROW Cross-Section (S8A MP 13.55 to S8A MP 19.2)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

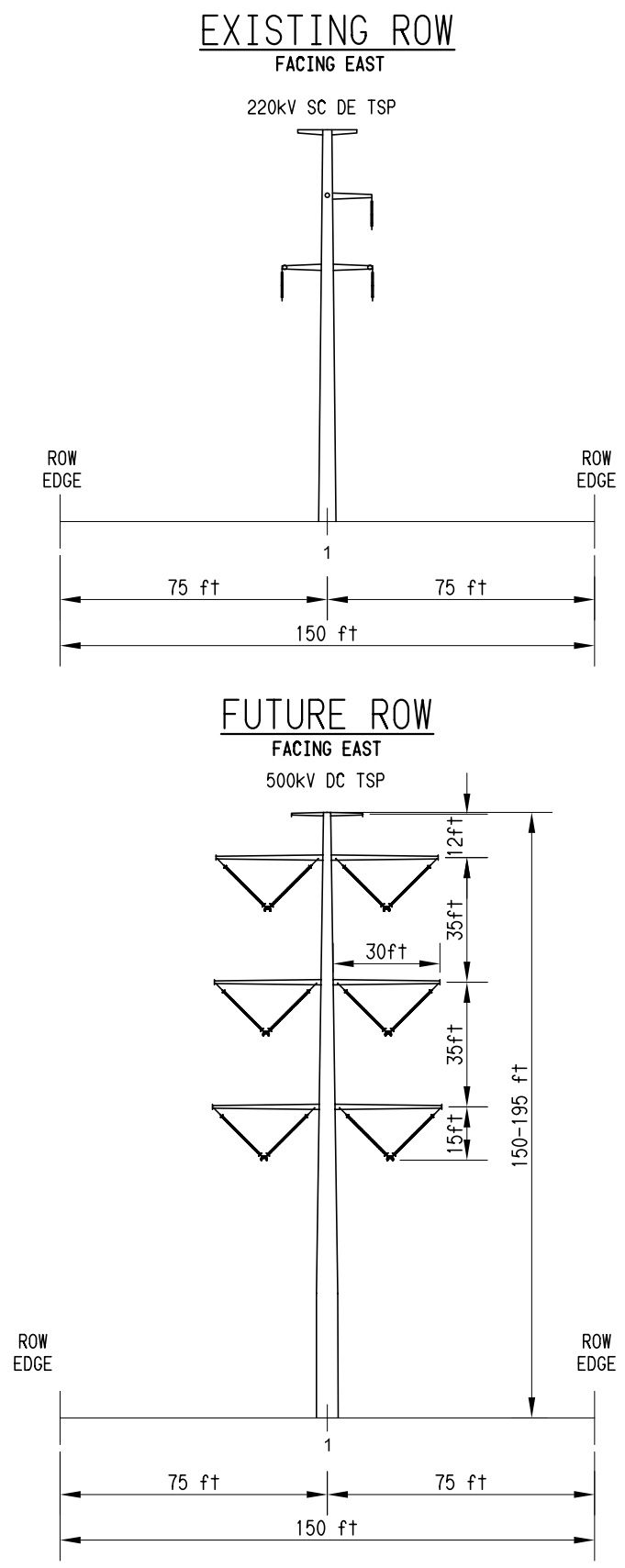
Figure 2.2-40
Segment 8 ROW Cross-Section (S8A MP 19.2 to S8A MP 22.9)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

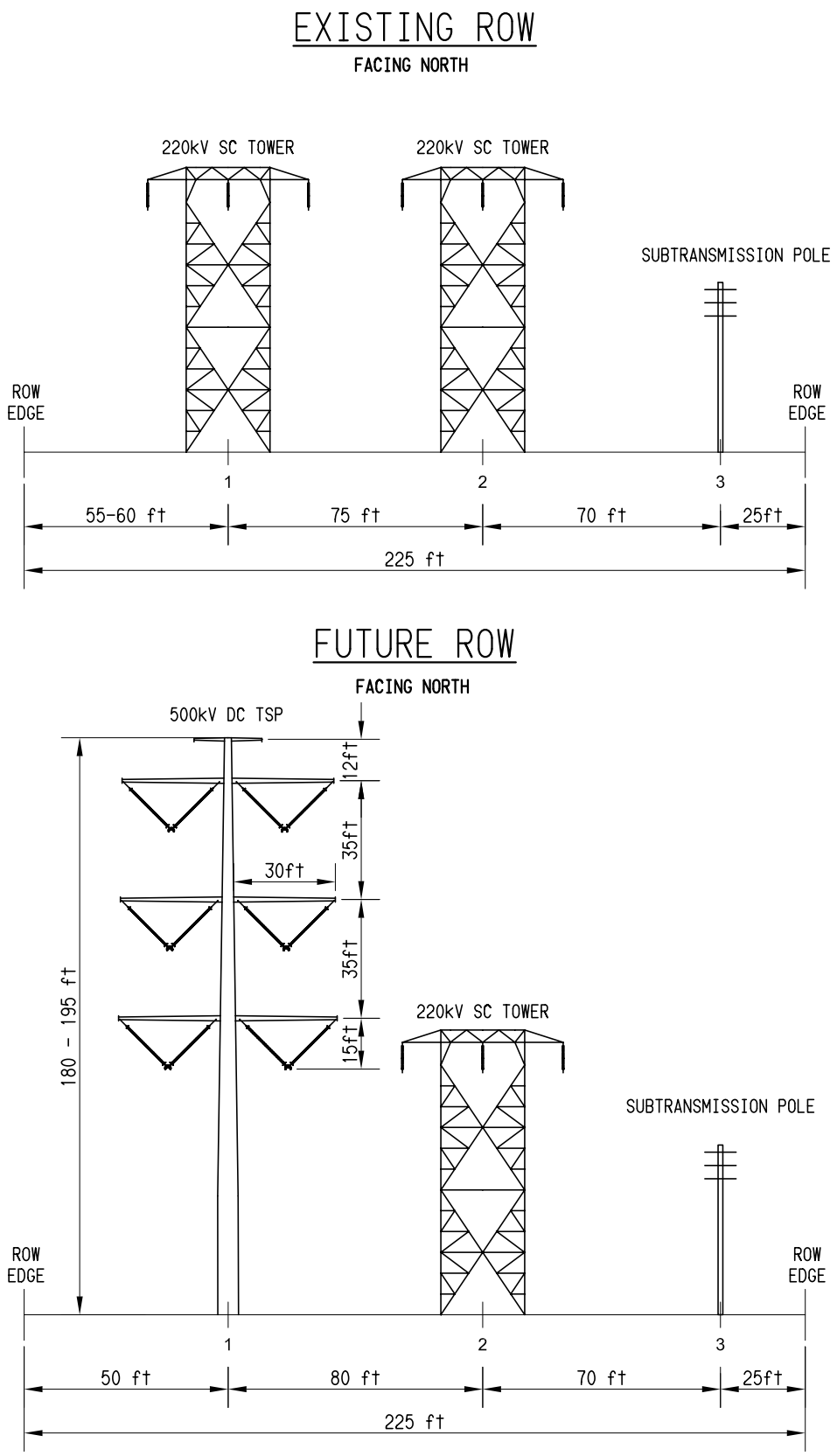
Figure 2.2-41
Segment 8 ROW Cross-Section (S8A MP 22.9 to S8A MP 26.4)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

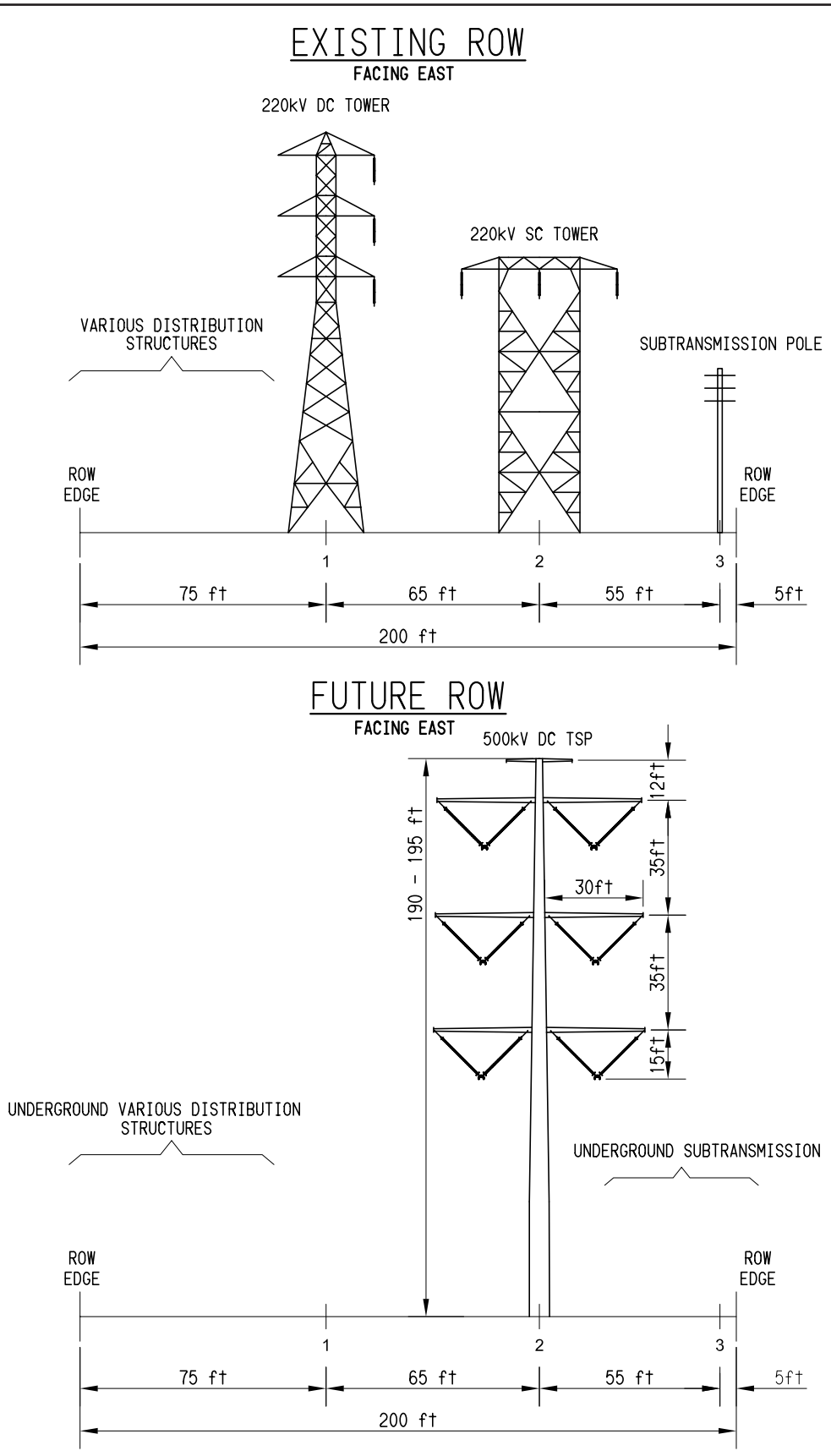
Figure 2.2-42
Segment 8 ROW Cross-Section (S8A MP 26.4 to S8A MP 26.8)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

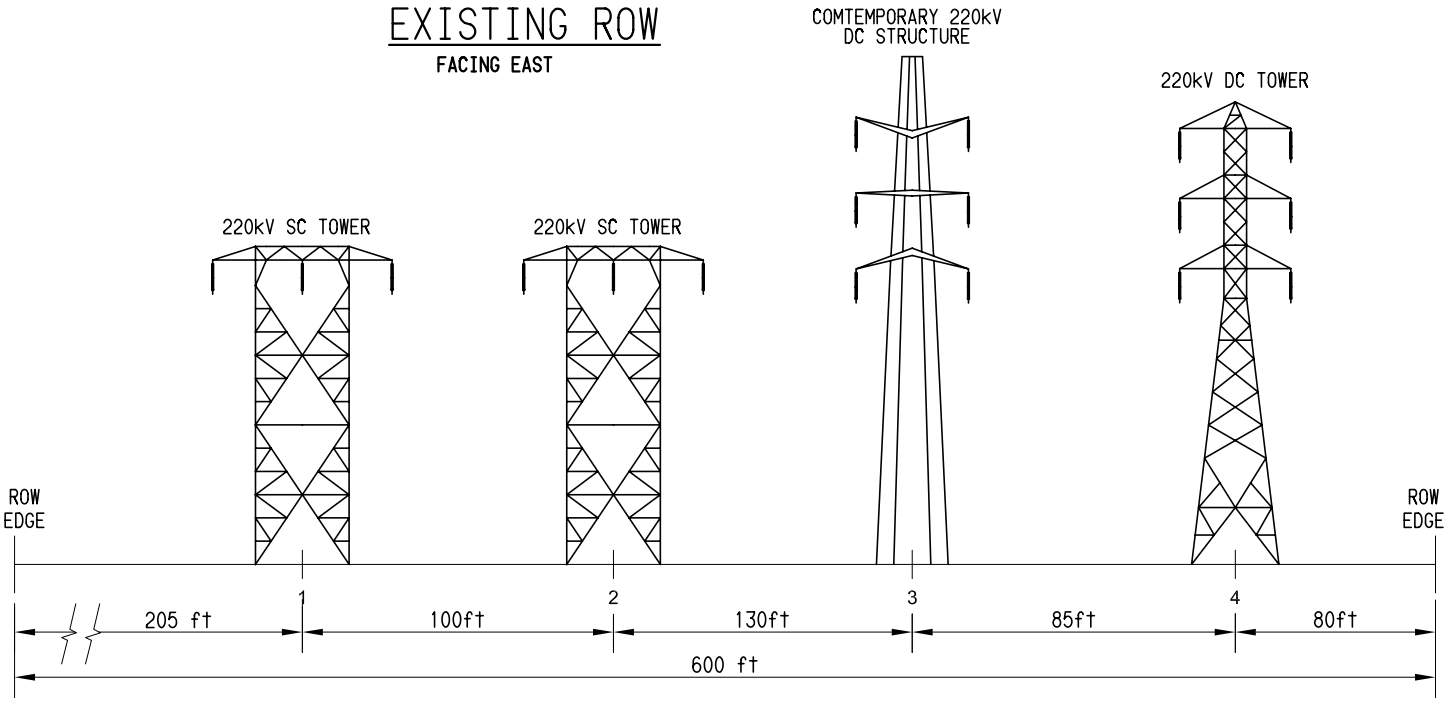
Figure 2.2-43
Segment 8 ROW Cross-Section (S8A MP 26.8 to S8A MP 27.55)

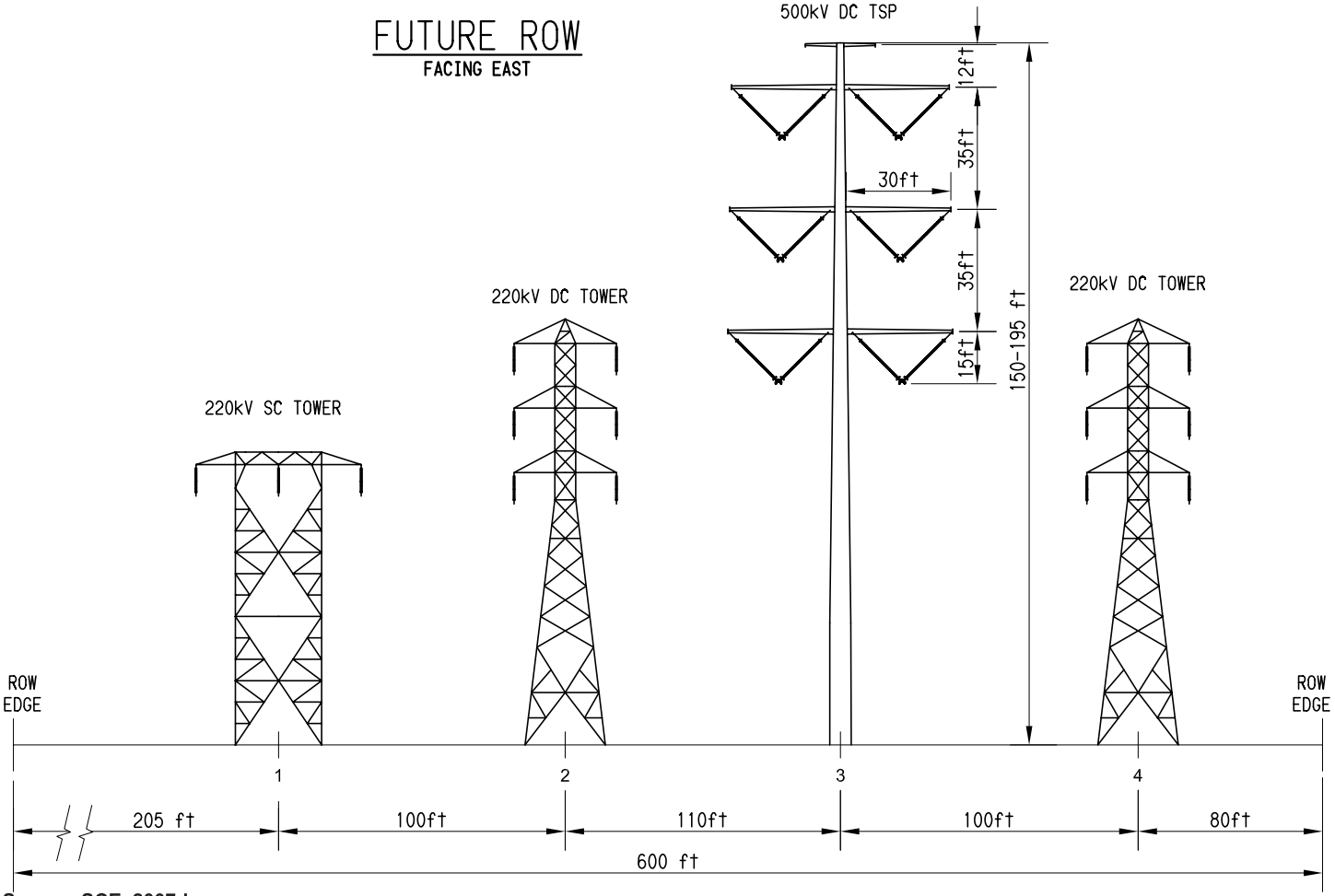


Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Figure 2.2-44
Segment 8 ROW Cross-Section (S8A MP 27.55 to S8A MP 28.3)

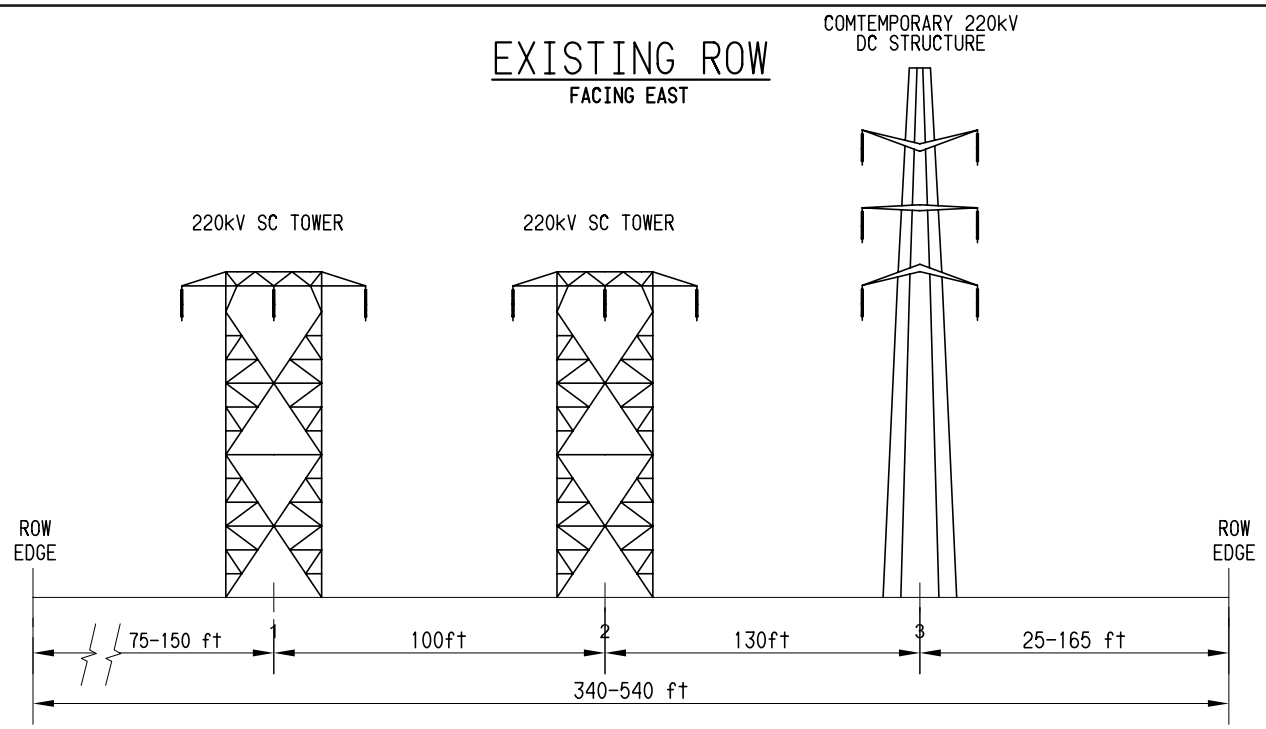


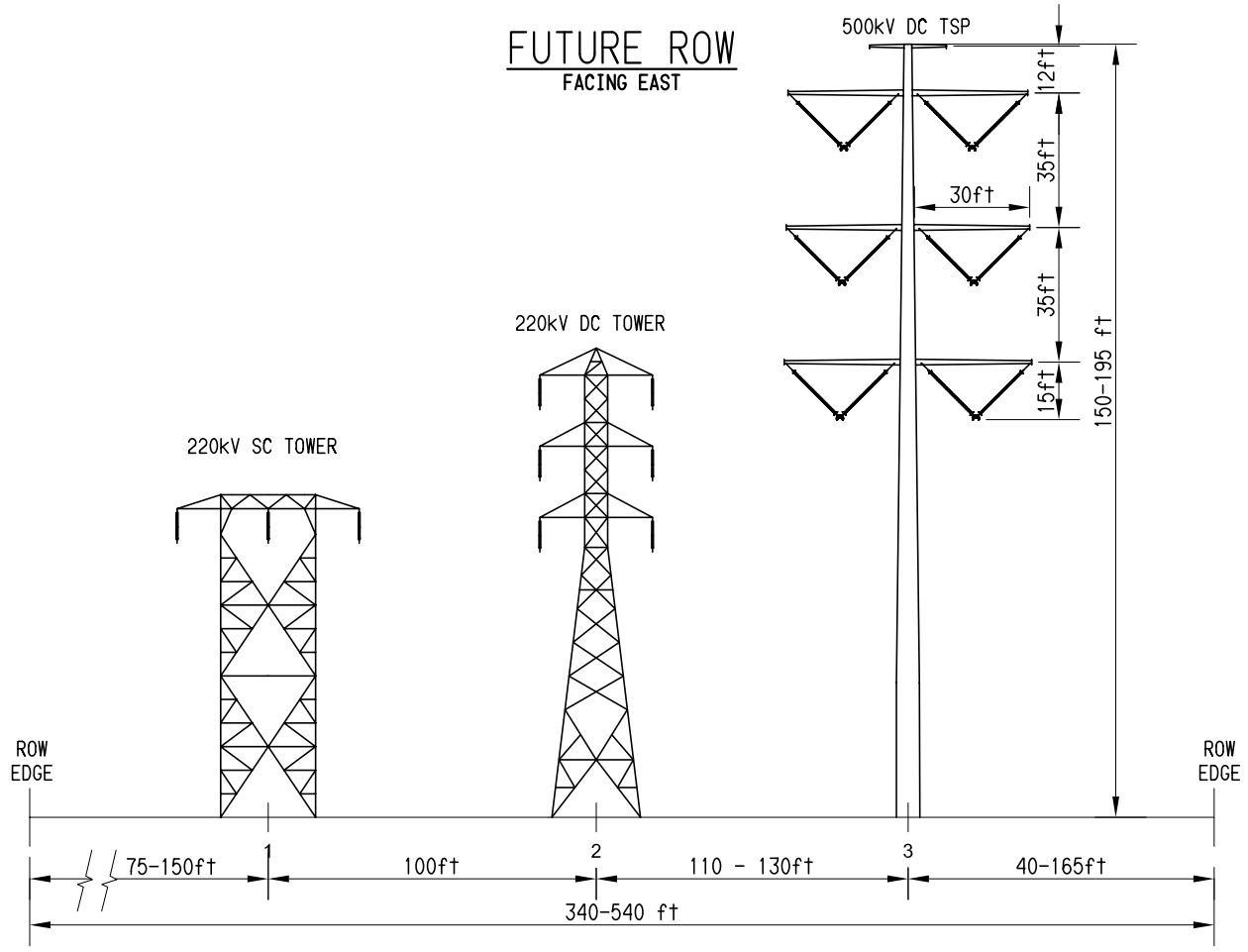


Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Figure 2.2-45
Segment 8 ROW Cross-Section (S8A MP 28.3 to S8A MP 29.2)

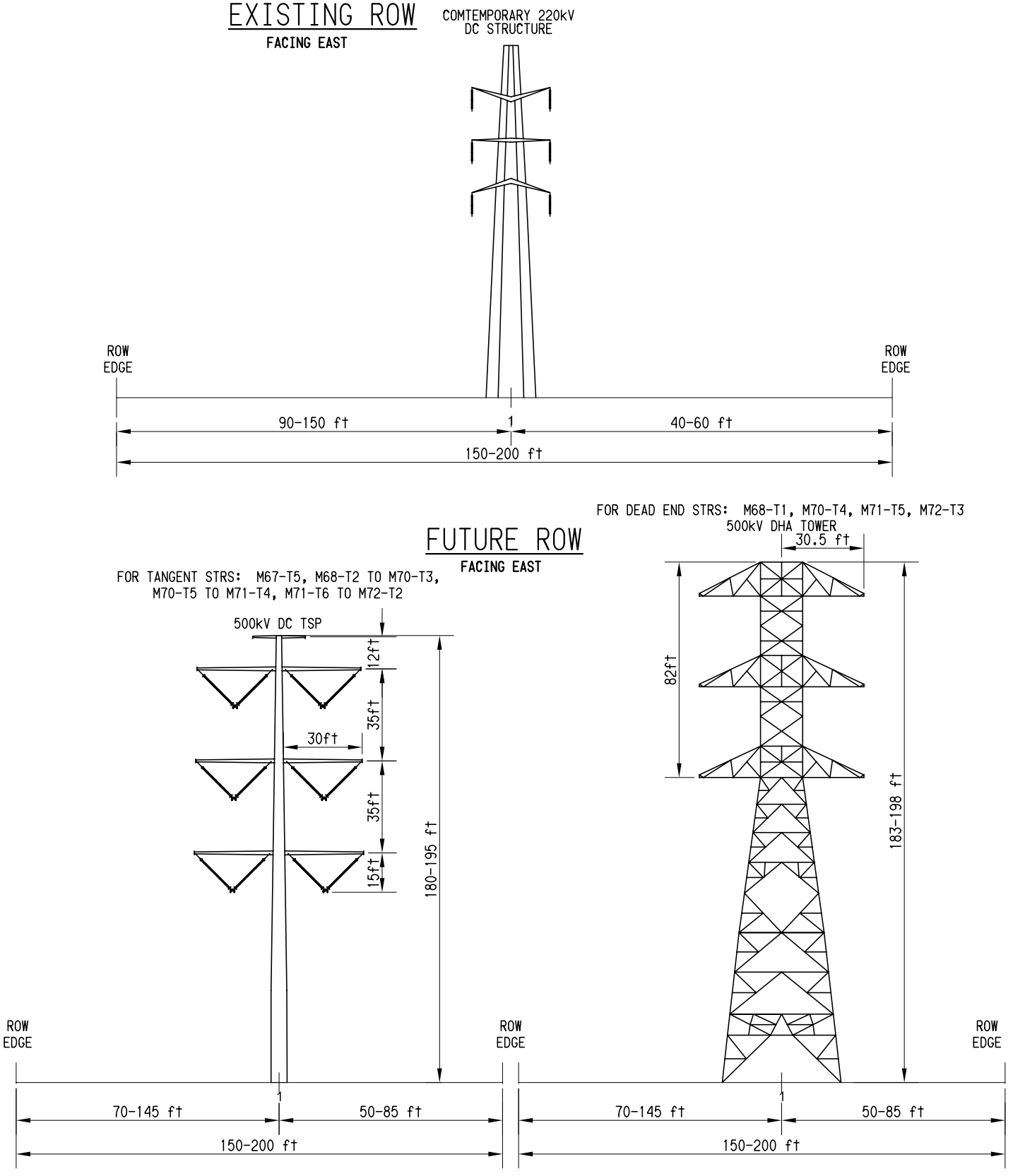




Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

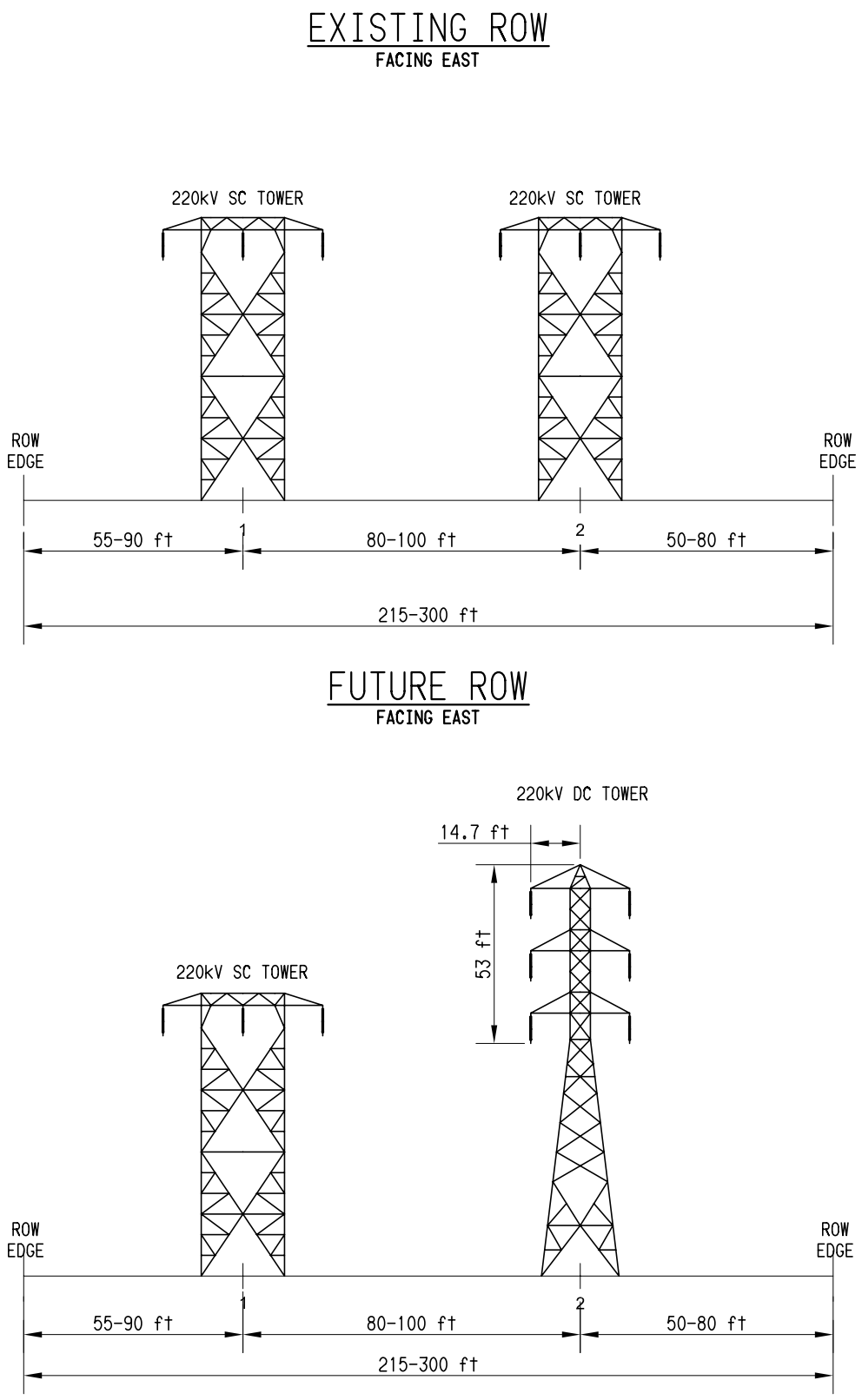
Figure 2.2-46
Segment 8 ROW Cross-Section (S8B MP 0.35 to S8B MP 0.75)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

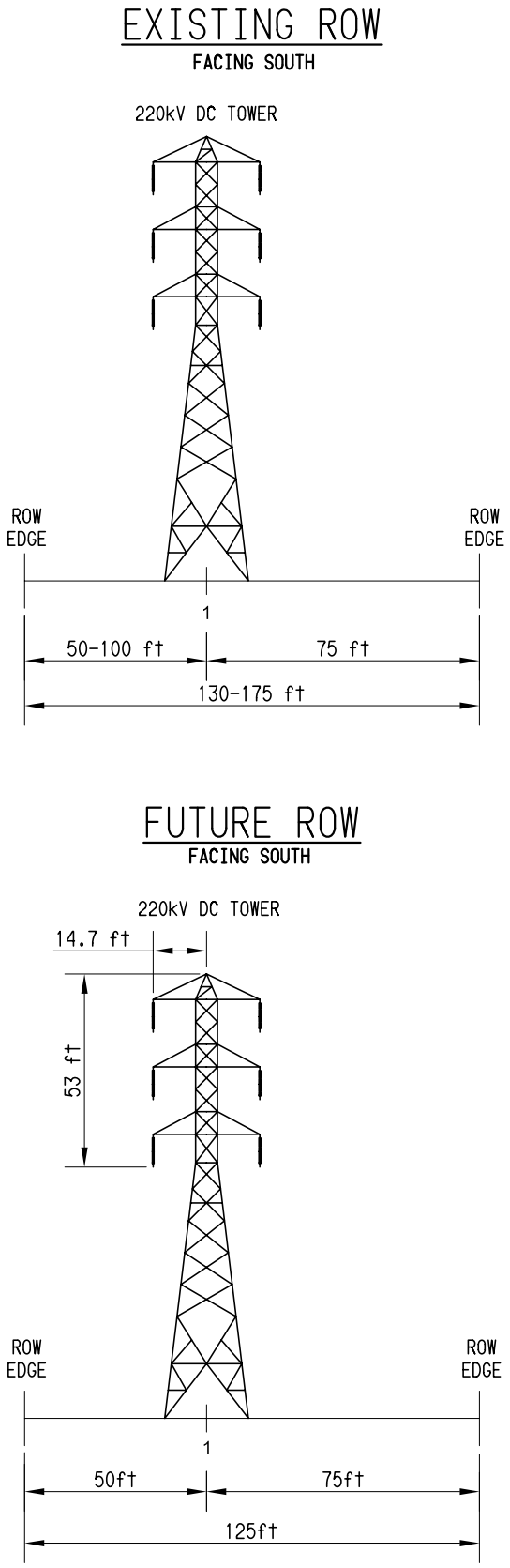
Figure 2.2-47
Segment 8 ROW Cross-Section (S8A MP 29.2 to S8A MP 34.0)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

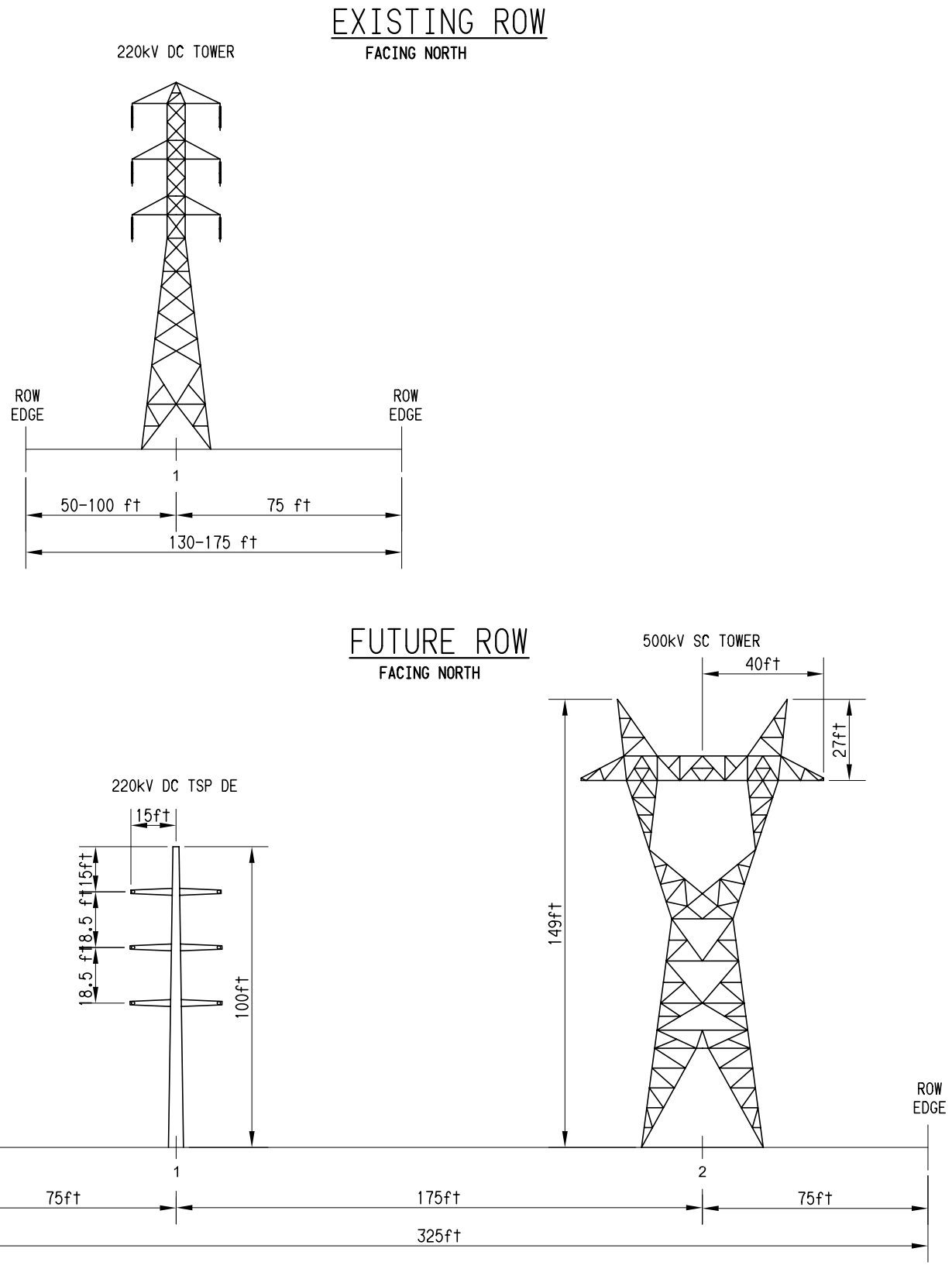
Figure 2.2-48
Segment 8 ROW Cross-Section (S8B MP 0.75 to S8B MP 5.05)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

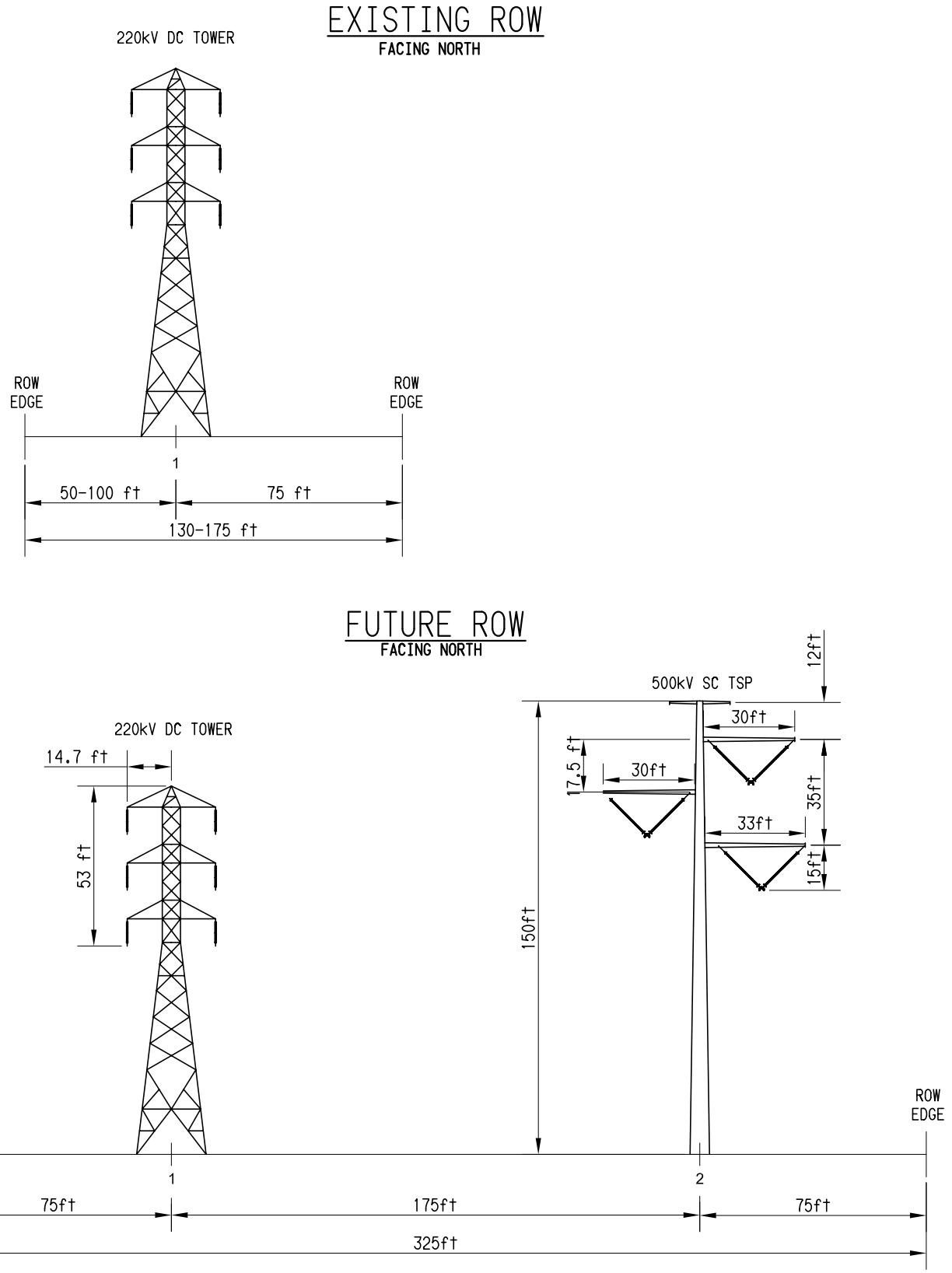
Figure 2.2-49
Segment 8 ROW Cross-Section (S8B MP 5.05 to S8B MP 5.65)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

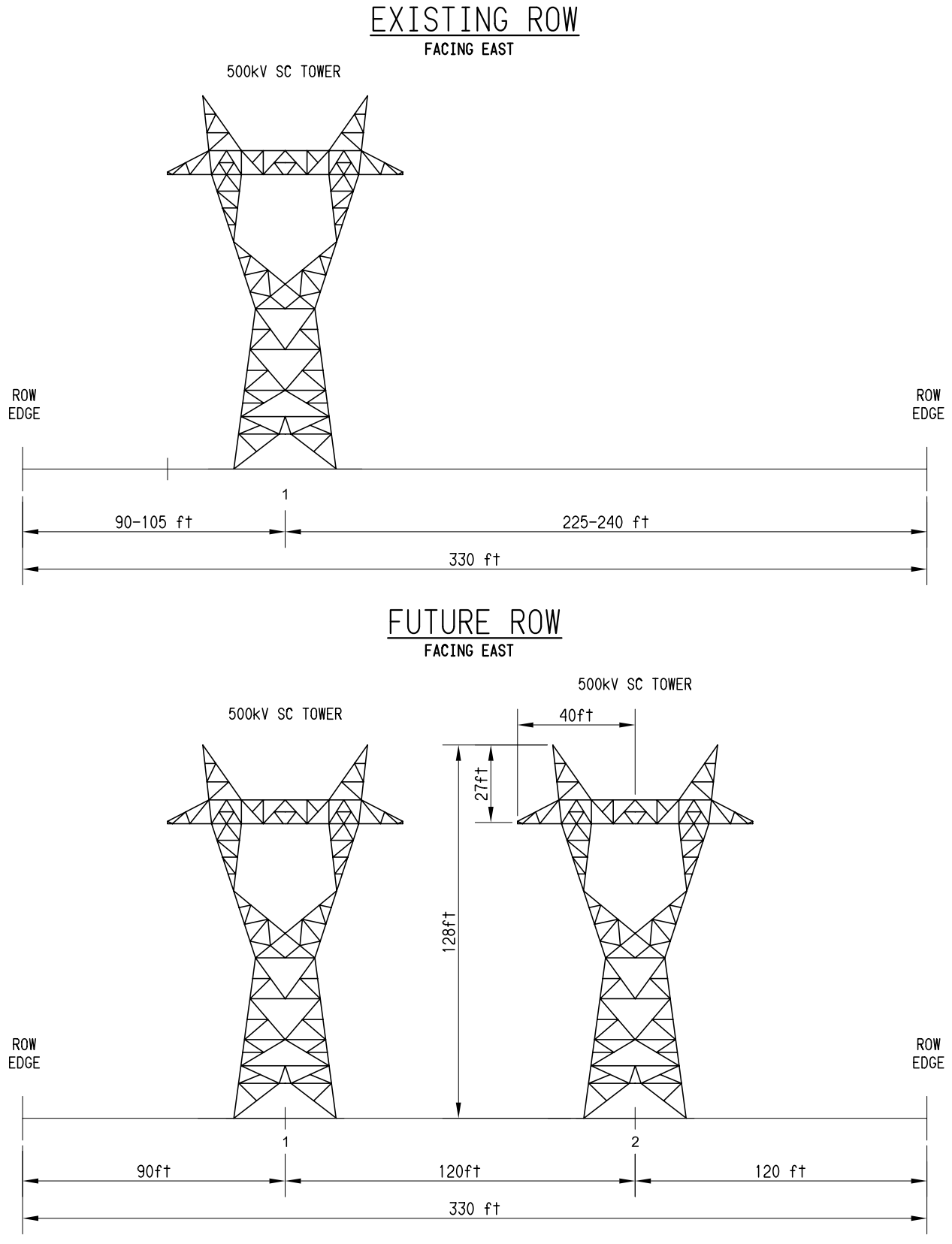
Figure 2.2-50
Segment 8 ROW Cross-Section (S8A MP 34.0 to S8A MP 34.15)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

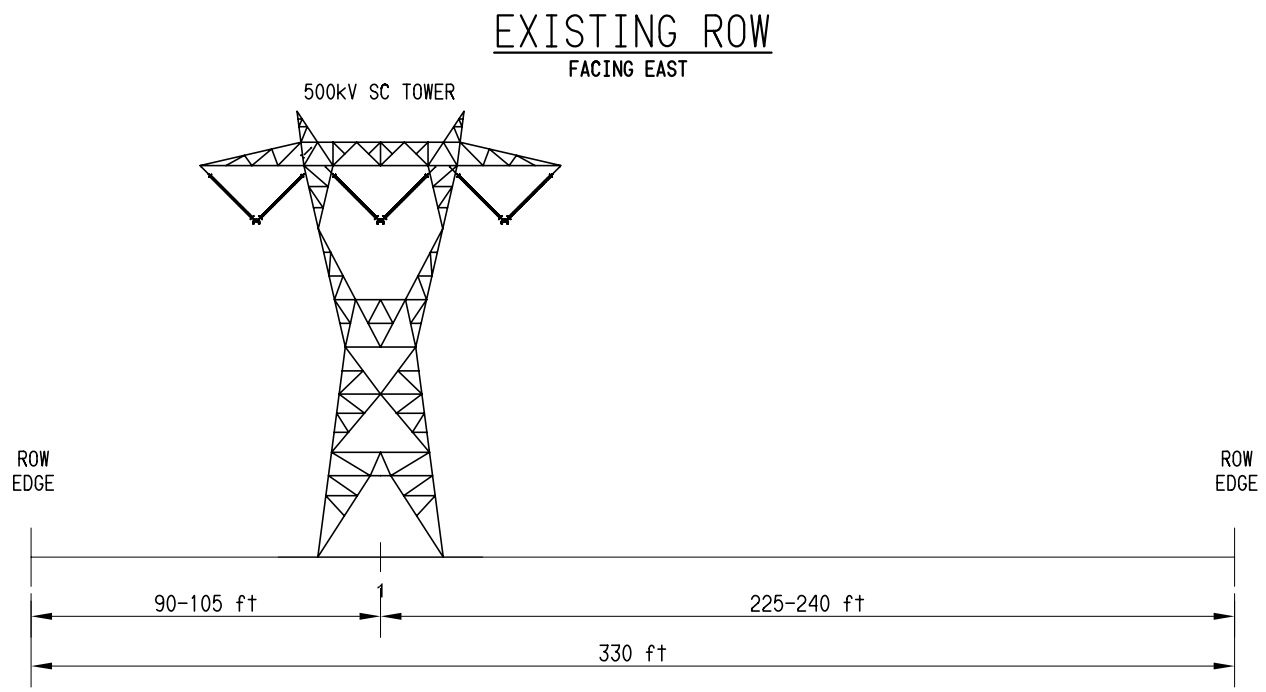
Figure 2.2-51
Segment 8 ROW Cross-Section (S8A MP 34.15 to S8A MP 34.4)

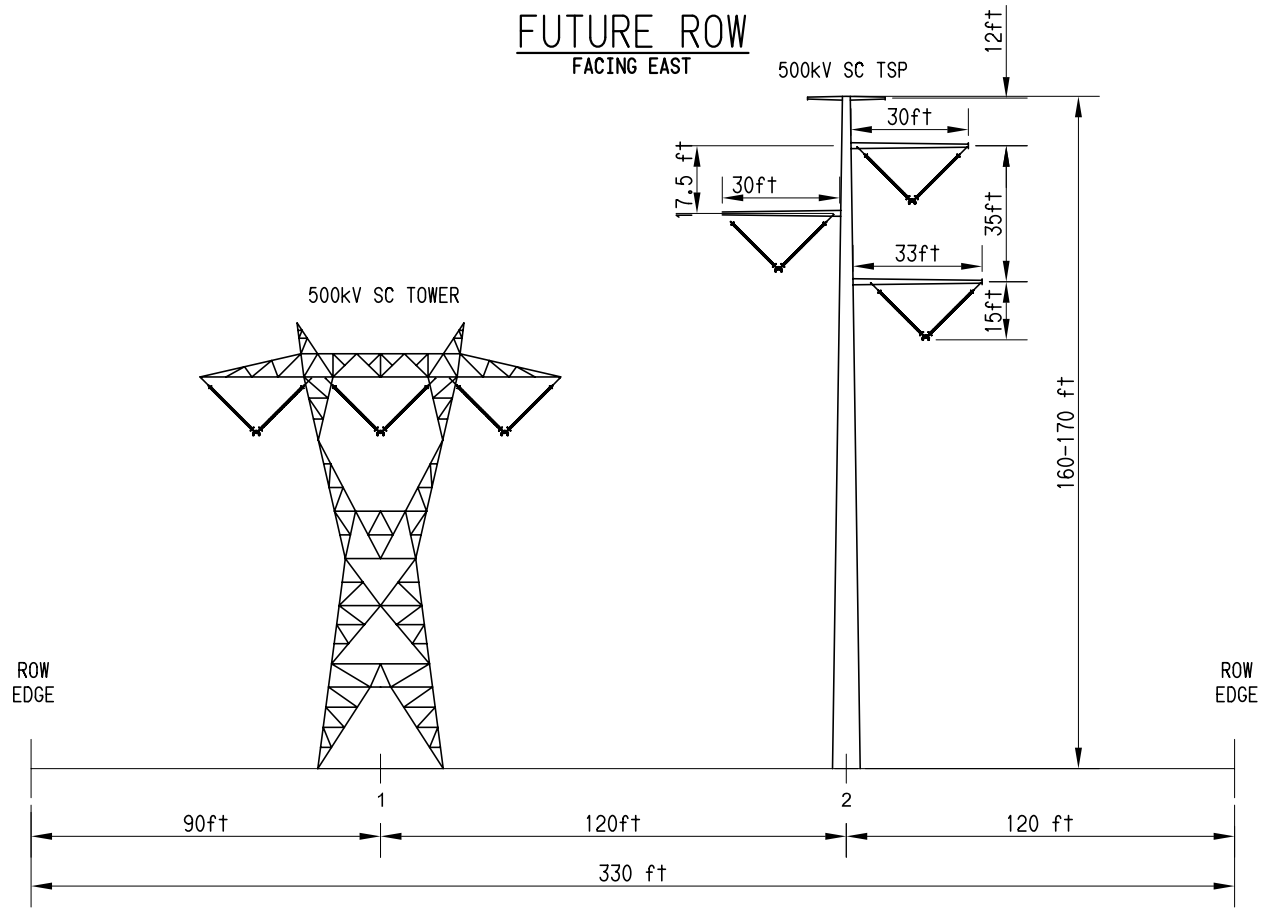


Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Figure 2.2-52
Segment 8 ROW Cross-Section (S8A MP 34.4 to S8A MP 34.5)

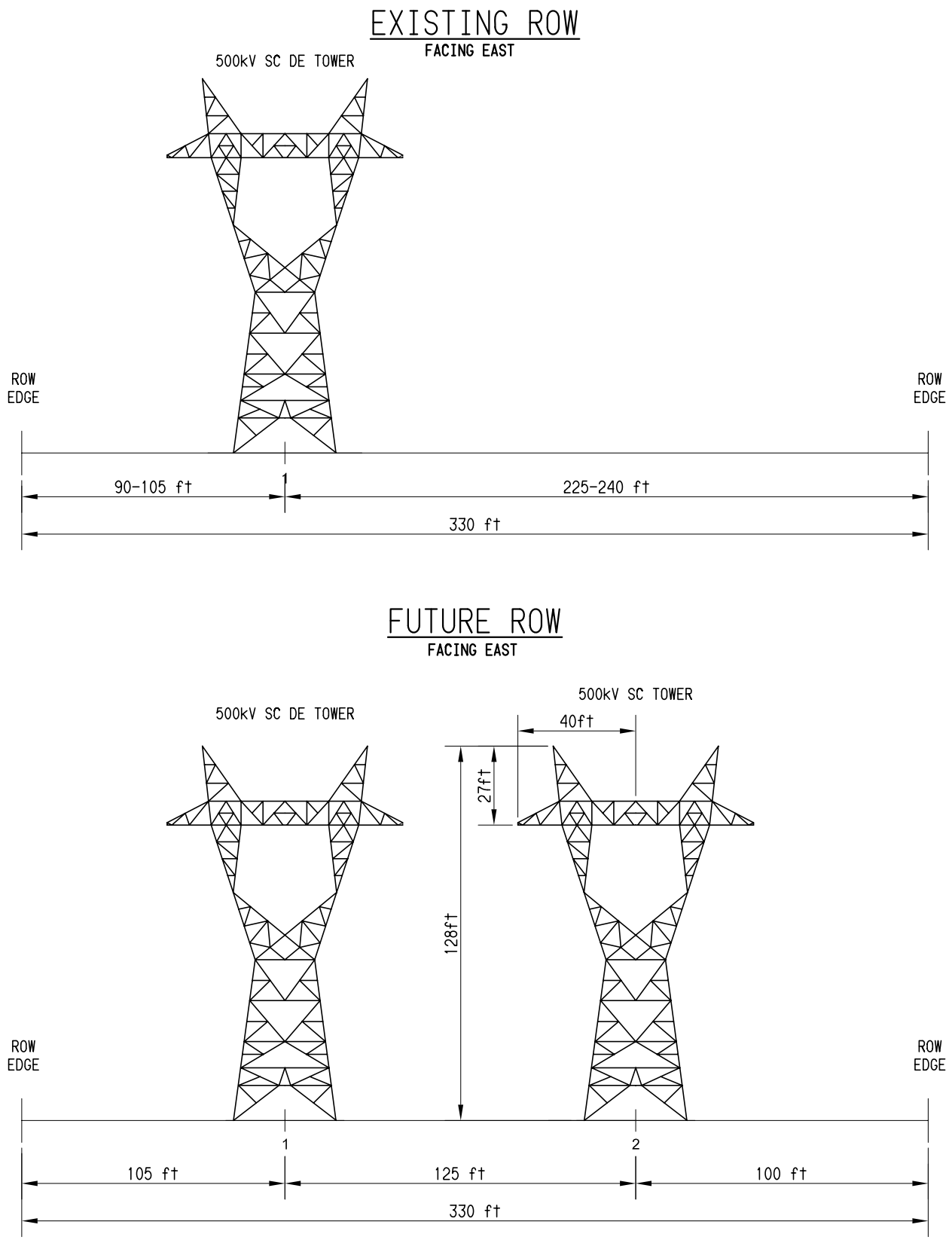




Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

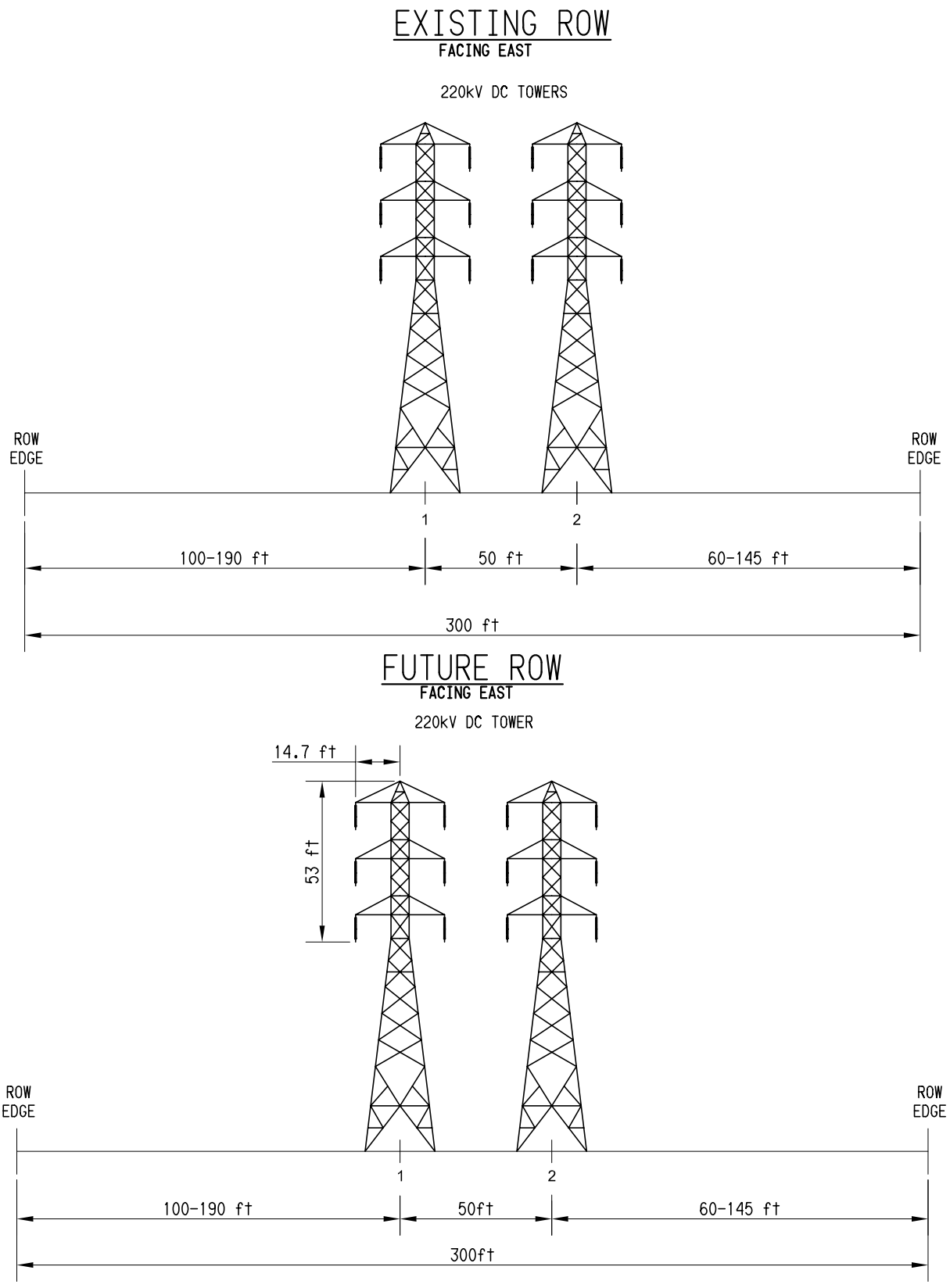
Figure 2.2-53
Segment 8 ROW Cross-Section (S8A MP 34.5 to S8A MP 35.0)



Source: SCE, 2007d.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

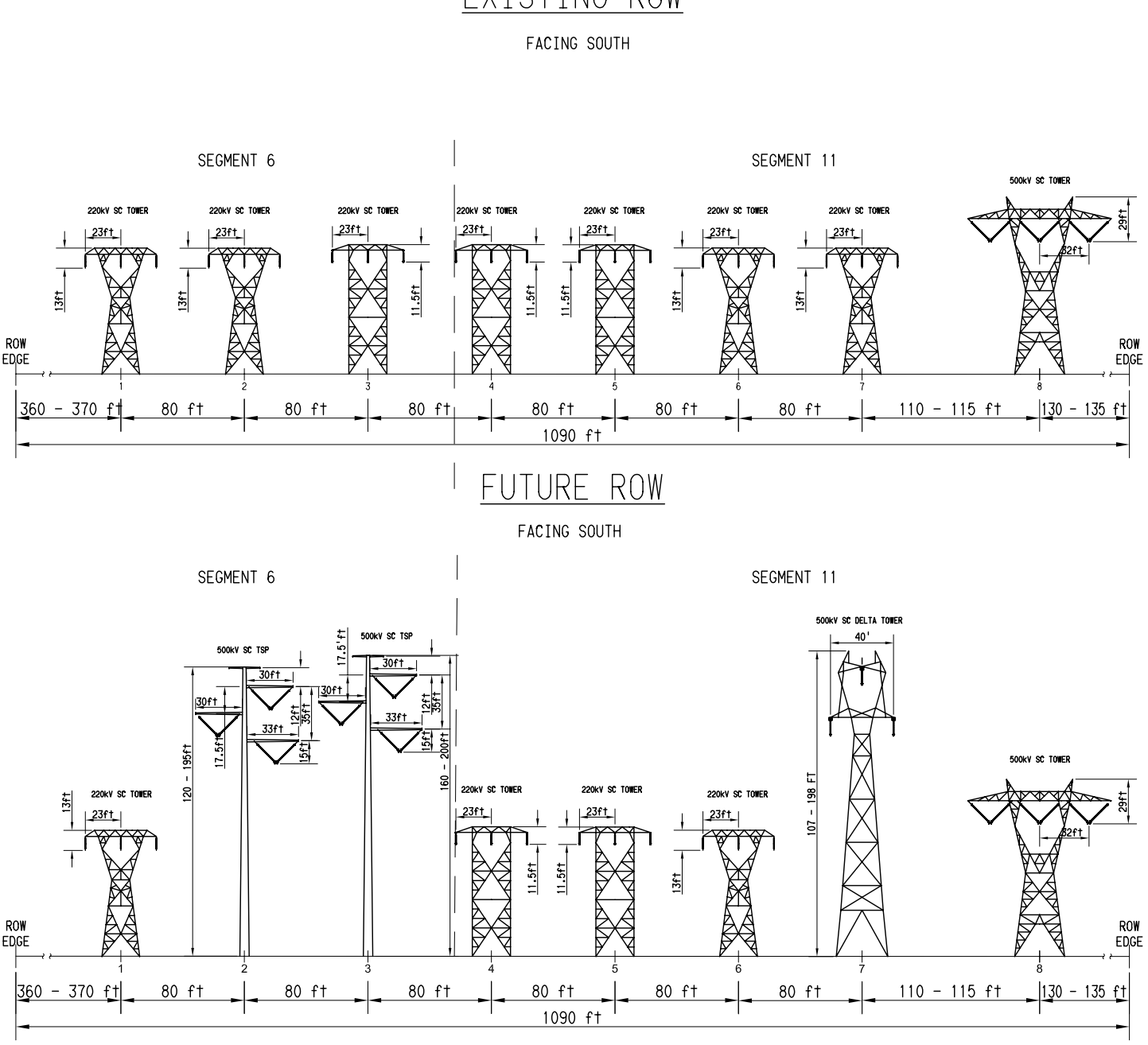
Figure 2.2-54
Segment 8 ROW Cross-Section (S8A MP 35.0 to S8A MP 35.2)



Source: SCE, 2007d.

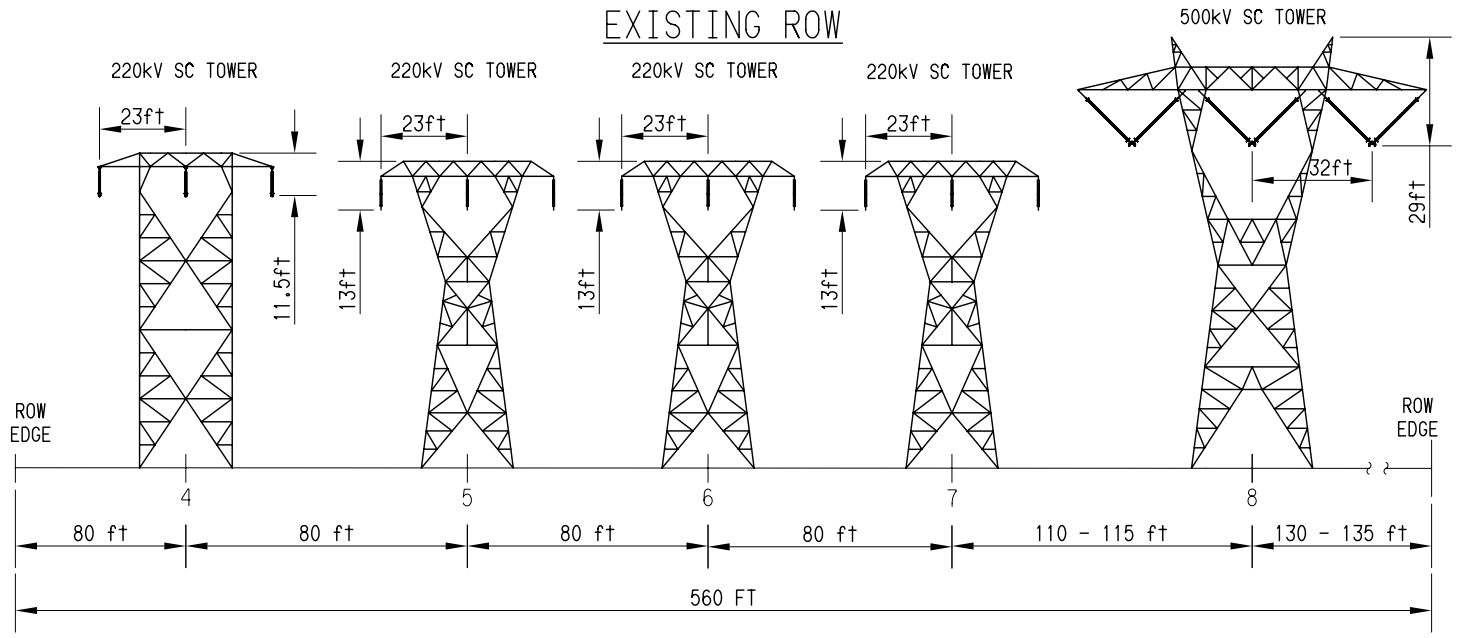
NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

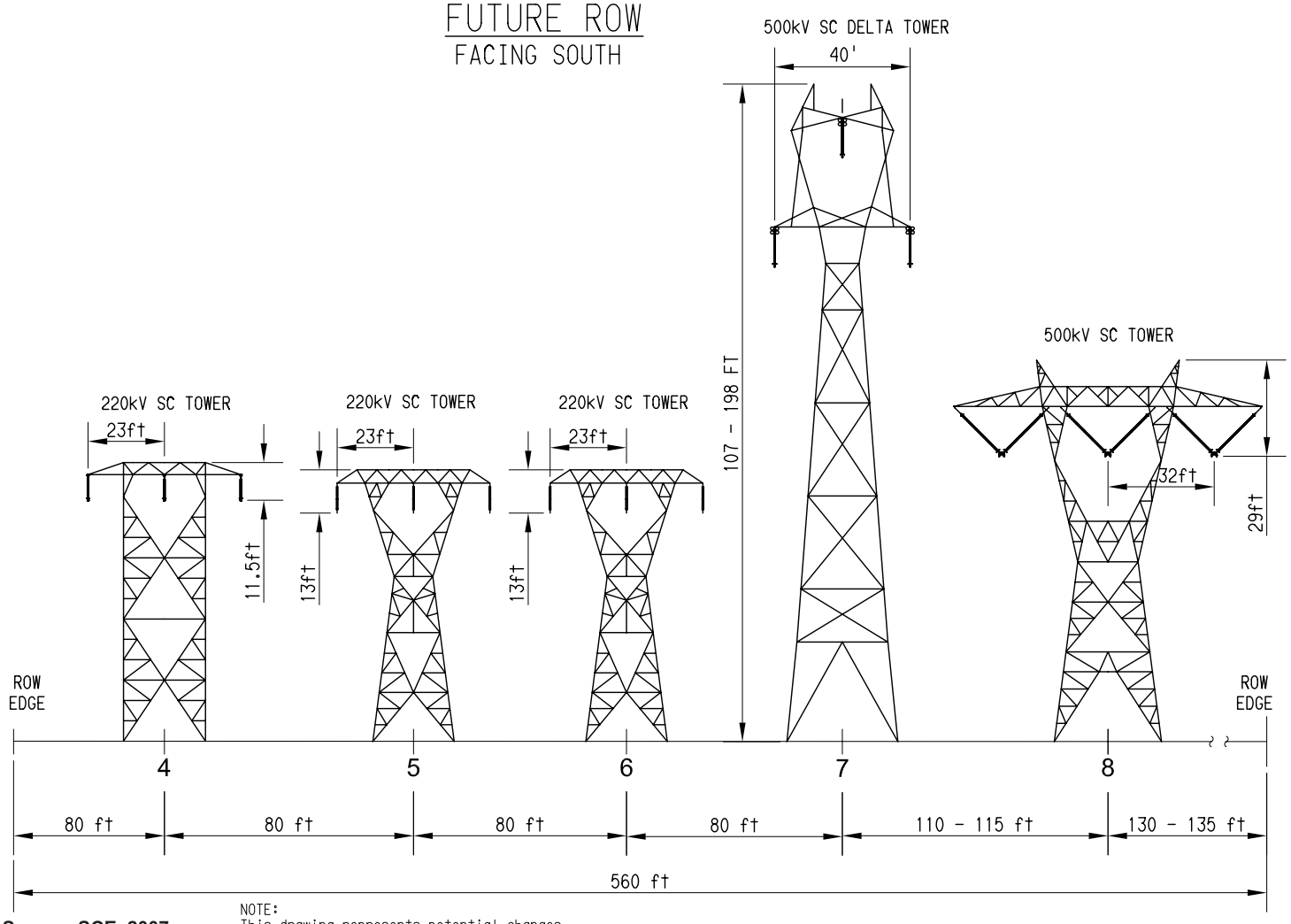
Figure 2.2-55
Segment 8 ROW Cross-Section (S8B MP 6.0 to S8B MP 6.8)



Source: SCE, 2007c.

Figure 2.2-56
Segment 11 ROW Cross-Section (S11 MP 0.0 to S11 MP 0.9)



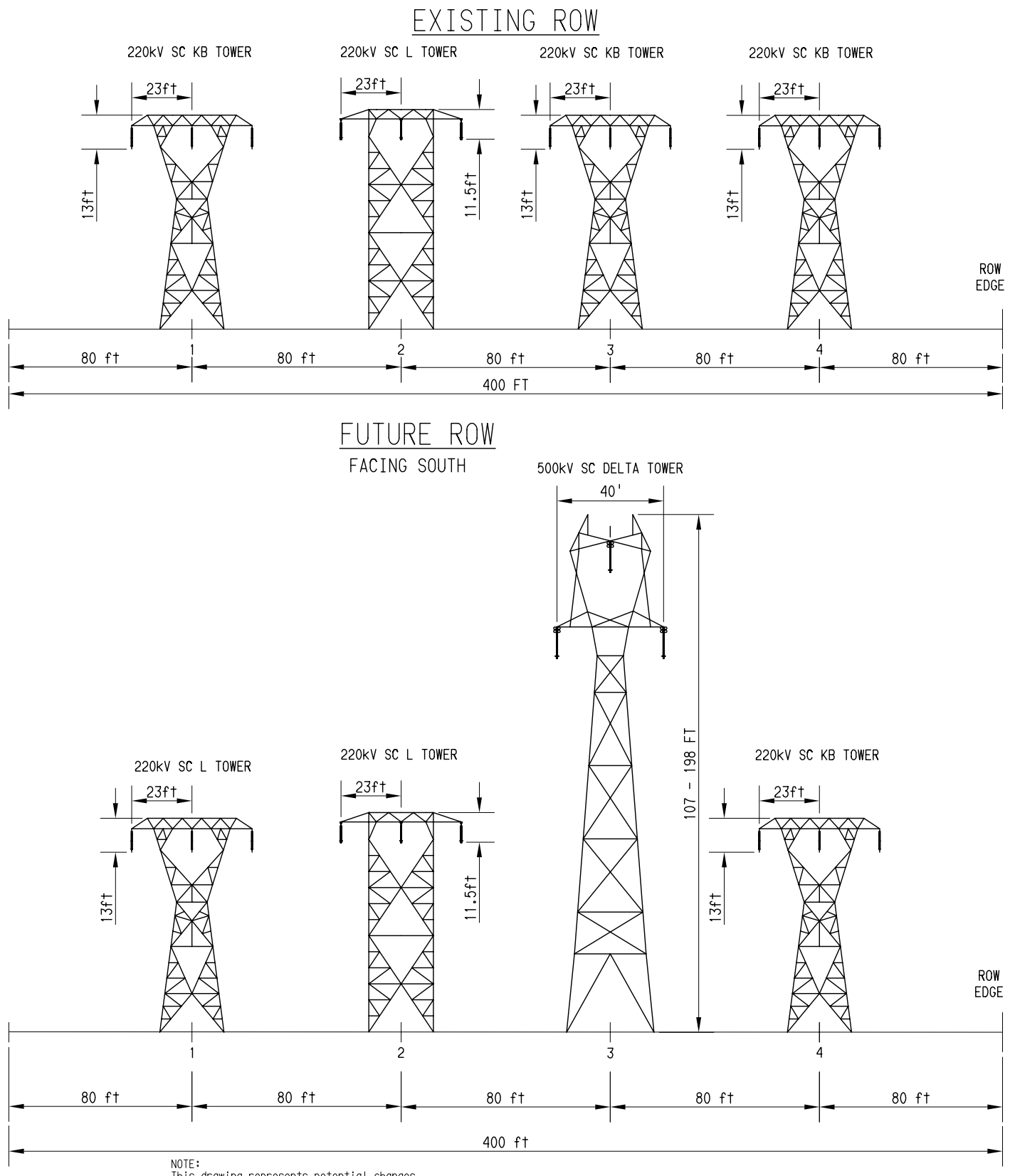


Source: SCE, 2007c.

NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Figure 2.2-57

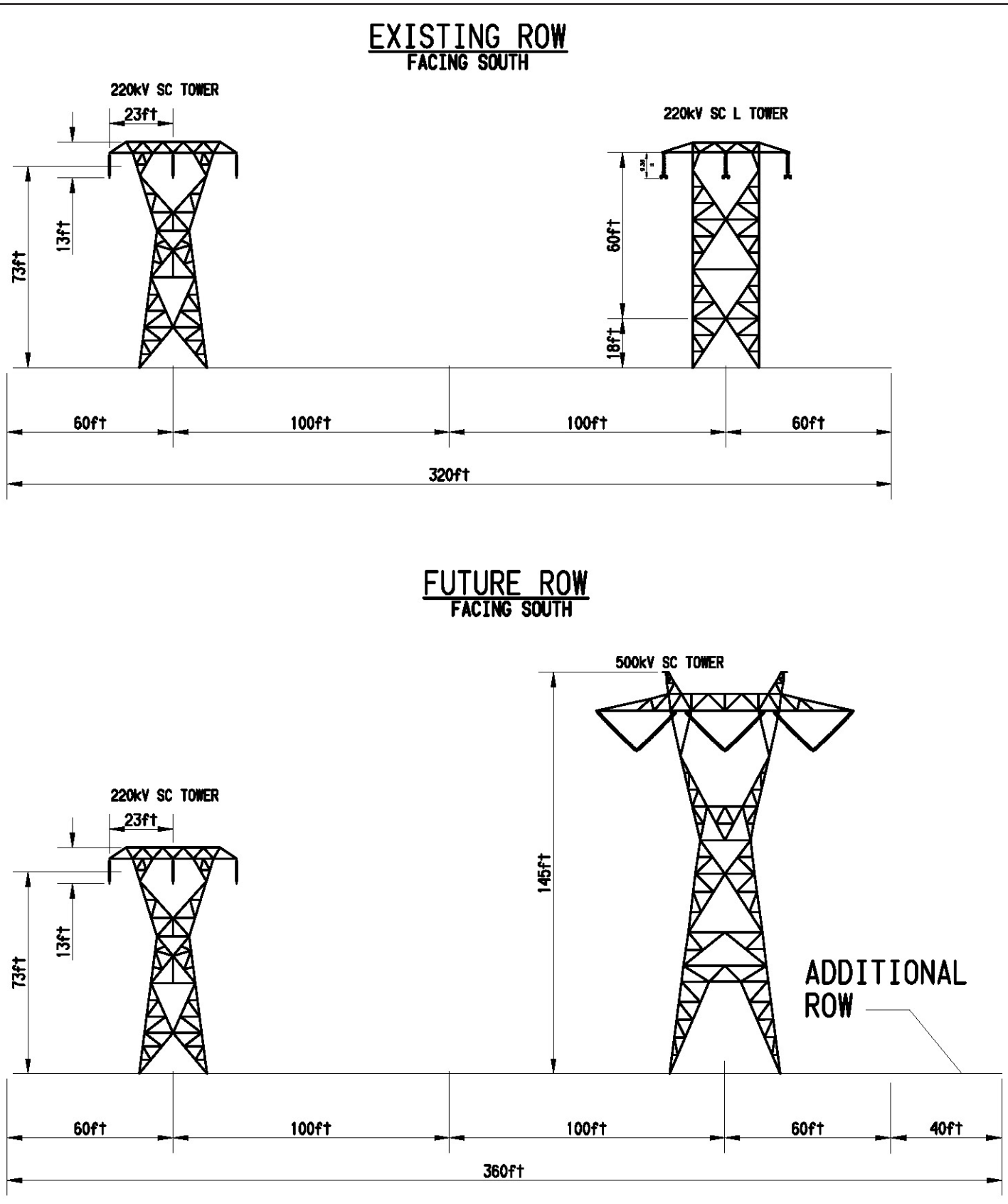
Segment 11 ROW Cross-Section (S11 MP 0.9 to S11 MP 2.5)



Source: SCE, 2007c.

Figure 2.2-58

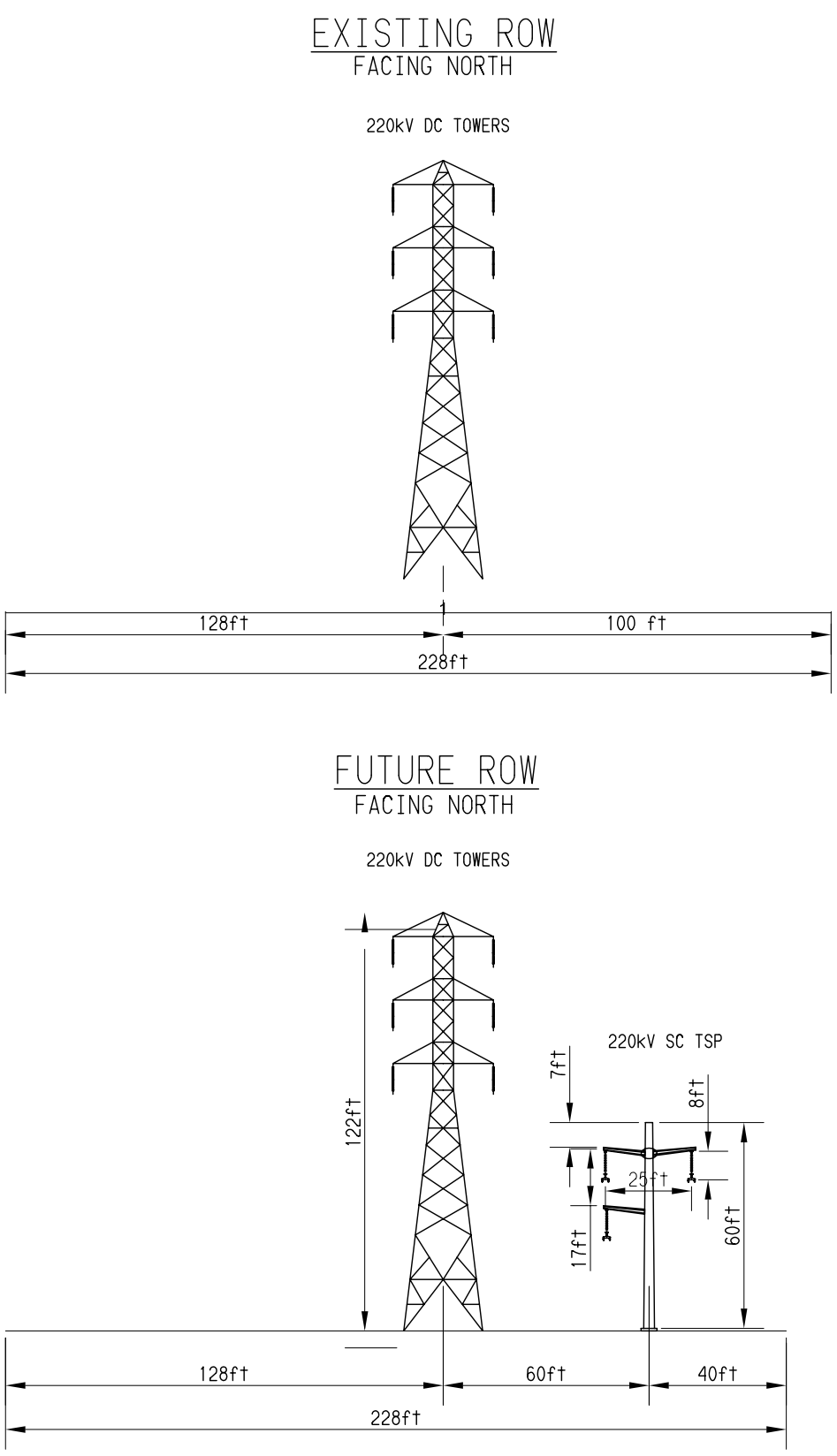
Segment 11 ROW Cross-Section (S11 MP 2.5 to S11 MP 4.0)



Source: SCE, 2009d.

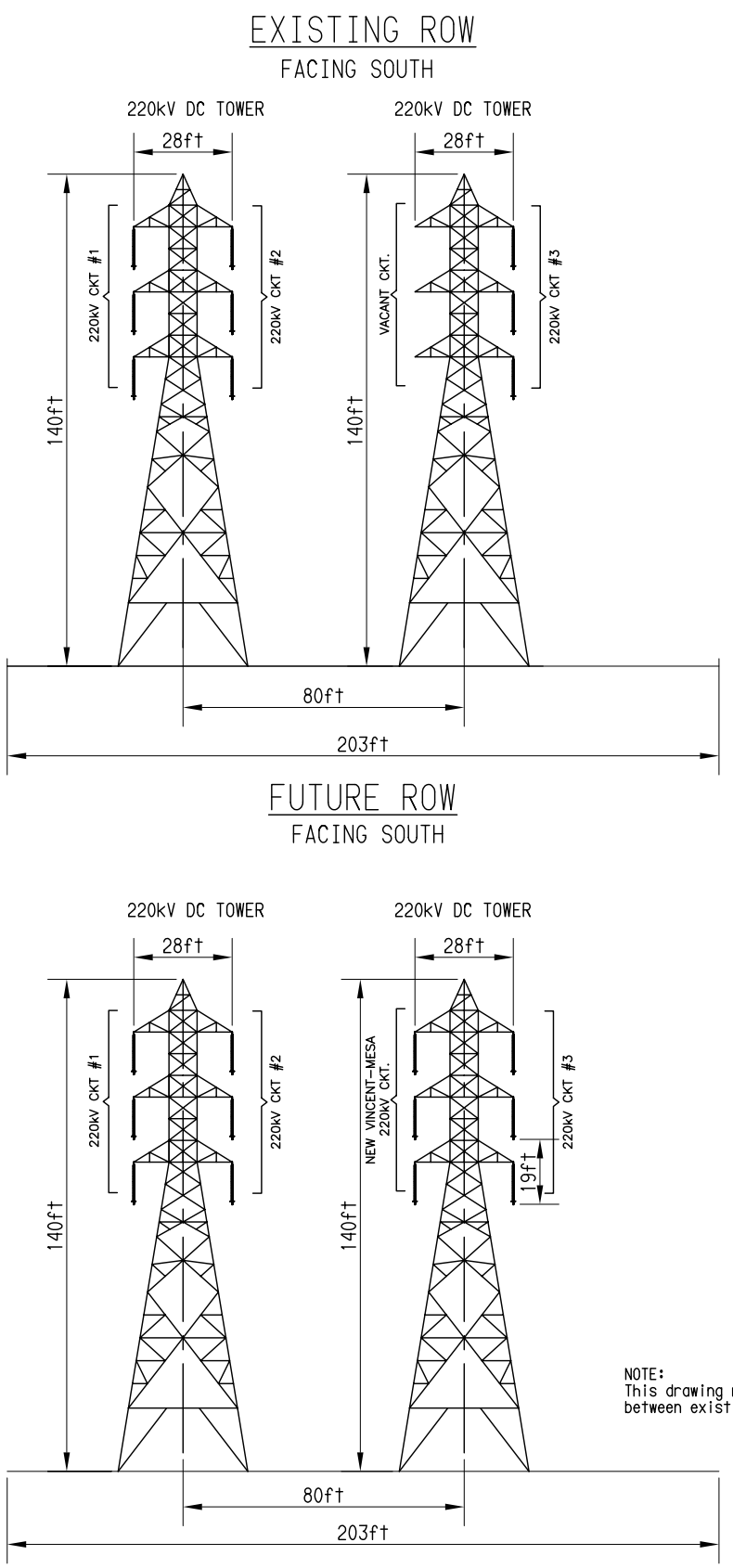
Figure 2.2-59 (Revised)

Segment 11 ROW Cross-Section (S11 MP 4.0 to S11 MP 18.7)



Source: SCE, 2007c.

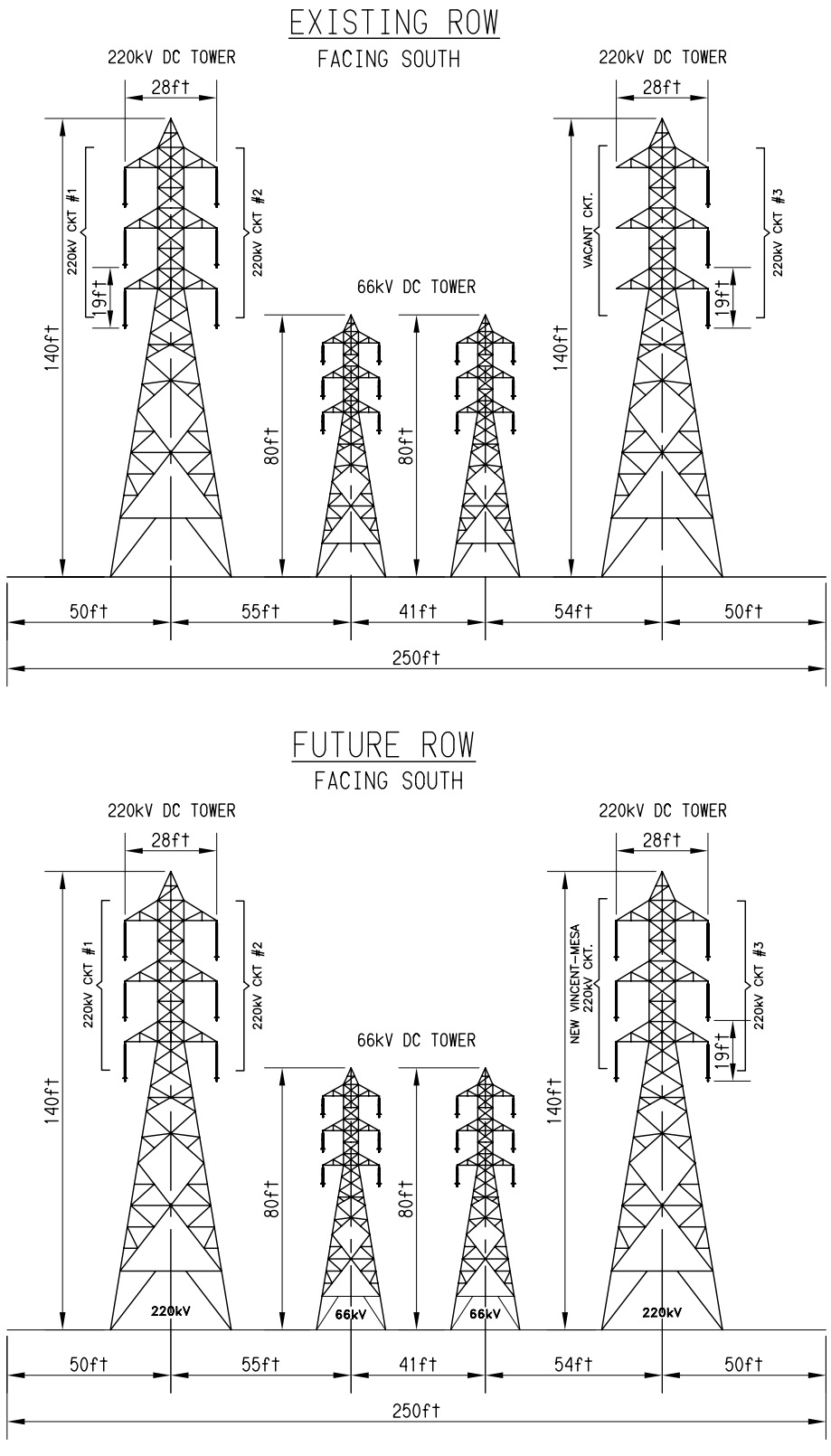
Figure 2.2-60
Segment 11 ROW Cross-Section (S11 MP 18.7 to S11 MP 18.85)



Source: SCE, 2007c.

Figure 2.2-61

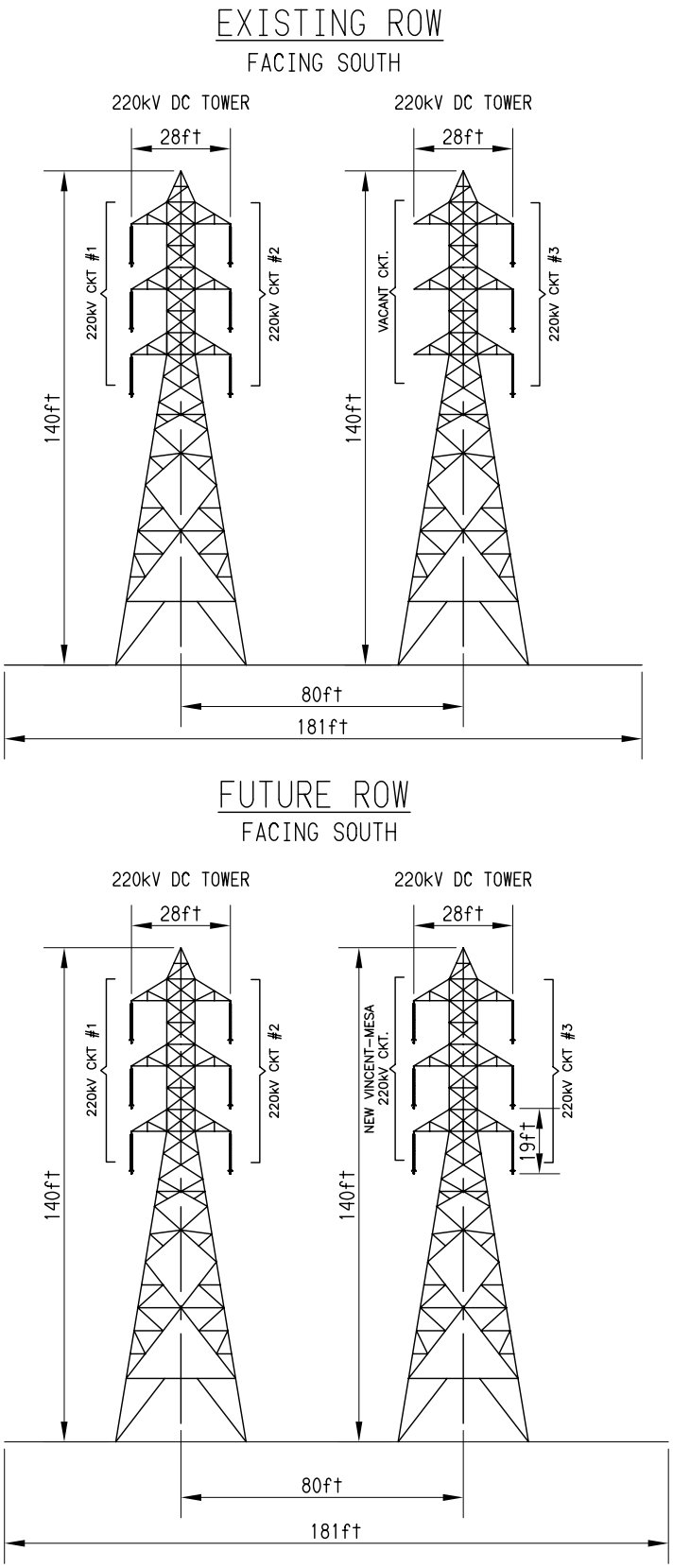
Segment 11 ROW Cross-Section (S11 MP 18.85 to S11 MP 26.2)



NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

Source: SCE, 2007c.

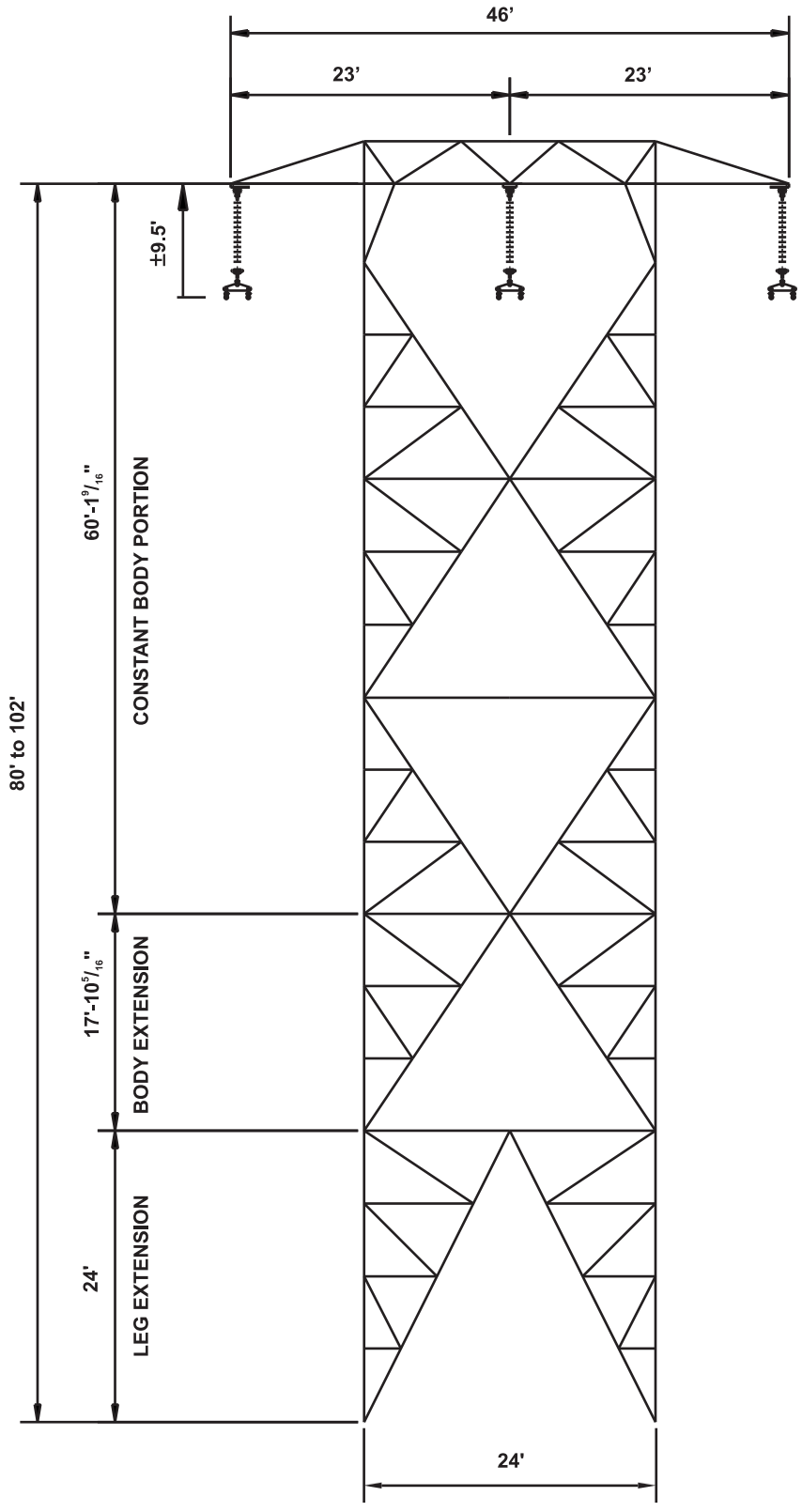
Figure 2.2-62
Segment 11 ROW Cross-Section (S11 MP 26.2 to S11 MP 35.8)



NOTE:
This drawing represents potential changes between existing and future ROW cross sections.

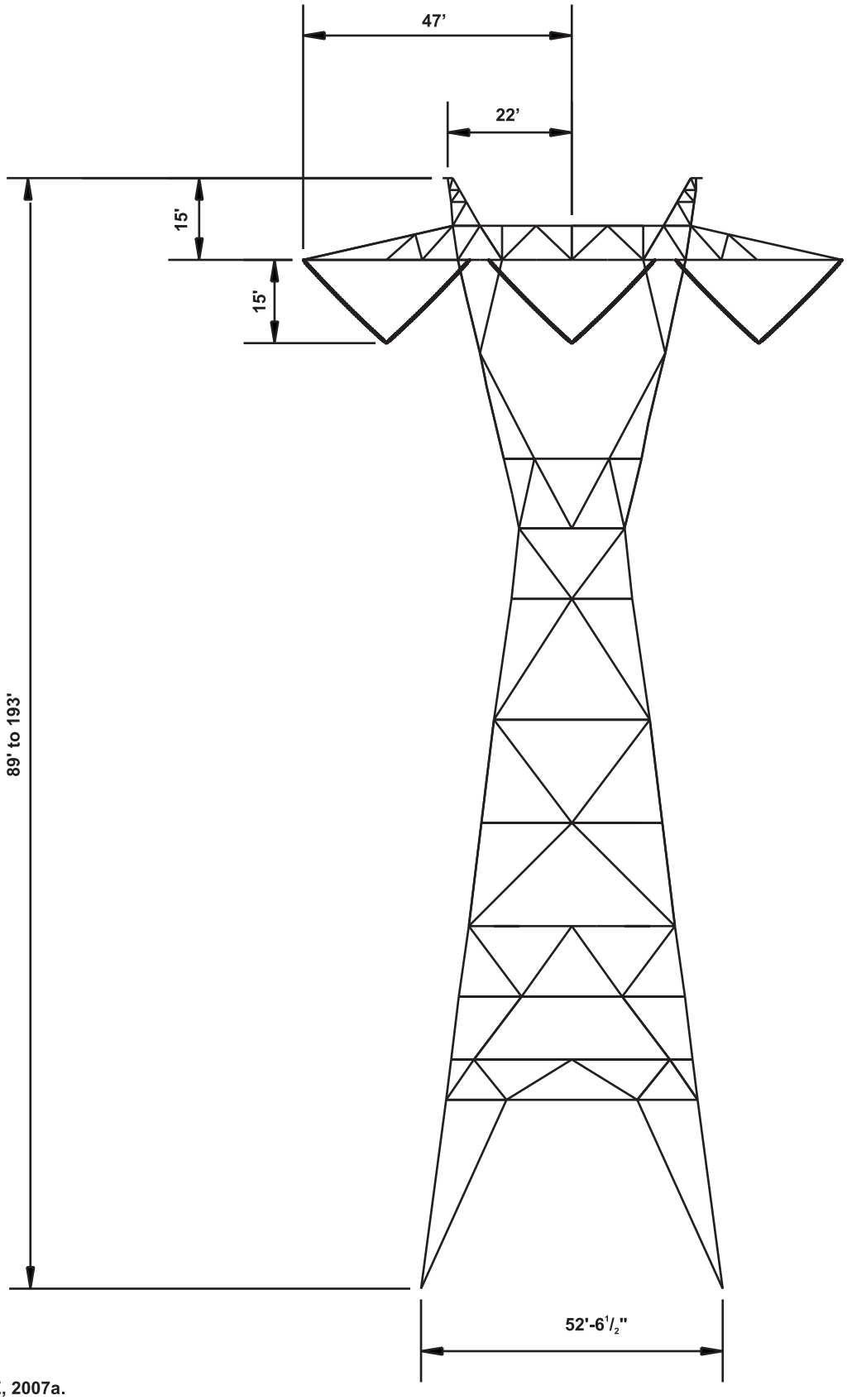
Source: SCE, 2007c.

Figure 2.2-63
Segment 11 ROW Cross-Section (S11 MP 35.8 to S11 MP 36.2)



Source: SCE, 2007a.

Figure 2.2-64
Typical 220-kV Single-Circuit Lattice Steel Tower



Source: SCE, 2007a.

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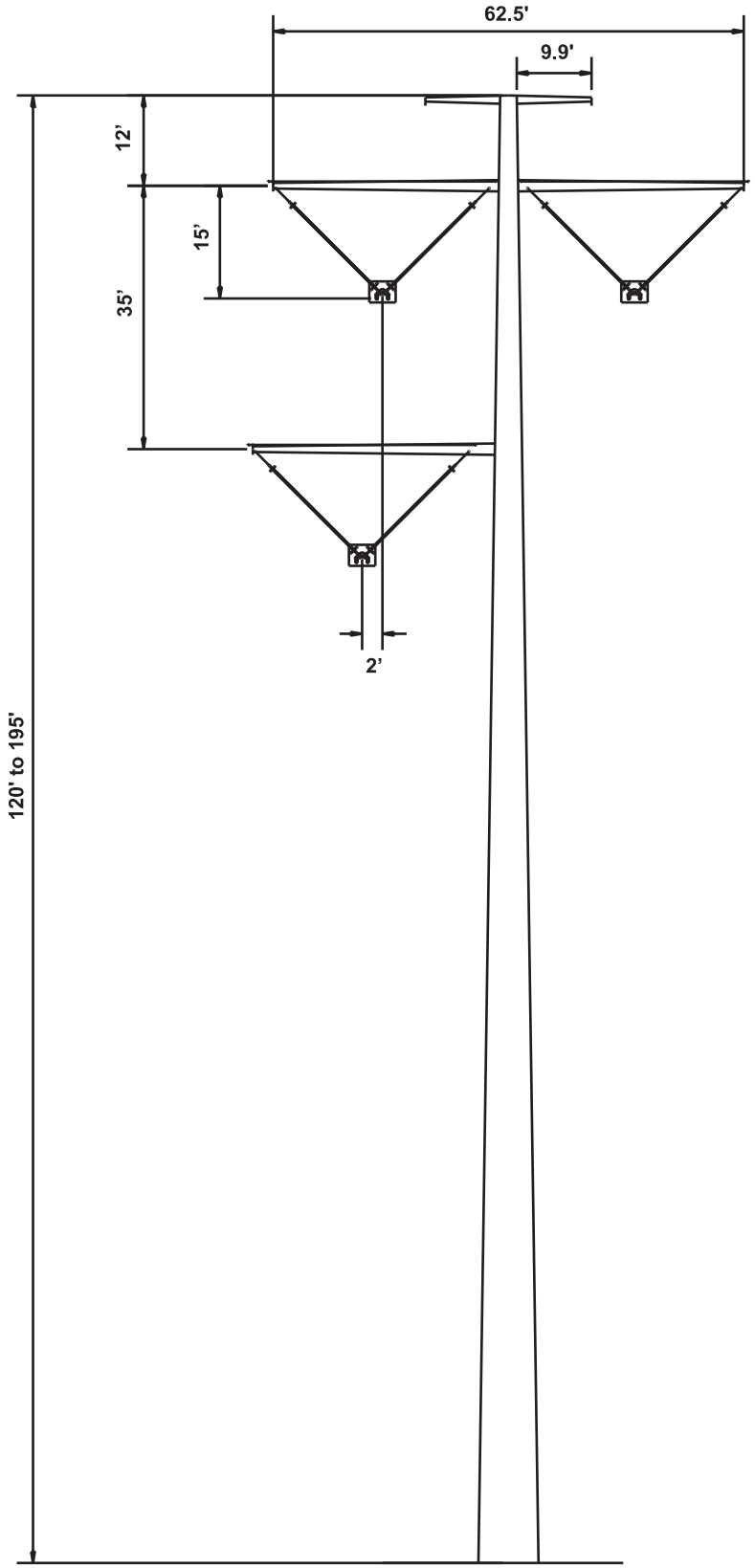
Figure 2.2-65
Typical 500-kV Single-Circuit Lattice Steel Tower



Source: SCE, 2007a.

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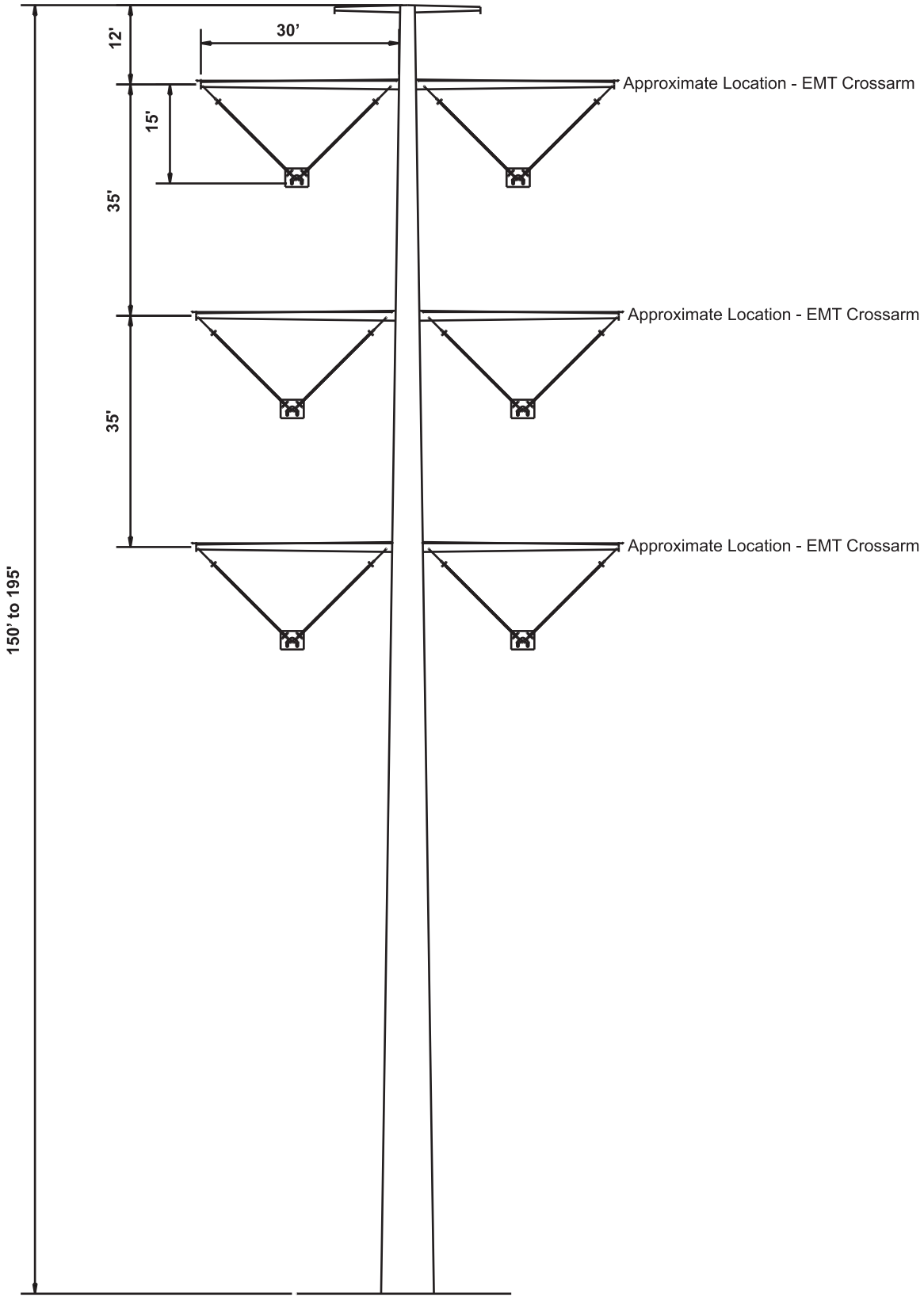
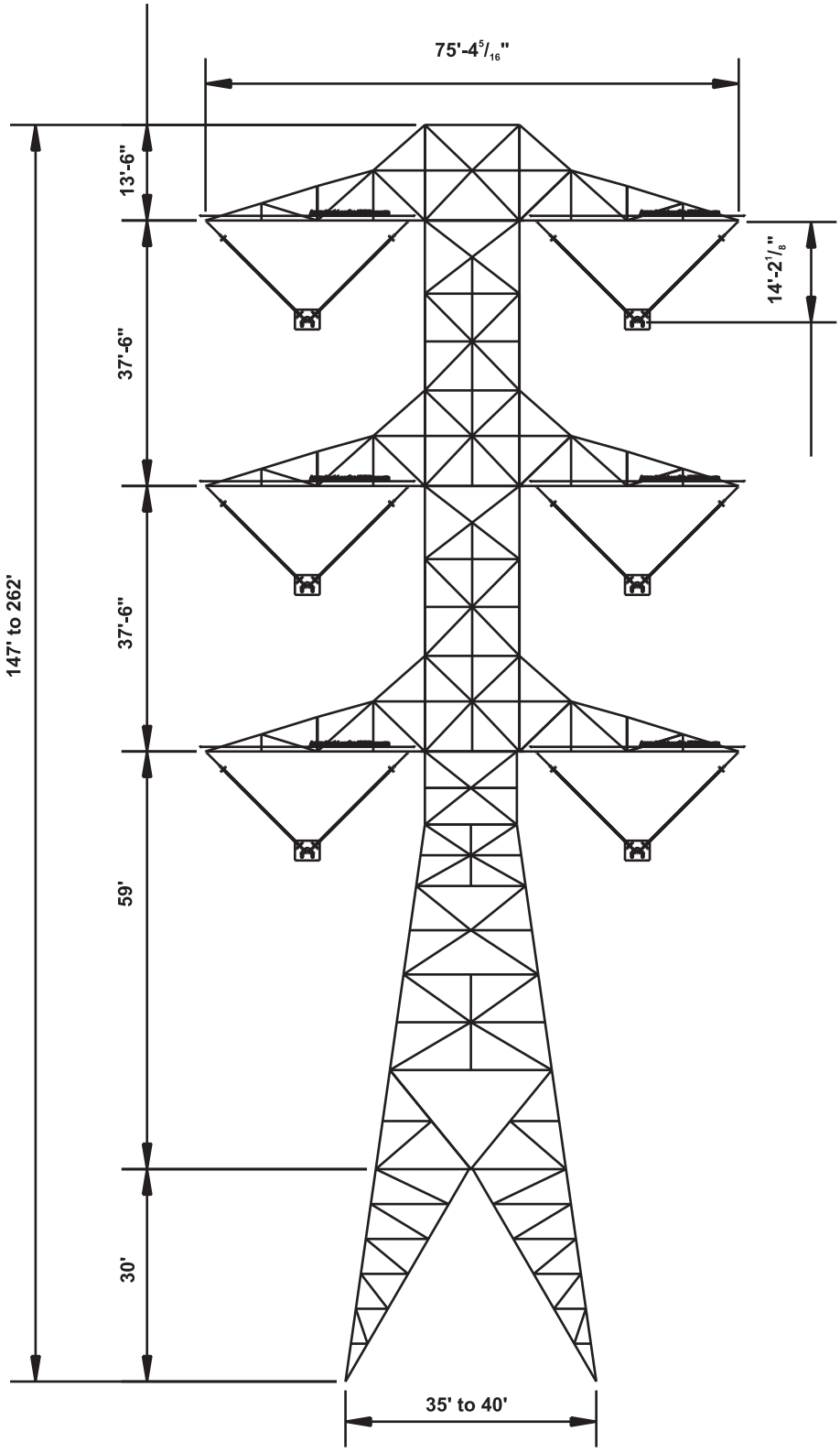
Figure 2.2-66
Typical 500-kV Single-Circuit Tubular Steel Pole



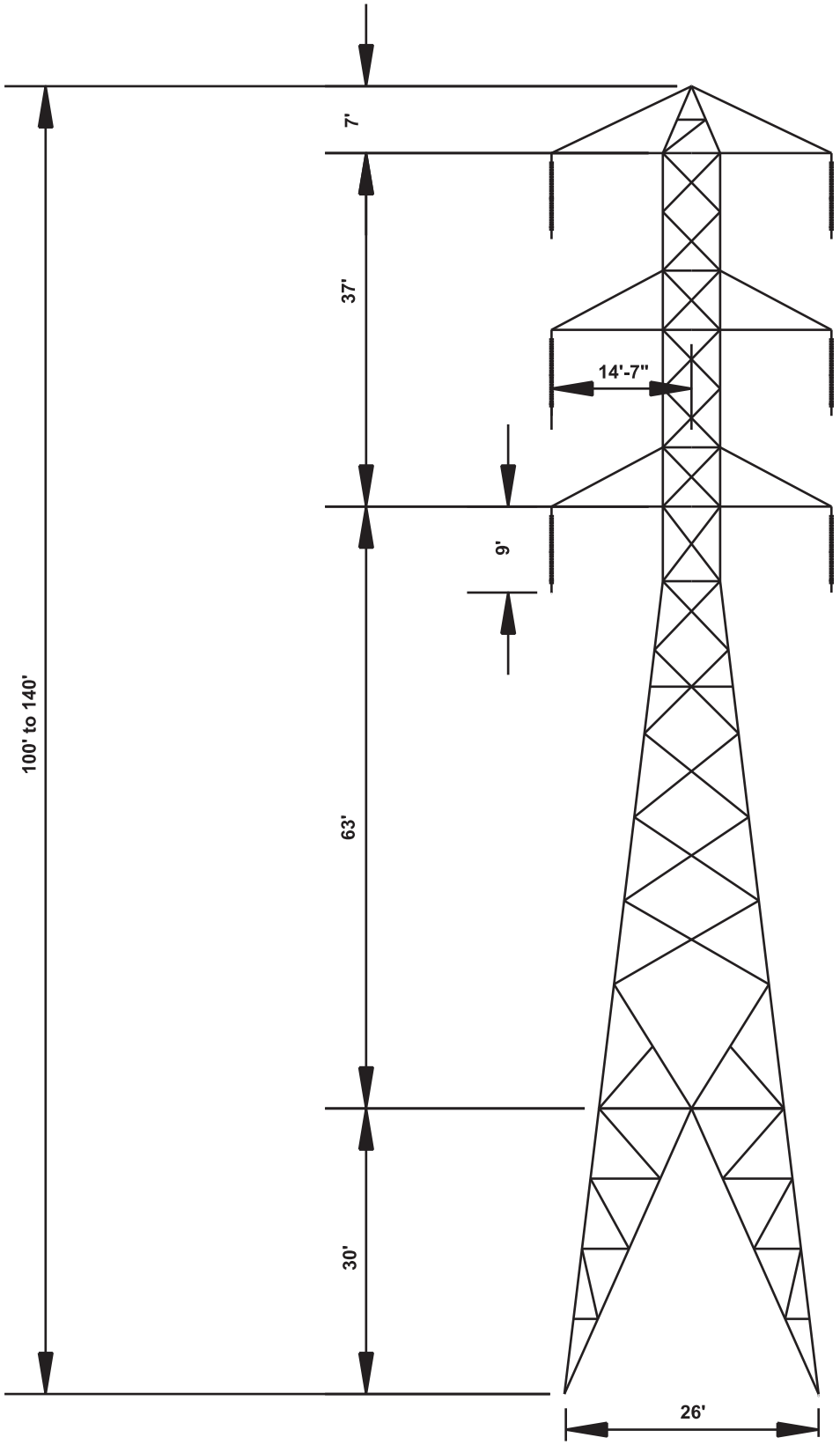
Source: SCE, 2007a.

Figure 2.2-67
Typical 500-kV Double-Circuit Tubular Steel Pole



Source: SCE, 2007a.

Figure 2.2-68
Typical 500-kV Double-Circuit Lattice Steel Tower



Source: SCE, 2007a.

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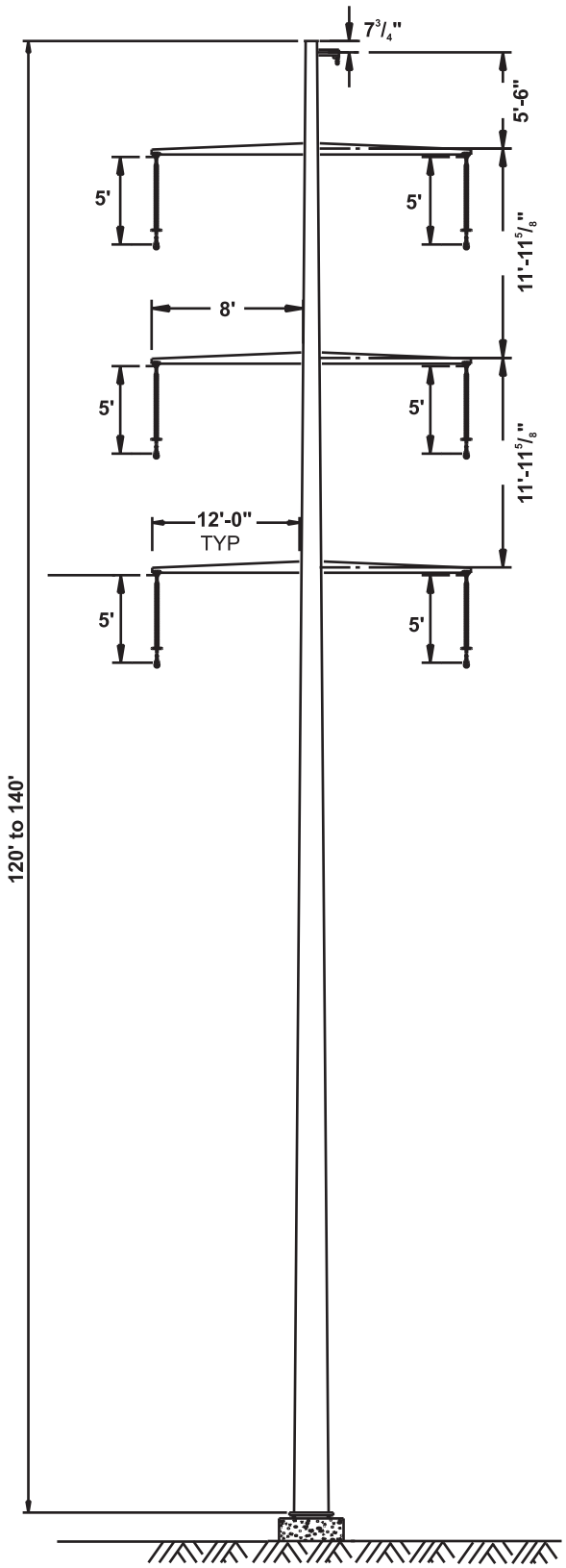
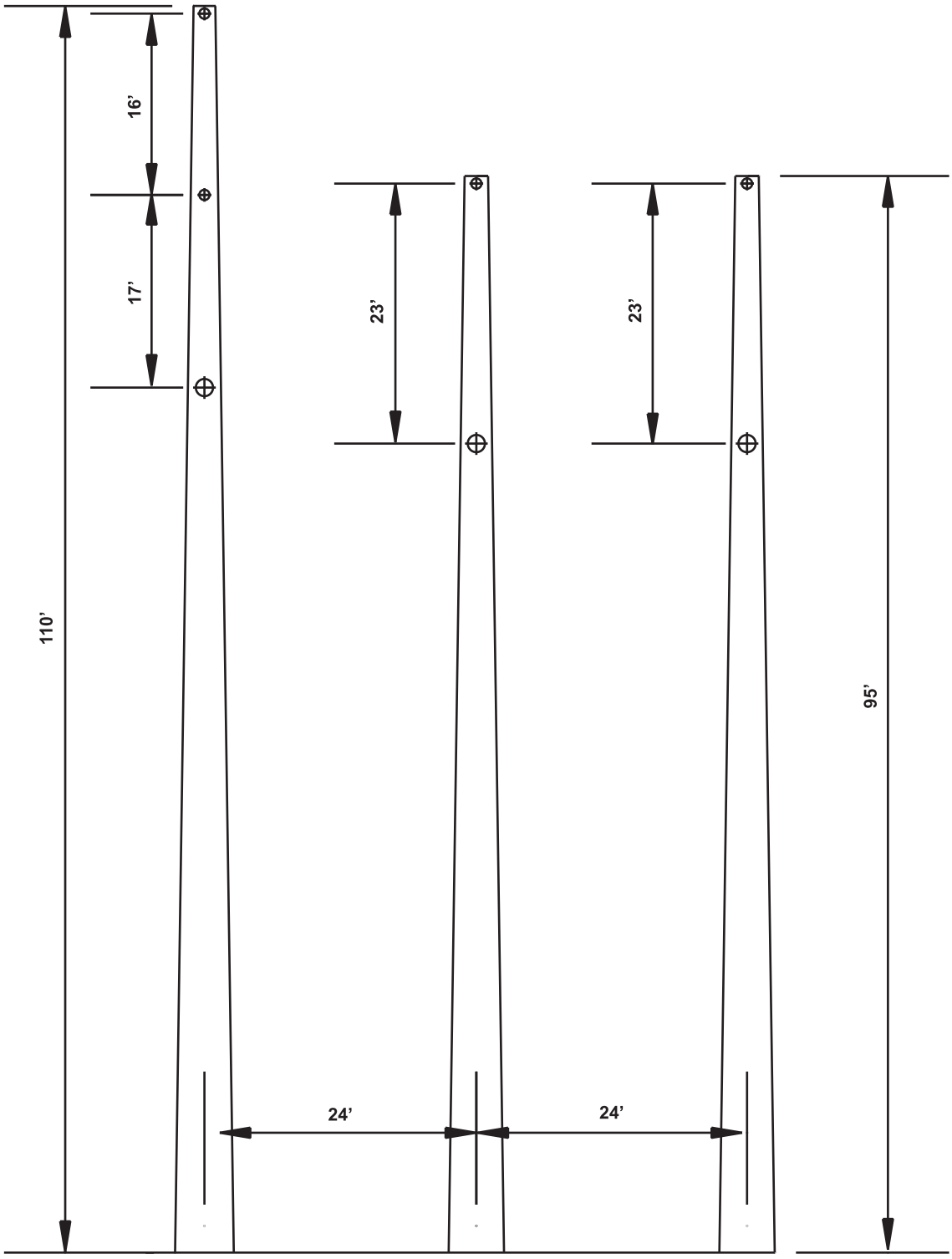
Figure 2.2-69
Typical 220-kV Double-Circuit Lattice Steel Tower



Source: SCE, 2007a.

Figure 2.2-70
Typical 66-kV Double-Circuit Tubular Steel Pole



Source: SCE, 2007a.

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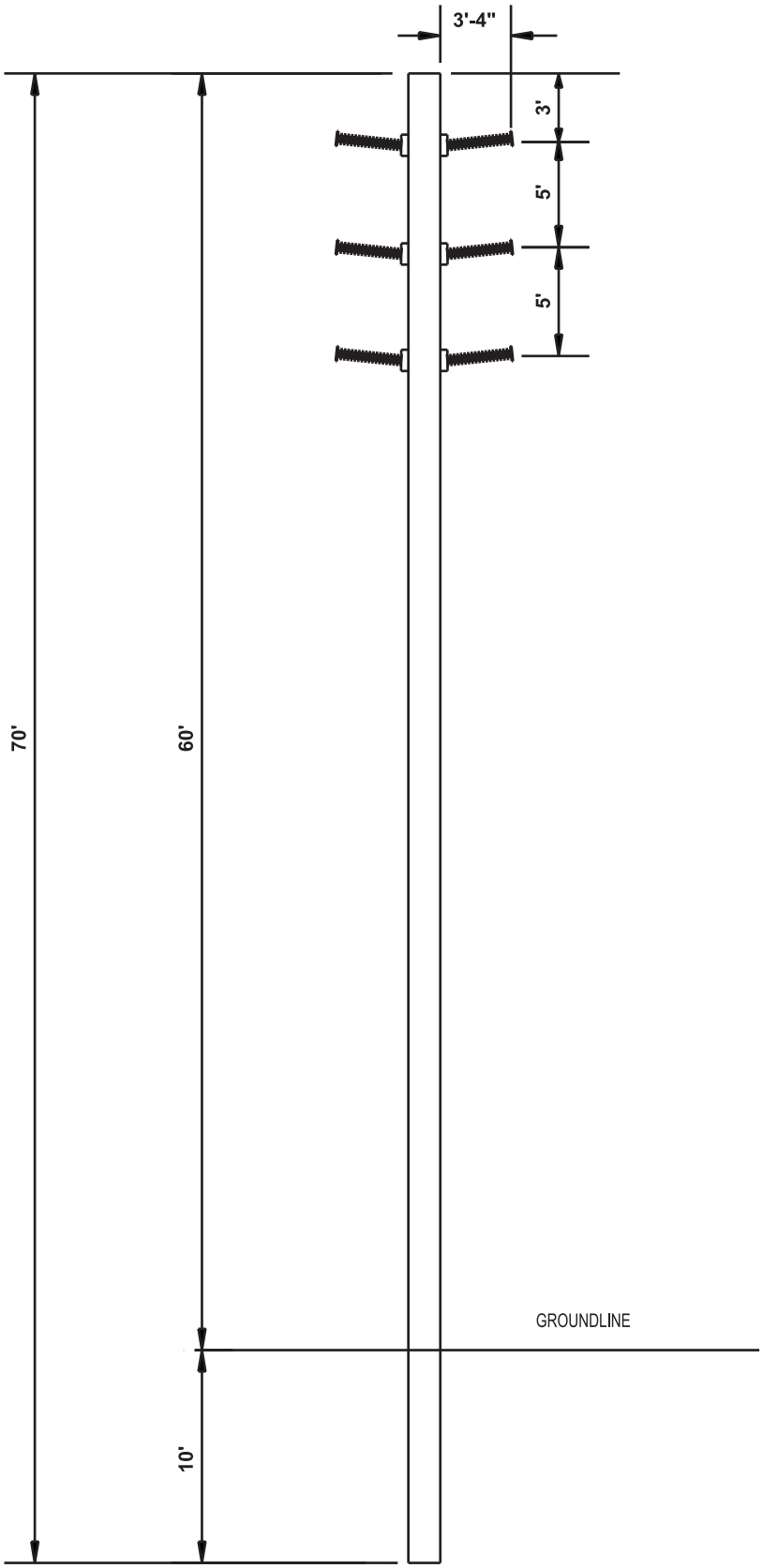
Figure 2.2-71
Typical 220-kV Double-Circuit 3-Pole Steel Dead-End



Source: SCE, 2007a.

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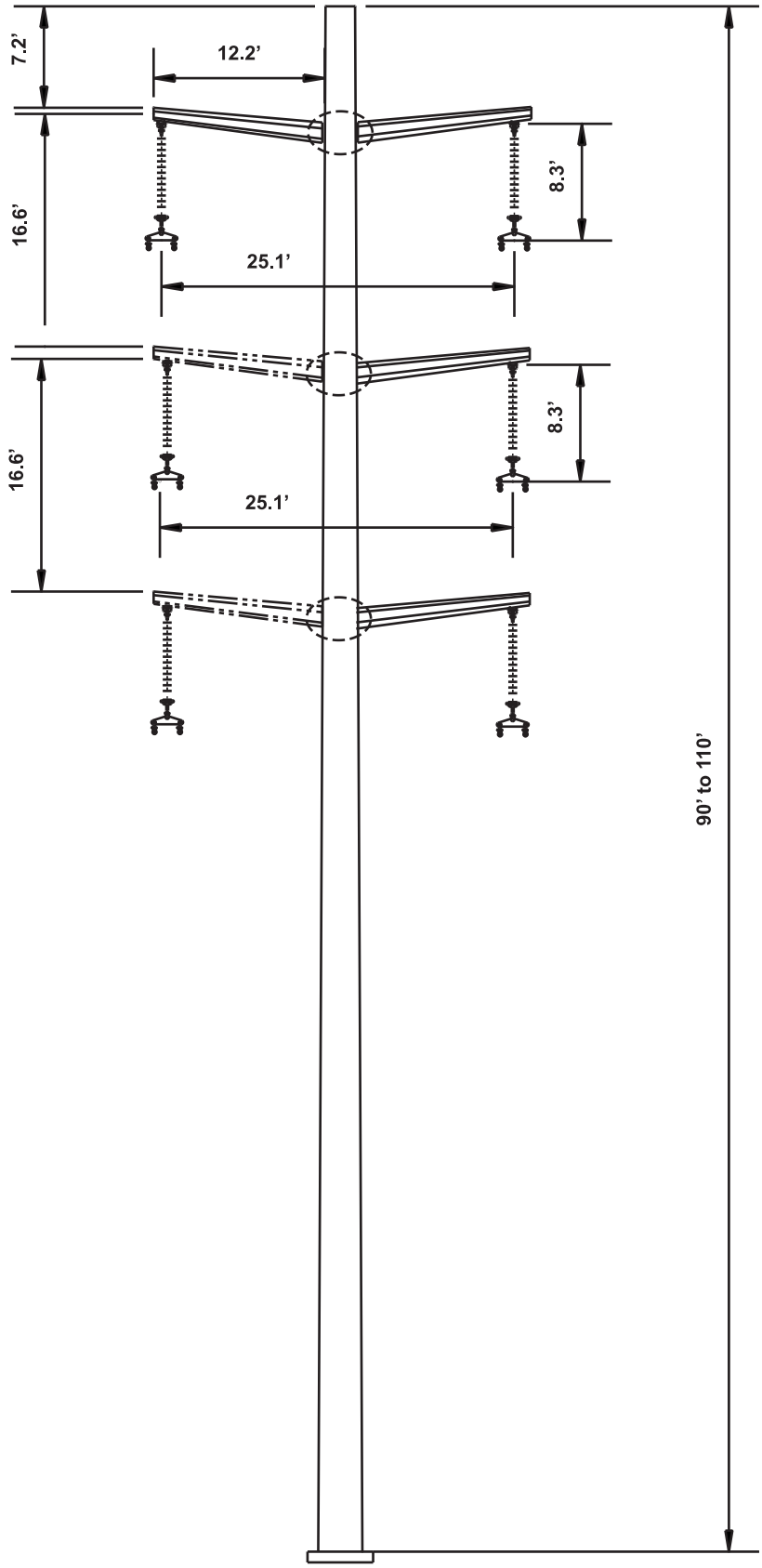
Figure 2.2-72
Typical 66-kV Light Weight Steel Pole



Source: SCE, 2007a.

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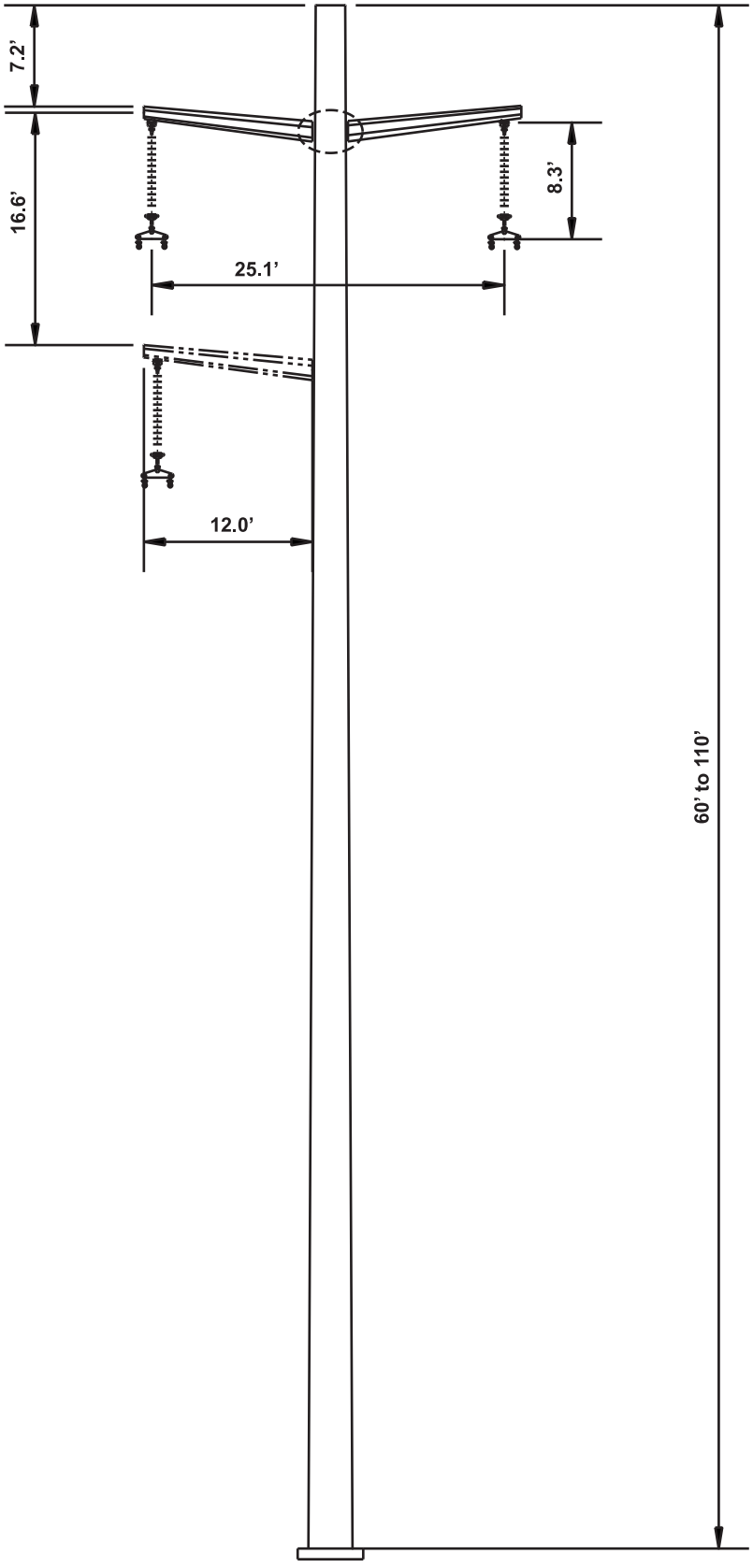
Figure 2.2-73
Typical 220-kV Double-Circuit Tubular Steel Pole



Source: SCE, 2007a.

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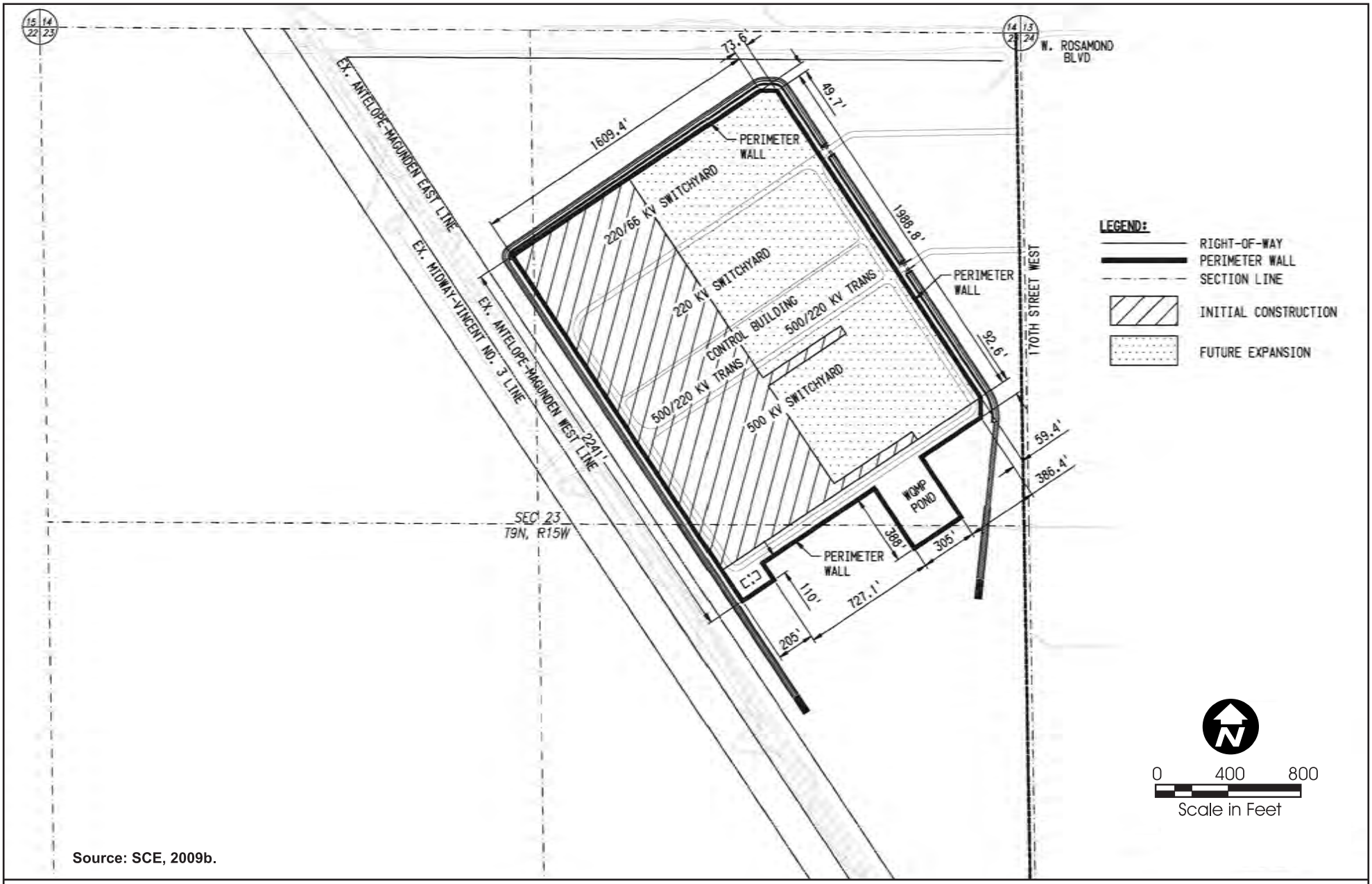
Figure 2.2-74
Typical 220-kV Single-Circuit Tubular Steel Pole



Source: SCE, 2009b.

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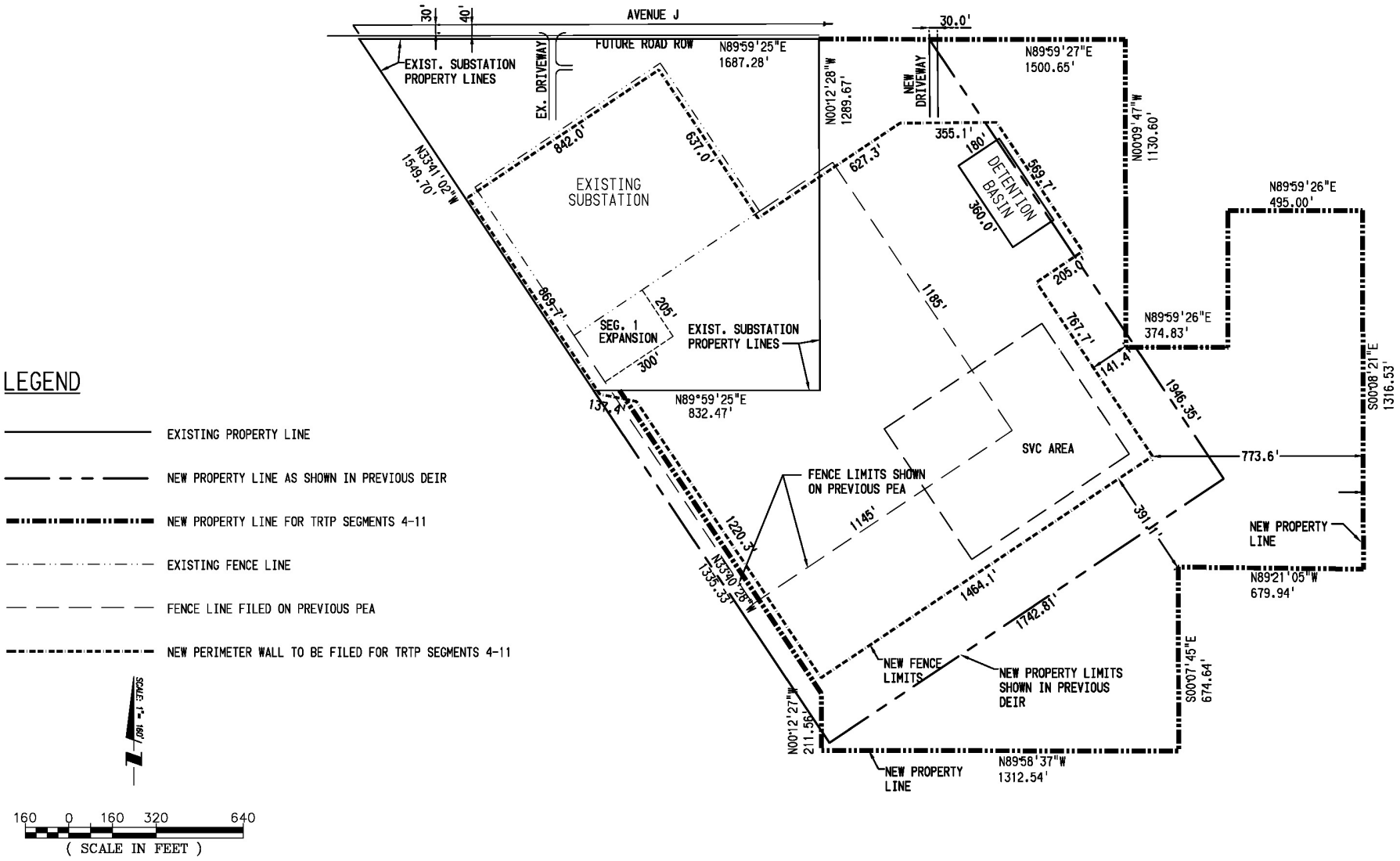
Figure 2.2-75 (Revised)

Proposed New Whirlwind Substation



Source: SCE, 2009d.

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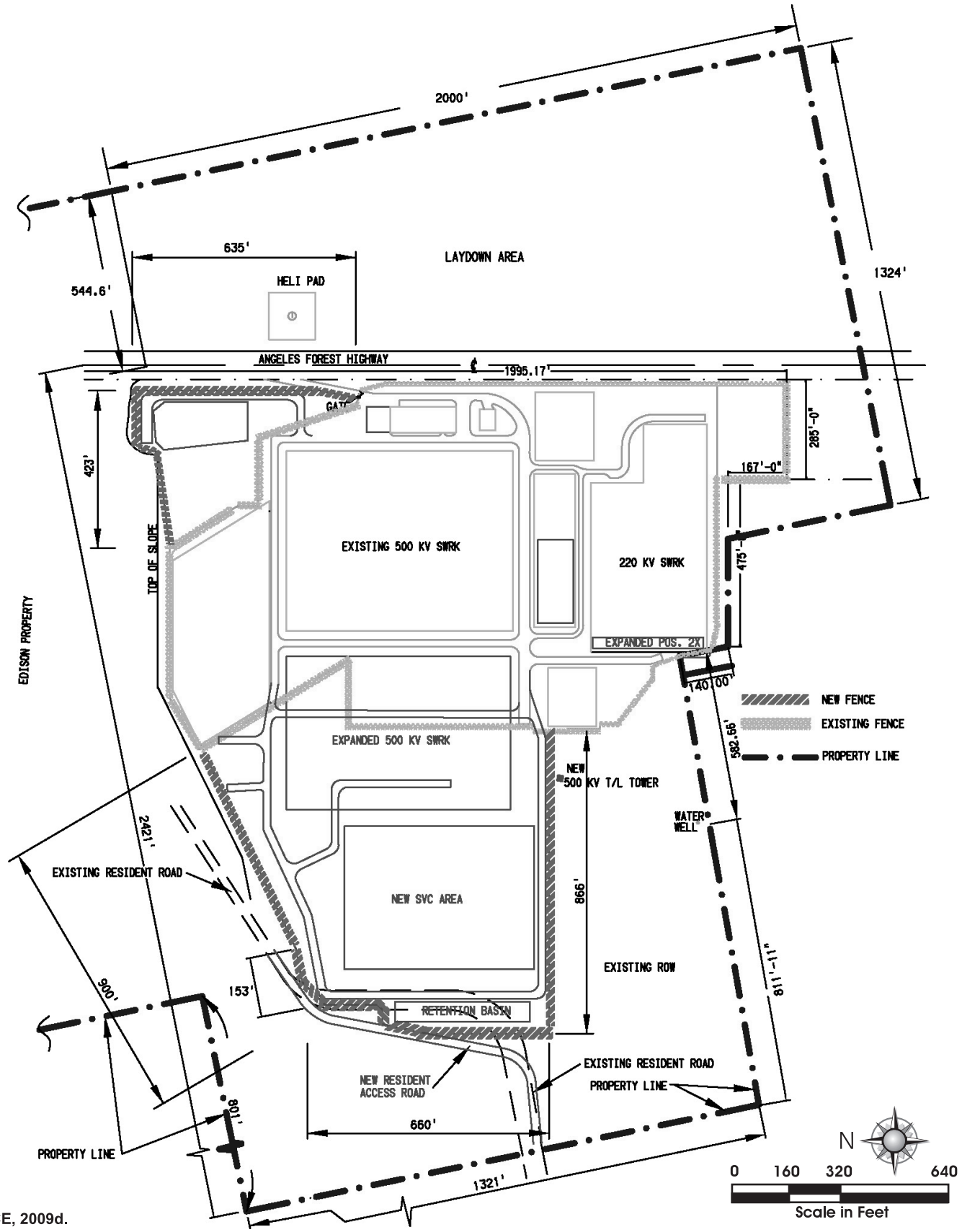
Figure 2.2-76 (Revised)

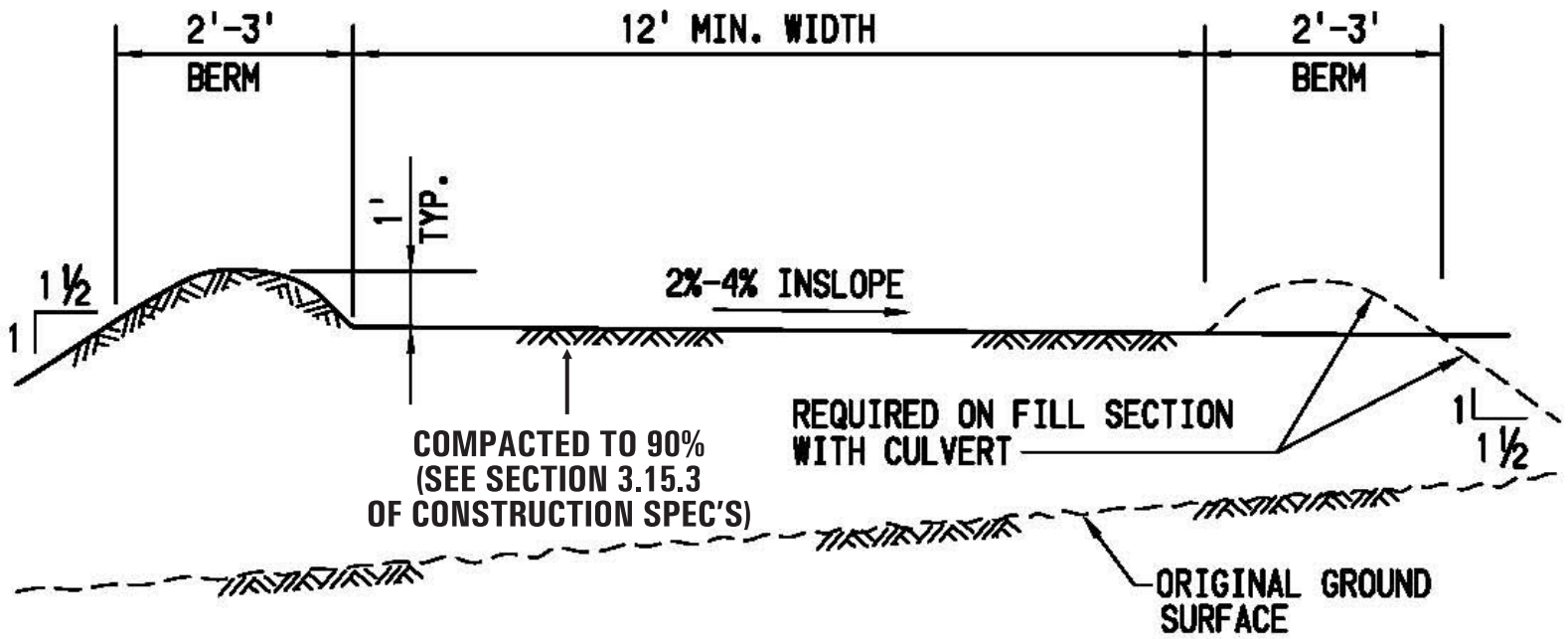
Proposed Upgrades to Antelope Substation



Source: SCE, 2009d.

Figure 2.2-77 (Revised)

Proposed Upgrades to Vincent Substation



TYPICAL FULL FILL SECTION
(40% MAX. EXISTING GROUND CROSS SLOPE)

Source: SCE, 2007a.

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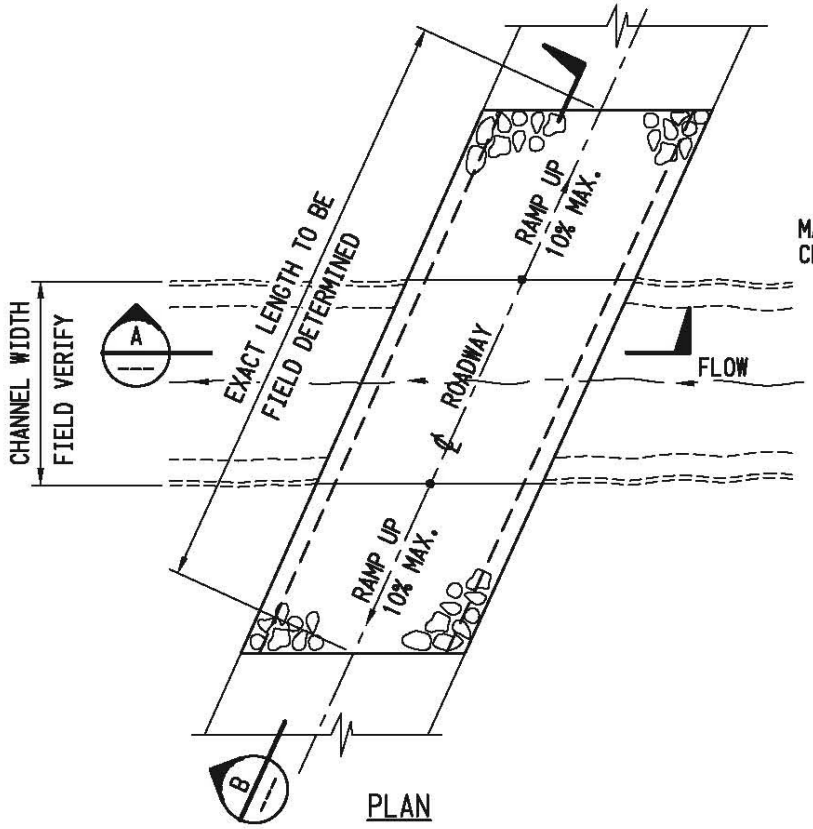
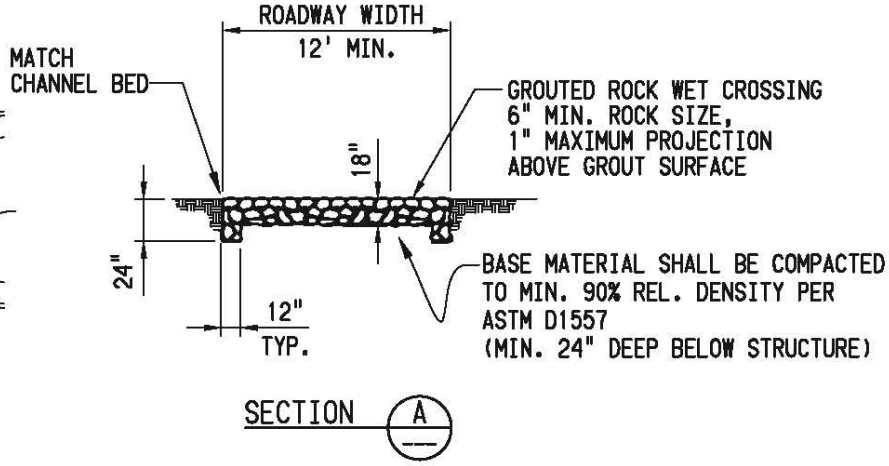
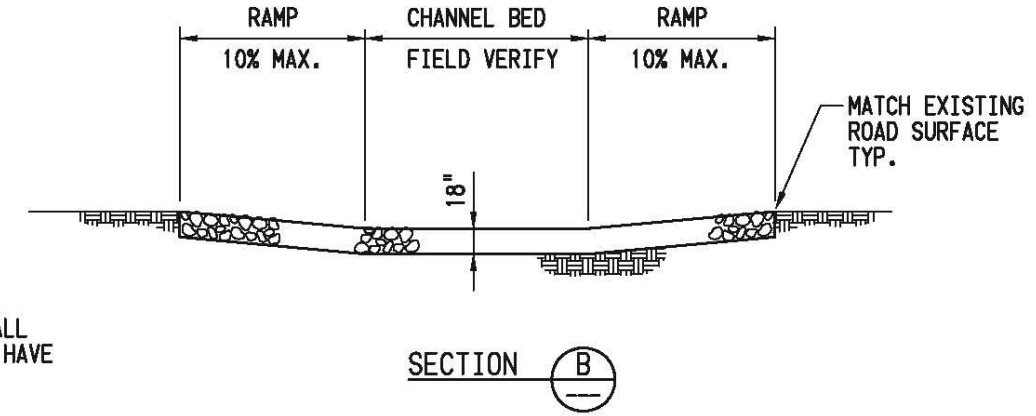
Figure 2.2-78 (Revised)
Typical Road Cross-Section (Full Cut with Bench)







NOTES:

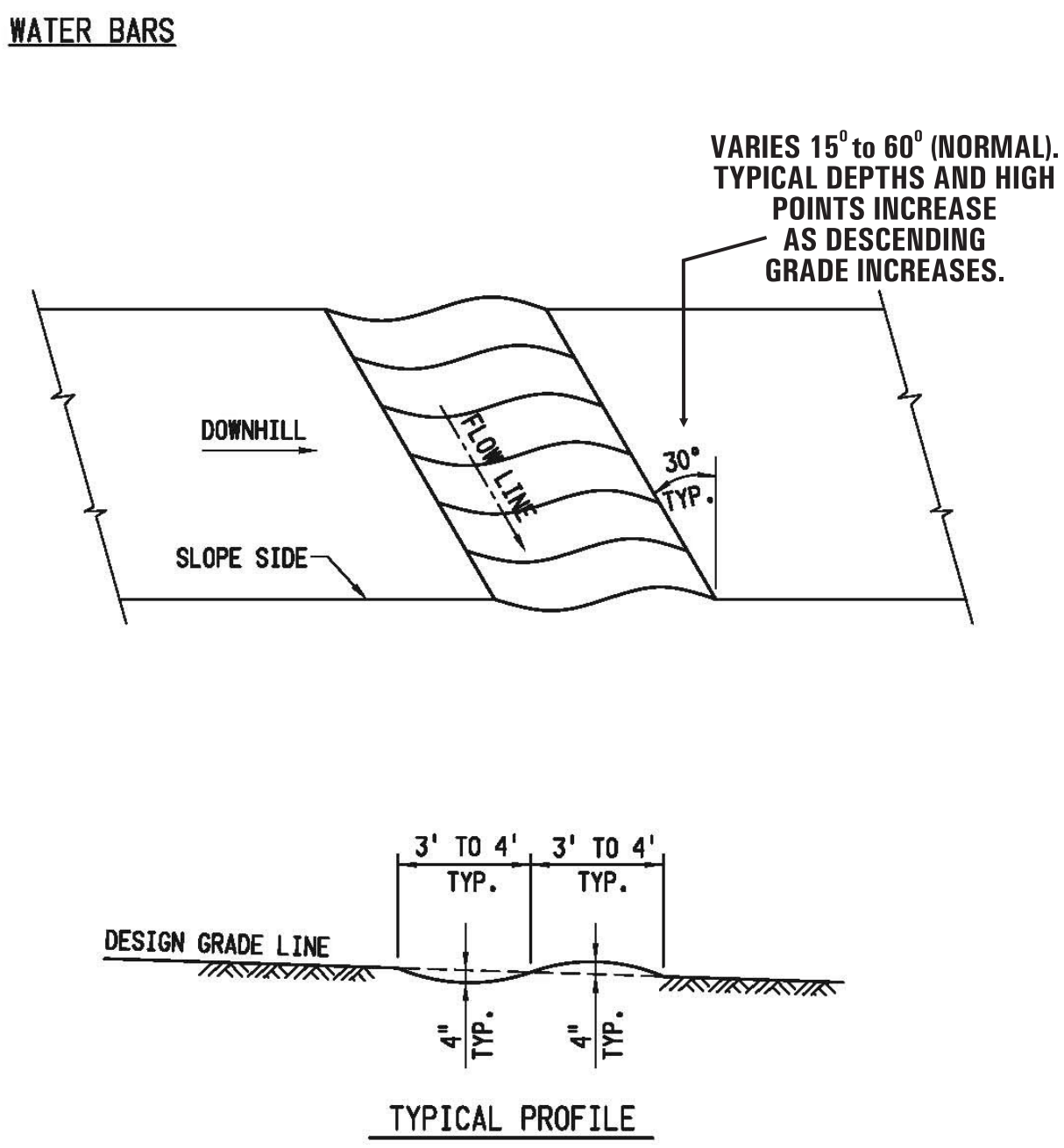
1. PORTLAND CEMENT USED FOR GROUT SHALL BE TYPE II PORTLAND CEMENT CONFORMING TO ASTM C-150.

2. ALL ROCKS SHALL BE HARD, DURABLE, AND NOT DISINTEGRATE OR SOFTEN WHEN EXPOSED TO WATER OR WEATHERING. ROCK USED FOR WET CROSSING SHALL BE SMOOTH AND WITHOUT SHARP EDGES, AND SHALL HAVE A MINIMUM SPECIFIC GRAVITY OF 2.5

Source: SCE, 2007a.

Figure 2.2-79

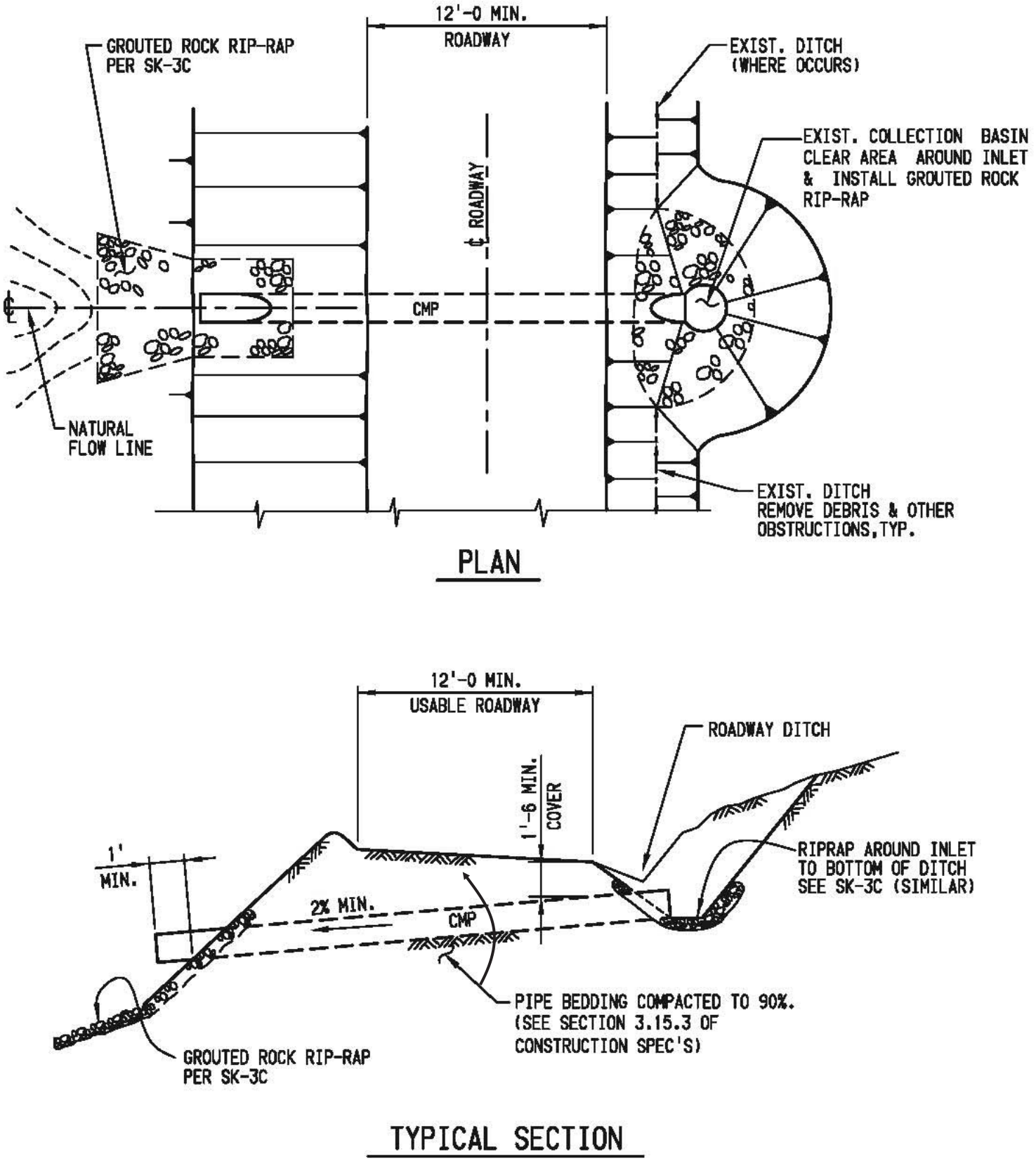
Grouted Rock Wet Crossing (Typical Installation)



Source: SCE, 2007a.

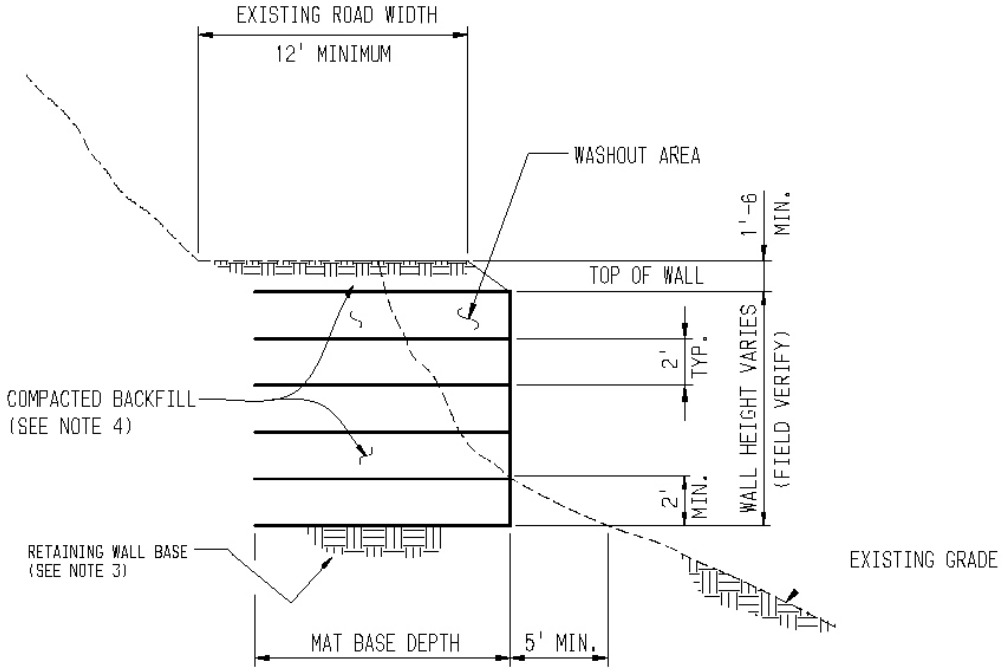
Figure 2.2-80 (Revised)

Overside Drains-
Water Bars



Source: SCE, 2007a.

Figure 2.2-81 (Revised)
Pipe Culvert Installation



TYPICAL SECTION

NOTES:

1. CONTRACTOR SHALL FIELD VERIFY EXACT DIMENSIONS (WALL HEIGHT AND LENGTH) FOR THE RETAINING WALL PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL MAKE HIS OWN ARRANGEMENT TO PURCHASE ALL WELDED WIRE MESH, REINFORCING MATS AND ALL OTHER WALL COMPONENTS FROM HILFIKER RETAINING WALL COMPANY:
   P.O. BOX 2012 EUREKA, CA 95502-2012
   TEL. NO. (707) 443-5093

2. CONSTRUCTION METHODS AND PROCEDURES SHALL CONFORM TO MANUFACTURER'S TECHNICAL SPECIFICATION AND THE EDISON GEOTECHNICAL REPORT FOR THE ANTELOPE TRANSMISSION PROJECT.

3. BASE FOR RETAINING WALL SHALL BE COMPACTED TO MINIMUM 95% RELATIVE DENSITY PER ASTM D1557. MOISTURE CONTENT DURING COMPACTION SHALL BE BROUGHT TO WITHIN 2% OF OPTIMUM MOISTURE CONTENT.

4. WALL BACKFILL SHALL BE PLACED IN LOOSE LIFTS OF 8" OR LESS AND COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY OBTAINED IN ACCORDANCE WITH ASTM D1557. THE MOISTURE CONTENT OF THE SOIL AT THE TIME OF COMPACTION SHALL BE WITHIN 2% OF THE OPTIMUM MOISTURE CONTENT.

5. FOR TYPICAL DETAILS AND CONSTRUCTION SEQUENCE, REFER TO MFR'S. SPECIFICATIONS.

6. THE CONTRACTOR SHALL PROVIDE DESIGN CALCULATIONS TO THE EDISON ENGINEER (FOR REVIEW AND APPROVAL) FOR EACH RETAINING WALL PRIOR TO CONSTRUCTION.

Source: SCE, 2007a.

Figure 2.2-82
Hilfiker Retaining Wall (Typical Section)

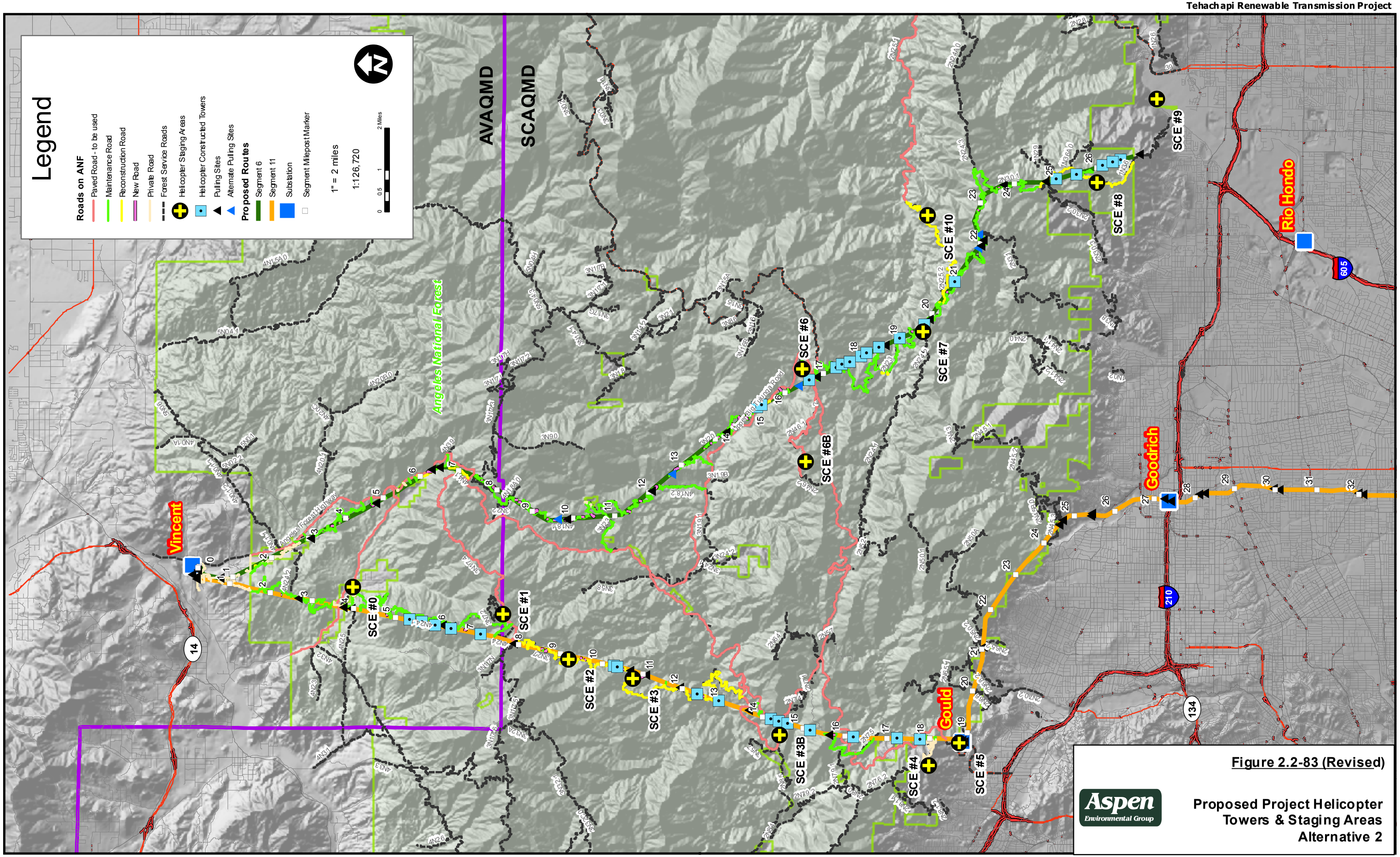


Figure 2.2-83 (Revised)

Proposed Project Helicopter Towers & Staging Areas Alternative 2

Source: SCE, 2007a.

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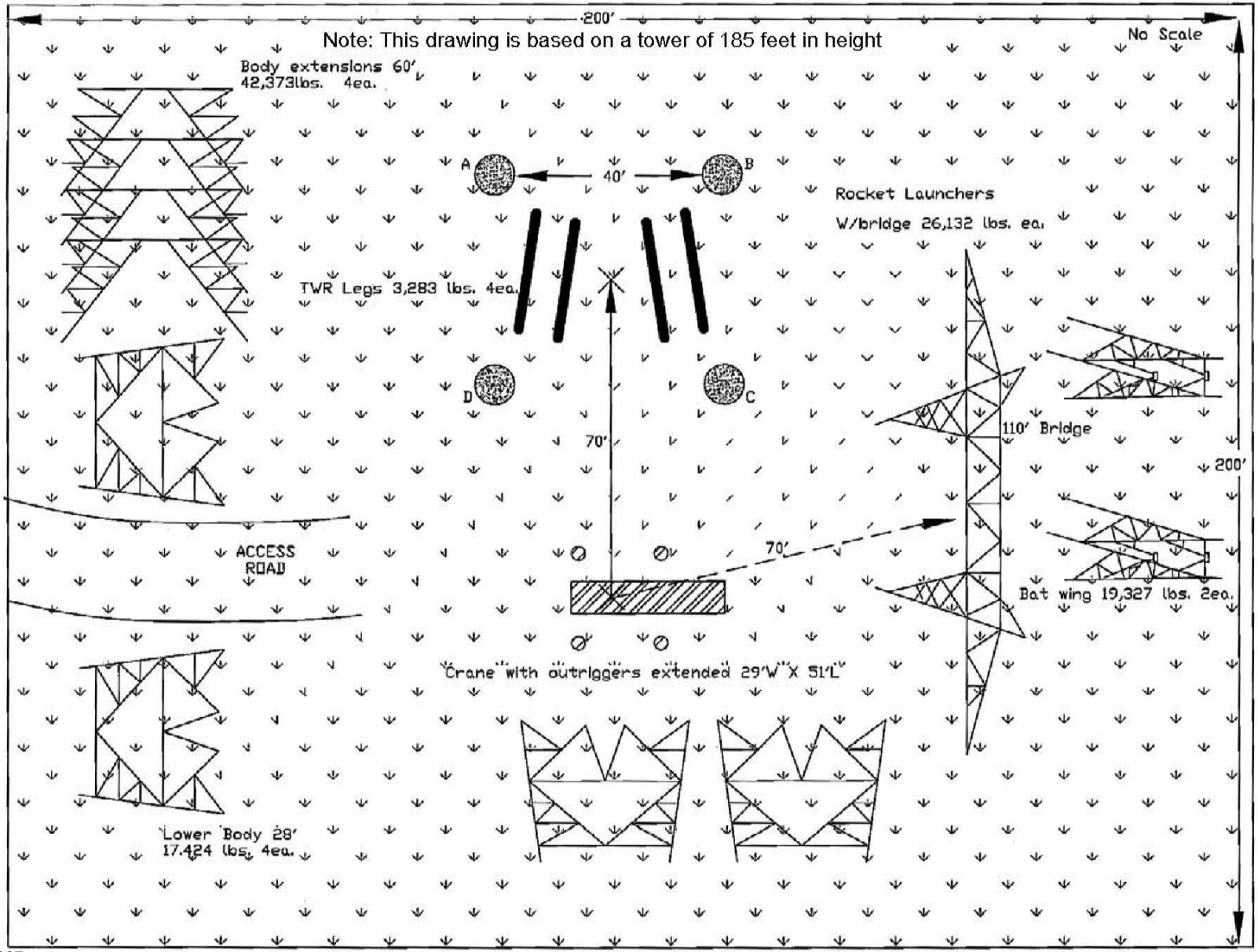
Figure 2.2-84
Helicopter Use for Lattice Steel Tower Erection



Source: SCE, 2007a.

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Figure 2.2-85

Typical Lattice Steel Tower Assembly Area

Source: SCE, 2007a.

Aspen Environmental Group

Figure 2.2-86
Typical Freeway Net System

Source: SCE, 2007a.

Aspen Environmental Group

Figure 2.2-87

Typical Guard Structure Railroad Crossing (H-Frame Configuration with Net)

Source: SCE, 2007a.

Aspen Environmental Group

Figure 2.2-88

**Typical Guard Structure
Low Voltage or Street Crossing**

ALTERNATIVE 2

(PROPOSED PROJECT)

TABLES

Table 2.2-1 is provided in Section 2.2.1 (Overview of Alternative 2), above.
All other tables are provided here.

Table 2.2-2. Proposed Project Estimate of Land Disturbance – Segment 10: New Whirlwind – Windhub 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Guard Pole Holes [1]	28	P/4(28"/12)**2x6 locs *1.5	0.012	0.012	0.00
Guard Pole Truck Disturbance [2]	28	2 tracksx10'x2'x6 locs	0.15	0.15	0.00
LST Footings Holes (qty LSTs) [3]	96	P/4*32* *4	0.06	0.00	0.06
LST Footings Truck Disturbance [4]	96	2 tracksx10'x2'x4 locs	0.35	0.35	0.00
LST Lay Down and Assembly Area [5]	96	175' X 60'	23.14	23.14	0.00
Crane pads for Tower Erection	96	50' X 50'	5.51	5.51	0.00
Pull Sites	16	200' X 400'	11.75	11.75	0.00
Roads, New Access	4.85	L X 16' wide	9.41	0.00	9.41
Roads, New Spur [6]	2.25	L X 30' wide	8.18	0.00	8.18
Roads, Existing (Impacted area of roads only)	8.25	L X 6' wide	6.00	0.00	6.00
Spur Road Related Temporary Disturbance [7]	96	566 ft^2 per spur road	1.25	1.25	0.00
Staging Areas, Material and Equipment	5	3-5 acres/yard	25.00	25.00	0.00
Total Estimated			90.81	67.16	23.65
LAND DISTURBANCE RANGE (±15%)			77.2 - 104.4		20.6 - 27.8

Source: SCE, 2007a – PEA Table 3.3-7 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Guard pole-assume two guard poles per each side of street thus 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 20% more crossings present.

2 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

3 LST-assume 54" dia x 20' depth with overbore for concrete backfill based on conventional footing construction.

4 LST-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to four locations per LST approx. 20" from stub road.

5 LST structure layout, assembly and erection dimensions vary from dimensions shown due to quantity of structures to be worked on located within immediate vicinity.

6 Spur road is required when access road is over 50' from structure site.

7 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2).

Table 2.2-3. Proposed Project Estimate of Land Disturbance – Segment 4: Cottonwind – Whirlwind 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Guard Structures	4	100' X 200'	1.84	1.84	0.00
Tower Sites (Includes Tower wreck-out, Foundation Installation, Tower Assembly and Erection, Wire Installation)	88	200' X 200'	80.81	60.61	20.20
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	0	(150' X 150')/2	0.00	0.00	0.00
Abandonment of Existing Spur Roads (To Tower Wreck-out Sites Only)	0	20' X 200'	0.00	0.00	(5.88)
Stringing Setup Areas (Puller)	14	200' X 200'	12.86	12.86	0.00
Stringing Setup Areas (Tensioner)	14	200' X 500'	32.14	32.14	0.00
Splicing Setup Areas	2	150' X 100'	0.69	0.69	0.00
Roads, New Access	0		0.00	0.00	0.00
Roads, New Spur	2.86		6.57	5.91	0.66
Roads, Existing (Impacted area of roads only)	14.66	5280 X 2	3.55	0.00	3.55
Radius From Access Road to Spur Road	88	50' Radius=1464 sq'	2.96	0.00	2.96
Staging Areas, Material and Equipment	1	10 acres	10.00	10.00	0.00
Total Estimated			151.41	124.04	21.49
LAND DISTURBANCE RANGE (±15%)			128.7 – 174.1		18.3 - 24.7

Source: SCE, 2007a – PEA Table 3.3-1 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range. Calculations assume conventional footing construction.

Table 2.2-4. Proposed Project Estimate of Land Disturbance – Segment 4: ~~Antelope~~Vincent~~ –~~ – Whirlwind 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Guard Structures	4	100' X 200'	1.84	1.84	0.00
Tower Sites (Includes Tower wreck-out, Foundation Installation, Tower Assembly and Erection – including crane pads, Wire Installation)	77	200' X 200'	70.71	53.03	17.68
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	2	(150' X 150')/2	0.52	0.52	0.00
Abandonment of Existing Spur Roads (To Tower Wreck-out Sites Only)	2	20' X 200'	0.00	0.18	(5.88)
Stringing Setup Areas (Puller)	20	200' X 200'	18.37	18.37	0.00
Stringing Setup Areas (Tensioner)	20	200' X 500'	45.91	45.91	0.00
Splicing Setup Areas	5	150' X 100'	1.72	1.72	0.00
Roads, New Access	0		0.00	0.00	0.00
Roads, New Spur	4.33		9.94	8.95	0.99
Roads, Existing (Impacted area of roads only)	18.44	5280 X 2	4.47	0.00	4.47
Radius From Access Road to Spur Road	77	50' Radius=1464 sq'	2.59	0.00	2.59
Staging Areas, Material and Equipment	1	10 acres	10.00	10.00	0.00
Total Estimated			166.06	140.52	19.85
LAND DISTURBANCE RANGE (±15%)			141.2 – 191.0		16.9 – 22.8

Source: SCE, 2007a – PEA Table 3.3-2 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range. Calculations assume conventional footing construction.

Table 2.2-5. Proposed Project Estimate of Land Disturbance – Segment 5: Antelope – Vincent No. 2 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Tower Sites (Includes Tower wreck-out, Foundation Installation, Tower Assembly and Erection – including crane pads, Wire Installation)	63	200' X 200'	57.85	43.39	14.46
Tower Sites (Tower wreck-out only) (Newly disturbed area only) [1]	64	(150' X 150')/2	16.53	16.53	0.00
Abandonment of Existing Spur Roads (To Tower Wreck-out Sites Only)	64	20' X 200'	0.00	5.88	(5.88)
Stringing Setup Areas (Puller)	14	200' X 200'	12.86	12.86	0.00
Stringing Setup Areas (Tensioner)	16	200' X 500'	35.58	35.58	0.00
Splicing Setup Areas	7	150' X 100'	2.41	2.41	0.00
Roads, New Access [2]	0		0.00	0.00	0.00
Roads, New Spur [3]	0		0.00	0.00	0.00
Roads, Existing (Impacted area of roads only)	5.5	5280 X 2	1.33	0.00	1.33
Radius From Access Road to Spur Road,	51	50' Radius=1464 sq'	1.71	0.00	1.71
Staging Areas, Material and Equipment	2	10 acres	20.00	20.00	0.00
Total Estimated			148.27	136.65	11.62
LAND DISTURBANCE RANGE (±15%)			126.0 - 170.5		9.9 - 13.4

Source: SCE, 2007a – PEA Table 3.3-3 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range. Calculations assume conventional footing construction.

1 Previously disturbed portions of existing 220 kV tower site locations that were left as permanent disturbance were not counted as construction disturbance in this calculation.

2 The road disturbance quantities are based on the premise that Antelope-Vincent 500 kV Transmission Line Segment 2 would be completed prior to the commencement of construction of Segment 5. Segment 5 would benefit from the main access road improvements completed for Segment 2.

3 Spur roads to and tower site landing at existing 220 kV tower sites that are not designated as new 500 kV tower sites would be restored and abandoned.

Table 2.2-6. Proposed Project Estimate of Land Disturbance – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Gould – Vincent 500-kV T/L (NFS Lands)					
Towers Constructed by Helicopter	16				
Guard Structures (Qty = Pair)	8	2 X 50' x 150'	2.75	2.75	0.00
Tower Sites (Includes Tower wreck-out, Foundation Installation, Tower Assembly and Erection – including crane pads, Wire Installation) [5]	59	200' X 200'	49.37	35.83	13.54
Tower Sites (Tower wreck-out only) [1] (Newly disturbed area only)	3	(100' X100')/2	0.34	0.34	0.00
Abandonment Of Existing Spur Roads [2] (Qty in Feet - To Tower Wreck-out Sites Only)	80	0	0.00	0.02	0.00
Wire Stringing Areas (puller/tensioner/splicing) [9] (qty setups)	10	150' X 300'	10.33	10.33	0.00
Roads, New Access/Spur (qty miles) [3]	1.31~~5~~	L X 16' wide	2.55~~62~~	0.00	2.55~~62~~
Roads, Reconstruction (qty miles) [3]	13.31	L X 16' wide	25.81	0.00	25.81
Roads, Maintenance (qty miles) [3] (Impacted area of roads only)	18.03~~17~~	L X 5' wide	10.93~~11.01~~	0.00	10.93~~11.01~~

Table 2.2-6. Proposed Project Estimate of Land Disturbance – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Radius From Access Road to Spur Road [6]	42	50' radius=1464sq'	1.42	0.00	1.42
Staging Areas, Material and Equipment [4]	1	10 acres	10.00	10.00	0.00
Helicopter Staging/Support Areas [10]	4	4 acres (avg.)	16.00	16.00	0.00
Landing Pads [7]	16	40' X 40'	0.588	0.147~~0.588~~	0.441~~0.00~~
Support Yards [8]	8	100' X 100'	1.84	1.84	0.00
Total Estimated			131.93~~132.08~~	77.24~~68~~	54.69~~40~~
LAND DISTURBANCE RANGE (±15%)			112.1 – 151.7 ~~112.3 – 151.9~~		46.5 – 62.9 ~~46.2 – 62.6~~
New Structure Foundations – Spoils	244	Qty X 5' Dia X 35' Deep = Cu Yd	6,100.0	0.00	Hauled Away
Gould – Vincent 500-kV T/L (Non-NFS Lands)					
Towers Constructed by Helicopter	0				
Guard Structures (Qty = Pair)	5	2 X 50' X 150'	1.72	1.72	0.00
Tower Sites (Includes Tower wreck-out, Foundation Installation, Tower Assembly and Erection – including crane pads, Wire Installation)[5]	8	200' X 200'	7.34	5.50	1.84
Tower Sites (Tower wreck-out only) [1] (Newly disturbed area only)	1	(100' X100')/2	0.26	0.26	0.00
Abandonment Of Existing Spur Roads [2] (Qty in Feet - To Tower Wreck-out Sites)	0		0.00	0.00	0.00
Wire Stringing Areas (puller/tensioner/splicing) [9] (qty setups)	6	Note 9	13.43	13.43	0.00
Roads, New Access/Spur (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Reconstruction (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Private/Maintenance (qty miles) [3] (Impacted area of roads only)	7.02~~27~~	L X 5' wide	4.25~~38~~	0.00	4.25~~38~~
Radius From Access Road to Spur Road [6]	7	50' radius=1464sq'	0.24	0.00	0.24
Staging Areas, Material and Equipment [4]	4	10 ~~9.5~~ acres	40.00	40.00	0.00
Helicopter Staging/Support Areas [10]	3	4 acres (avg.)	12.00	12.00	0.00
Landing Pads [7]	0	40' X 40'	0.00	0.00	0.00
Support Yards [8]	6	100' X 100'	1.38	0.23~~1.38~~	1.15~~0.00~~
Total Estimated			80.62~~75~~	73.14~~74.29~~	7.48~~6.46~~
LAND DISTURBANCE RANGE (±15%)			68.5 – 92.7 ~~68.6 – 92.9~~		6.4 – 8.6 ~~5.5 – 7.4~~
New Structure Foundations – Spoils	36	Qty X 5' Dia X 35' Deep = Cu Yd	900.0	0.00	Hauled Away
Gould-Mesa 220-kV T/L (NFS Lands)					
Guard Structures (Qty = Pair)	4	2 X 50' X 100'	2.75	2.75	0.00
~~Lattice Tower Sites for Mesa - Vincent 220 kV T/L at Gould Sub. (Includes Foundation Installation, Tower Assembly and Erection - Wire Installation)~~	~~5~~	~~200' X 200'~~	~~4.59~~	~~4.13~~	~~0.46~~
~~Structure Sites for Eagle Rock - Gould 220 kV T/L at Gould Sub. (Includes Foundation Installation, Tower Assembly and Erection - iWire Installation)~~	~~5~~	~~160' X 200'~~	~~3.67~~	~~3.31~~	~~0.37~~
Wire Stringing Areas (puller/tensioner/splicing) [9] (qty setups)	1	150' X 300'	1.03	1.03	0.00
Roads, New Access/Spur (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Reconstruction (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Maintenance (qty miles) [3] (Impacted area of roads only)	0	L X 5' wide	0.00	0.00	0.00

Table 2.2-6. Proposed Project Estimate of Land Disturbance – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Radius From Access Road to Spur Road	0	50' radius=1464sq'	0.00	0.00	0.00
Staging Areas, Material and Equipment	0	10 acres	0.00	0.00	0.00
Total Estimated			3.78~~12.04~~	3.78~~11.21~~	0.00~~0.83~~
LAND DISTURBANCE RANGE (±15%)			3.2 – 4.3 ~~10.2 – 13.8~~		0.00 ~~0.7 – 1.0~~
~~New Structure Foundations - Spoils on Mesa - Vincent 220 kV T/L at Gould Sub.~~	~~5~~	~~Qty X 120 Cu Yd~~	~~600.0~~	~~0.00~~	~~Hauled Away~~
~~New Structure Foundations - Spoils on Gould – Eagle Rock 220 kV T/L at Gould Sub.~~	~~5~~	~~Qty X 120 Cu Yd~~	~~600.0~~	~~0.00~~	~~Hauled Away~~
Gould-Mesa 220-kV T/L (Non-NFS Lands)					
Guard Structures (Qty = Pair)	57	2 X 50' X 100'	13.09	13.09	0.00
Tower Sites (Wire Installation Only)	68	No Disturbance	0.00	0.00	0.00
Tower Sites - # 104 (Includes Foundation Installation, Tower Assembly and Erection – including crane pads, Wire Installation)	1	200' X 200'	0.92	0.87	0.05
Lattice Tower Sites for Mesa - Vincent 220 kV T/L at Gould Sub. (Includes Foundation Installation, Tower Assembly and Erection –Wire Installation)	5	200' X 200'	4.59	4.13	0.46
Structure Sites for Eagle Rock - Gould 220 kV T/L at Gould Sub. (Includes Foundation Installation, Tower Assembly and Erection – iWire Installation)	5	160' X 200'	3.67	3.31	0.37
Wire Stringing Areas (puller/tensioner/splicing) [9] (qty setups)	19	150' X 300'	19.63	19.63	0.00
Roads, New Access/Spur (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Reconstruction (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Private/Maintenance (qty miles) [3] (Impacted area of roads only)	0	L X 5' wide	0.00	0.00	0.00
Radius From Access Road to Spur Road	0	50' radius=1464sq'	0.00	0.00	0.00
Staging Areas, Material and Equipment	0	10 acres	0.00	0.00	0.00
Total Estimated			41.90~~33.64~~	41.03~~33.59~~	0.88~~0.05~~
LAND DISTURBANCE RANGE (±15%)			35.6 – 48.2 ~~28.6 – 38.7~~		0.7 – 1.0 ~~0.0 – 0.1~~
New Structure Foundations – Spoils #104	4	Qty X 5' Dia X 35' Deep = Cu Yd	100.0	0.00	Hauled Away
New Structure Foundations - Spoils on Mesa - Vincent 220 kV T/L at Gould Sub.	5	Qty X 120 Cu Yd	600.0	0.00	Hauled Away
New Structure Foundations - Spoils on Gould – Eagle Rock 220 kV T/L at Gould Sub.	5	Qty X 120 Cu Yd	600.0	0.00	Hauled Away

Source: SCE, 2007a – PEA Table 3.3-8 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range. Calculations assume conventional footing construction.

1 Previously disturbed portions of existing 220 kV tower site locations that were left as permanent disturbance were not counted as construction disturbance in this calculation.

2 Spur roads to and tower site landing at existing 220 kV tower sites that are not designated as new 500 kV tower sites would be restored and abandoned.

3 Definitions of road categories (maintenance, reconstruction, and new) are provided in Section 3.13 (Traffic and Transportation). Access roads and spur roads would be stabilized for drainage at the end of construction and left serviceable for the maintenance of the power line. Common access roads near Vincent Substation (Private – Non-NFS) have been included as part of Segment 11.

4 Assume material and equipment distributed along the ROW as the work progresses.

5 For helicopter constructed towers, disturbance would not include assembly & erection areas or crane pads (Assume 0.24 acres per laydown/assembly area per Segment 6 [32.5acres/135 structures] and 0.06 acres per crane pad [50'x50'] per Segment 6 = Total reduction of 0.3 acres per heli tower).

Area of permanent disturbance does not change. Land disturbance assumes conventional construction techniques for new footing installation; however, micropiles may be utilized where appropriate, feasible, and/or cost effective.

6 The number of total spur roads is assumed to be proportional to the quantity of structures constructed utilizing ground-based operations ratioed from the PEA, where 61 structures are constructed utilizing ground-based operations resulting in 60 total spurs.

7 Assume typical landing pad (40'x40') for every tower constructed by helicopter, of which 75 percent would be considered permanent to support operations and maintenance activities.

8 Assume 2 small support yards for personnel drop-off/pick-up, emergency landing, etc. per large helicopter staging/support area.

9 Assume average wire stringing site area of 150'x300' per GIS data; which is more conservative than the average size of 200'x200' presented in Section 2.2.12.7. ~~except for one site located off NFS lands near Vincent Substation, which is estimated to be approximately 1,200'x300'.~~

10 Average helicopter staging/support area of 4 acres assumed for most staging areas, although the size could range substantially depending on land available and intended use.

Table 2.2-7. Proposed Project Estimate of Land Disturbance – Segment 6: Rio Hondo – Vincent No. 2 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Rio Hondo – Vincent No. 2 500-kV T/L (NFS lands)					
Towers Constructed by Helicopter	17				
Guard Pole Hole [1] (qty street crossings on quad maps)	2	P/4(28"/12)**2x6 locs *1.2	0.002	0.002	0.00
Guard Pole Truck Disturbance [2] (same above)	2	2 tracks x10'x2'x6 locs	0.011	0.011	0.00
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	8	(150' X 150')/2	2.07	2.07	0.00
TSP Foundation Holes [3] (qty TSP)	6	=PI()*((108"/2)^2)	0.007	0.00	0.007
TSP Pole Hole Truck Disturbance [4] (same above)	6	2 tracks x20'x2'	0.011	0.011	0.00
LST Footing Holes [5] (qty LST)	99	=PI()*((54"/2)^2)	0.029	0.00	0.029
LST Footings Truck Disturbance [6] (same above)	82	2 tracks x20'x2'x4 locs	0.599	0.599	0.00
LST and TSP Laydown and Assembly Area [7] (varies)	88	See note 7	21.21	21.21	0.00
Crane Pad for Erection (qty structures)	88	50' X 50'	5.05	5.05	0.00
Wire Stringing Areas (pulling/tensioning/splicing)[11.12] (qty setups)	16	See note 11	13.99	13.99	0.00
Roads, New Access/Spur (qty miles) [10]	3.06~~2.85~~	L X 16' wide	5.93~~52~~	0.00	5.93~~52~~
Roads, Reconstruction (qty miles) [10]	9.99~~67~~	L X 16' wide	19.38~~18.75~~	0.00	19.38~~18.75~~
Roads, Maintenance (qty miles) [10] (impacted area of roads only)	44.25~~45.6~~	L X 5' wide	26.82~~27.64~~	0.00	26.82~~27.64~~
Radius from access road to spur road (# Spur Roads Total) [13]	48	50' R requires 1464 sq. ft.	1.61	0.00	1.61
Spur Rd Related Temp Disturbed Areas[8]	64	566 sq. ft per spur road	0.823	0.823	0.00
Additional Spur Rd Radius for TSP and LST haul Trucks [9]	32	2285 sq. ft. per spur road	1.671	1.671	0.00
Staging Areas for Materials and Equipment	2	3-5 acres per yard	10.00	10.00	0.00
Helicopter Staging/Support Areas [16]	5~~4~~	4 acres (avg.)	21.85~~16.00~~	21.85~~16.00~~	0.00
Landing Pads [14]	17	40' X 40'	0.624	0.147~~0.624~~	0.477~~0.00~~
Support Yards [15]	10~~8~~	100' X 100'	2.296~~1.837~~	2.296~~1.837~~	0.00
Total Estimated			133.99~~127.46~~	79.73~~73.90~~	54.26~~53.56~~
LAND DISTURBANCE RANGE (±15%)			113.9 – 154.1 ~~108.3 – 146.6~~		46.1 – 62.4 ~~45.5 – 61.6~~
Rio Hondo – Vincent No. 2 500-kV T/L (Non-NFS lands)					
Towers Constructed by Helicopter	0				
Guard Pole Hole [1] (qty street crossings on quad maps)	1	P/4(28"/12)**2x6 locs *1.2	0.001	0.001	0.00

Table 2.2-7. Proposed Project Estimate of Land Disturbance – Segment 6: Rio Hondo – Vincent No. 2 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Guard Pole Truck Disturbance [2] (same above)	1	2 tracks x10'x2'x6 locs	0.006	0.006	0.00
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	6	(150' X 150')/2	1.55	1.55	0.00
TSP Foundation Holes [3] (qty TSP)	24	=PI()*((108"/2)^2)	0.028	0.00	0.028
TSP Pole Hole Truck Disturbance[4] (same above)	24	2 tracks x20'x2'	0.044	0.044	0.00
LST Footing Holes [5] (qty LST)	9	=PI()*((54"/2)^2)	0.003	0.00	0.003
LST Footings Truck Disturbance [6] (same above)	9	2 tracks x20'x2'x4 locs	0.066	0.066	0.00
LST and TSP Laydown and Assembly Area [7] (varies)	33	See note 7	7.95	7.95	0.00
Crane Pad for Erection (qty structures)	33	50' X 50'	1.89	1.89	0.00
Wire Stringing Areas (pulling/tensioning/splicing) [11.12] (qty setups) <overlap demolition/new>	3	150' X 300'	3.10	3.10	0.00
Roads, New Access/Spur (qty miles) [10]	0	L X 16' wide	0.00	0.00	0.00
Roads, Reconstruction (qty miles) [10]	0.17	L X 16' wide	0.330	0.00	0.330
Roads, Maintenance (qty miles) [10] (impacted areas of roads only)	0.06	L X 5' wide	0.038	0.00	0.038
Roads, Private (qty miles) [10] (impacted areas of roads only)	2.423	L X 5' wide	1.47	0.00	1.47
Radius from access road to spur road (# Spur Roads Total) [13]	18	50' R requires 1464 sq. ft.	0.603	0.00	0.603
Spur Rd Related Temp Disturbed Areas[8]	24	566 sq. ft per spur road	0.308	0.308	0.00
Additional Spur Rd Radius for TSP and LST haul Trucks [9]	12	2285 sq. ft. per spur road	0.627	0.627	0.00
Staging Areas for Materials and Equipment	2	3-5 acres per yard	10.00	10.00	0.00
Helicopter Staging/Support Areas [16]	1	4 acres (avg.)	4.00	4.00	0.00
Landing Pads [14]	0	40' X 40'	0.00	0.00	0.00
Support Yards [15]	2	100' X 100'	0.459	0.459	0.00
Total Estimated			32.48	30.01	2.47
LAND DISTURBANCE RANGE (±15%)			27.6 – 37.4		2.1 – 2.9

Source: SCE, 2007a – PEA Table 3.3-4; SCE, 2007f – DR#4 Q4-01 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Guard pole-assume two guard poles per each side of street thus 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 50% more crossings present (1.5 multiplier) due to preliminary engineering undercrossings not showing mapped distribution, dirt roads and jeep trails.

2 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

3 TSP-assume 96" dia x 35' depth with overbore for concrete backfill based on conventional footing construction.

4 TSP-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to one locations per TSP approx. 20" from stub road.

5 LST-assume 42" dia x20' depth with overbore for concrete backfill based on conventional footing construction.

6 LST-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to four locations per LST approx. 20" from stub road. Total number is reduced by the number of towers to be constructed by helicopter.

7 LST and TSP structure layout, assembly and erection dimensions vary due to quantity of structures to be worked on located within immediate vicinity =(150*150*99)+(200*200*13)+(250*300*2)+(200*250)+(250*250)+(150*250)+(150*300). Total area from PEA (32.54 acres) based on ground-based construction of 135 structures. Ratioed acreage based on reduced number of ground-based constructed structures.

8 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2). Assume spur road temporary disturbance is proportional to the quantity of structures constructed utilizing ground-based operations.

9 Difference between 80' radius and 80' radius from access to spur road for access by 80' trailer bed truck. Assume additional spur road radius for TSP & LST Haul Trucks is proportional to the quantity of structures constructed utilizing ground-based operations.

10 Definitions of road categories (maintenance, reconstruction, and new) are provided in Section 3.13 (Traffic and Transportation). Common access roads near Vincent Substation (Private – Non-NFS) have been included as part of Segment 11. Spur road is required when access road is over 50' from structure site.

11 Setups site dimemsions vary due to terrain. The 16 wire stringing sites on NFS lands, as identified in the GIS data, are assumed to have the following dimensions (as detailed in the PEA): =(400*200*2)+(400*100*5)+(550*100)+(250*100)+(400*100+3650)+(150*100*2)+(300*100+5525)+ (300*100*2). The additional wire stringing sites located off NFS lands in Segment 6 (3 total) are assumed to be 150'x300' per the GIS data.

12 Approximately every 15,000' and at points of inflection or dead-ends.

13 The number of total spur roads is assumed to be proportional to the quantity of structures constructed utilizing ground-based operations ratioed from the PEA, where 138 structures are constructed utilizing ground-based operations resulting in 75 total spurs.

14 Assume typical landing pad (40'x40') for every tower constructed by helicopter, of which 75 percent would be considered permanent to support operations and maintenance activities.

15 Assume 2 small support yards for personnel drop-off/pick-up, emergency landing, etc. per large helicopter staging/support area.

16 Average helicopter staging/support area of 4 acres assumed for most staging areas, although the size could range substantially depending on land available and intended use. For example, exceptions to this assumption include two sites on NFS lands: SCE#6B (1.85 acres) and SCE#10 (8 acres).

Table 2.2-8. Proposed Project Estimate of Land Disturbance – Segment 7: New Mira Loma – Vincent 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Guard Pole Hole [1] (qty street crossings on quad maps)	26	P/4(28"/12)**2x6 locs *1.2	0.023	0.023	0.00
Guard Pole Truck Disturbance [2] (same above)	26	2 tracks x10'x2'x6 locs	0.143	0.143	0.00
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	3	(150' X 150')/2	0.77	0.77	0.00
TSP Foundation Holes [3] (qty TSP)	2	=PI()*((108"/2)^2)	0.002	0.00	0.002
TSP Pole Hole Truck Disturbance [4] (same above)	2	2 tracks x20'x2'	0.004	0.004	0.00
LST Footing Holes [5] (qty LST)	83	=PI()*((54"/2)^2)	0.096	0.00	0.098
LST Footings Truck Disturbance [6] (same above)	83	2 tracks x20'x2'x4 locs	2.439	2.439	0.00
LST and TSP Laydown and Assembly Area [7] (varies)	89	See note 7	76.843	76.843	0.00
Crane Pad for Erection (qty structures)	2	50' X 50'	0.115	0.115	0.00
Wire Stringing Areas (pulling/tensioning/splicing) [11.12] (qty setups) <overlap demolition/new>	16	See note 11	23.116	23.116	0.00
Roads New Access (qty miles)	0	L X 16' wide	0.00	0.00	0.00
Roads New Spur (qty miles)[10]	0.401	L X 16' wide	0.778	0.00	0.778
Roads Existing, <impacted areas of roads only> (qty miles)	16.19	L X 16' wide	31.399	31.399	0.00
Radius from access road to spur road (# Spur Roads Total)	50	50' R requires 1464 sq. ft.	1.680	0.00	1.680
Spur Rd Related Temp Disturbed Areas[8]	10	566 sq. ft per spur road	0.130	0.130	0.00
Additional Spur Rd Radius for TSP and LST haul Trucks [9]	10	2285 sq. ft. per spur road	0.525	0.525	0.00
Staging Areas for Materials and Equipment	1	3-5 acres per yard	5.00	5.00	0.00
Total Estimated			143.06	140.56	2.56
LAND DISTURBANCE RANGE (±15%)			121.6 – 164.5.		2.2 – 2.9

Source: SCE, 2007a – PEA Table 3.3-5; SCE, 2007f – DR#4 Q4-01 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Guard pole-assume two guard poles per each side of street thus 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 20% more crossings present.

2 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

3 TSP-assume 108" dia x 35' depth with overbore for concrete backfill based on conventional footing construction.

4 TSP-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to one locations per TSP approx. 20" from stub road.

5 LST-assume 54" dia x 20' depth with overbore for concrete backfill based on conventional footing construction.

6 LST-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to four locations per LST approx. 20" from stub road.

7 LST and TSP structure layout, assembly and erection dimensions vary due to quantity of structures to be worked on located within immediate vicinity =(150*150*13)+(150*225*1)+(150*455*1)+(200*200*73)+(200*235).

8 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2).

9 Difference between 80' radius and 80' radius from access to spur road for access by 80' trailer bed truck.

10 Spur road is required when access road is over 50' from structure site.

11 Setups site dimensions vary due to terrain, industrial and commercial areas, with approx. 40% of a 200' x 400' site being disturbed: =(400*100)+(400*150*12)+(500*150*2)+(150*600).

12 Approximately every 15,000' and at points of inflection or dead-end structures when convenient.

Table 2.2-9. Proposed Project Estimate of Land Disturbance – Segment 8: New Mira Loma – Vincent 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Guard Pole Hole [1] (qty street crossings on quad maps)	70	P/4(28"/12)**2x6 locs *1.5	0.062	0.062	0.00
Guard Pole Truck Disturbance [2] (same above)	70	2 tracks x10'x2'x6 locs	0.386	0.386	0.00
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	20	(150' X 150')/2	5.17	5.17	0.00
TSP Foundation Holes [3] (qty TSP)	60	=PI()*((108"/2)^2)	0.069	0.00	0.069
TSP Pole Hole Truck Disturbance [4] (same above)	60	2 tracks x20'x2'	0.110	0.110	0.00
LST Footing Holes [5] (qty LST)	160	=PI()*((54"/2)^2)	0.046	0.00	0.046
LST Footings Truck Disturbance [6] (same above)	160	2 tracks x20'x2'x4 locs	1.175	1.175	0.00
LST and TSP Laydown and Assembly Area[7] (varies)	220	See note 7	174.673	174.673	0.00
Crane Pad for Erection (qty structures)	50	50' X 50'	2.87	2.87	0.00
Wire Stringing Areas (pulling/tensioning/splicing) [11.12] (qty setups) <overlap demolition/new>	33	See notes 11 and 12	59.745	59.745	0.00
Roads New Access (qty miles)	0	L X 16' wide	0.00	0.00	0.00
Roads New Spur (qty miles) [10]	6.1	L X 16' wide	11.830	0.00	11.830
Roads Existing, <impacted areas of roads only> (qty miles)	41	L X 16' wide	79.515	79.515	0.00
Radius from access road to spur road (# Spur Roads Total)	89	50' R requires 1464 sq. ft.	2.991	0.00	2.991
Spur Rd Related Temp Disturbed Areas[8]	30	566 sq. ft per spur road	0.390	0.390	0.00
Additional Spur Rd Radius for TSP and LST haul Trucks [9]	20	2285 sq. ft. per spur road	1.049	1.049	0.00
Staging Areas for Materials and Equipment	2-3	3-5 acres per yard	15.00	15.00	0.00
Total Estimated			355.08	340.14	14.94
LAND DISTURBANCE RANGE (±15%)			301.8 – 408.4		12.7 – 17.2

Source: SCE, 2007a – PEA Table 3.3-6; SCE, 2007f – DR#4 Q4-01 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Guard pole-assume two guard poles per each side of street thus 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 20% more crossings present.

2 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

3 TSP-assume 108" dia x 35' depth with overbore for concrete backfill based on conventional footing construction.

4 TSP-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to one locations per TSP approx. 20" from stub road.

5 LST-assume 54" dia x 20' depth with overbore for concrete backfill based on conventional footing construction.

6 LST-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to four locations per LST approx. 20" from stub road.

7 LST and TSP structure layout, assembly and erection dimensions vary due to quantity of structures to be worked on located within immediate vicinity: =(100*200*1)+(150*150*12)+(150*200*1)+(150*250*63)+(275*150)+(450*150)+ (200*200*106)+(250*200*3)+(300*200)+(325*200)+(400*200)+(250*250)+(400*400)

8 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2).

9 Difference between 80' radius and 80' radius from access to spur road for access by 80' trailer bed truck.

10 Spur road is required when access road is over 50' from structure site.

11 Setups site dimensions vary due to terrain, industrial and commercial areas, with approx. 40% of a 200' x 400' site being disturbed: =(200*100)+(250*100*2)+(300*100*1)+(400*100*2)+(150*250)+(150*300)+(150*400*33)+ (200*200*3)+(200*400*3)

12 Approximately every 15,000' and at points of inflection or DE structures when convenient.

Table 2.2-10. Estimate of Land Disturbance – Whirlwind Substation Site		
Element	Dimensions	Area of Disturbance (acres)
Substation Pad	---	56.0
Retention Pond SPCC Pond	305 feet x 388 feet 205 feet x 110 feet	2.7 0.5
Side Slope Grading	---	9.0 ~~8.0~~
Primary Access Road	~~40 feet x 800 feet~~	1.0 ~~0.7~~
Secondary Access Road	~~30 feet x 440 feet~~	0.8 ~~0.3~~
Substation Pad (Expansion Area)		26.8
Total Estimated		96.8~~65.0~~
LAND DISTURBANCE RANGE (±15%)	---	82.3 – 111.3 ~~55.3 – 74.8~~

Source: SCE, 2007a – PEA Table 3.3-9 (Updated/corrected as part of EIR/EIS process); SCE, 2009d. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

Table 2.2-11. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 10: New Whirlwind – Windhub 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Survey					
Truck, Pick-Up	180	Gas	2	2.5	3
Marshalling Yards					
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	1	2.5	4
Truck, Semi, Tractor	310	Diesel	1	1.5	
Trailer, Flatbed, 40'	N/A	N/A	1	N/A	
Loader, Front End, w/ Bucket	145	Diesel	1	1.0	
Forklift, 5 Ton	75	Diesel	1	5.0	
Forklift, 10 Ton	85	Diesel	1	5.0	
Truck, Pick-Up	180	Gas	1	3.0	
Truck, Flatbed, 1 Ton	180	Gas	1	1.5	
Trailer, Office, 40' - 60'	N/A	N/A	1	N/A	
Trailer, Storage, 40'	N/A	N/A	3	N/A	
Roads and Landing Work					
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	9.0	10
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	9.0	
Truck, Semi, Tractor	310	Diesel	1	1.5	
Trailer, Lowboy, 30'	N/A	N/A	1	N/A	
Motor Grader	110	Diesel	1	5.0	
Truck, Water, 2,000 – 4,000 gal	175	Diesel	1	5.0	
Back Hoe, w/ Bucket	85	Diesel	1	3.0	
Truck, Pick-Up	210	Diesel	1	3.0	
Truck, Flatbed, 1 Ton	210	Diesel	1	3.0	
Install Foundations					
Digger, Transmission Type, Truck Mount	190	Diesel	1	9.0	18
Truck, Flatbed, 2 Ton	210	Diesel	3	2.5	
Truck, Concrete, 10 Yd	310	Diesel	6	5.0	
Truck, Flatbed w/Boom, 5 Ton	235	Diesel	2	2.5	
Crawler, Track Type, Drill Rig, Pneumatic	305	Diesel	1	9.0	
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	4.0	
Truck, Semi, Tractor	310	Diesel	1	2.0	
Trailer. Lowboy, 30'	N/A	N/A	1	N/A	
Back Hoe, w/Bucket	85	Diesel	1	5.0	
Truck, Dump, 10 Ton	235	Diesel	1	2.5	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	2	5.0	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	5.0	
Truck, Pick-Up	210	Diesel	3	3.0	
Truck, Flatbed, 1 Ton	210	Diesel	3	3.0	

Table 2.2-11. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 10: New Whirlwind – Windhub 500-kV T/L					
Motor, Auxiliary Power	5	Gas	3	2.0	
Trailer, Storage, 40'	N/A	N/A	3	N/A	
Steel (Shake-out, Hauling, Light Assembly, Heavy Assembly, Erection)					
Crane, Hydraulic, 150 Ton	250	Diesel	1	9.0	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	5	9.0	
Truck, Flatbed w/ Boom, 5 Ton	235	Diesel	2	5.0	
Truck, Flatbed, 2 Ton	235	Gas	4	2.5	
Truck, Pick-Up	180	Gas	8	7.5	
Truck, Flatbed, 1 Ton	180	Gas	6	1.0	
Trailer, Lowboy, 30'	N/A	N/A	N/A	N/A	
Truck, Semi, Tractor	310	Diesel	3	2.0	61
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	2.0	
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	2.0	
Trailer, Flatbed, 40'	N/A	N/A	3	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	7.5	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	7.5	
Compressor, Air	75	Gas	5	7.5	
Conductor & OHGW Installation					
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	3	9.0	
Tension Machine	135	Diesel	1	5.0	
Truck, Wire Puller, 3 Drum	310	Diesel	1	2.5	
Truck, Wire Puller, 1 Drum	310	Diesel	1	5.0	
Truck, Semi, Tractor	310	Diesel	3	7.5	
Trailer, Lowboy & Reel Stand	N/A	N/A	5	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	9.0	
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	2.5	
Crawler, Track Type, Sagging (D8 type)	305	Diesel	2	5.0	
Truck, Flatbed, 1 Ton	180	Gas	7	5.0	49
Truck, Pick-Up	180	Gas	3	9.0	
Back Hoe, w/ Bucket	85	Diesel	1	3.5	
Digger, Transmission Type, Truck Mount	190	Diesel	1	1.0	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	7.5	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	2	3.5	
Motor, Auxiliary Power	5	Gas	4	4.0	
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	3	9.0	
Tension Machine	135	Diesel	1	5.0	
Truck, Wire Puller, 3 Drum	310	Diesel	1	2.5	
Truck, Wire Puller, 1 Drum	310	Diesel	1	5.0	
Clean-up & Guard Poles					
Truck, Flatbed w/ Boom, 5 Ton	235	Diesel	1	5.0	
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	1	5.0	
Back Hoe, w/ Bucket	85	Diesel	1	5.0	
Truck, Semi, Tractor	310	Diesel	1	9.0	6
Trailer, Extendable Pole	N/A	N/A	1	N/A	
Motor Grader	110	Diesel	1	9.0	
Truck, Flatbed, 1 Ton	210	Diesel	2	7.5	
Truck, Pick-Up	210	Diesel	2	7.5	

Source: SCE, 2007a – PEA Table 3.4-7 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-12. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 4: Cottonwind – Whirlwind 220-kV T/L					
Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Survey					
1/2 Ton Pick-up Truck, 4X4	200	Gas	2	8	4
Marshalling Yards					
1 Ton Crew Cab 4X4	300	Diesel	1	2	4
30 Ton Crane Truck	300	Diesel	1	2	

Table 2.2-12. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 4: Cottonwind – Whirlwind 220-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	5	
40' Flat Bed Trailers	N/A	N/A	3	2	
Truck, Semi, Tractor	350	Diesel	1	1	
Office Trailer	N/A	N/A	1	N/A	
Storage Containers	N/A	N/A	3	N/A	
Roads and Landing Work					
1 Ton Crew Cab 4X4	300	Diesel	2	2	
Road Grader	350	Diesel	1	6	
Track Type Dozer	350	Diesel	1	6	
Drum Type Compactor	250	Diesel	1	6	7
Water Trucks	350	Diesel	2	9	
Lowboy Trk/Trlr	500	Diesel	1	4	
Excavator	300	Diesel	1	6	
Backhoe	350	Diesel	1	6	
Install Foundations					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	9	2	
30 Ton Crane Truck	300	Diesel	2	5	
Backhoe	200	Diesel	2	8	
Diggers	500	Diesel	2	8	24
4000 gallon Water Trucks	350	Diesel	2	8	
10 cu.yd. Concrete Mixer Trucks	425	Diesel	8	5	
Tower Legs, Haul & Erect					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	2	
30 Ton Crane Truck	300	Diesel	2	6	10
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	6	
Tower Steel Haul					
40' Flat Bed Truck & Trailer	350	Diesel	2	8	6
Tower Assembly					
80 Ton Rough Terrain Cranes	400	Diesel	2	4	
30 Ton Crane Truck	300	Diesel	2	6	
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	5	
3/4 Ton Pick-up Truck, 4X4	300	Diesel	4	2	16
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	2	
Compressor Truck	350	Diesel	2	6	
Tower Erection					
3/4 Ton Pick-up Truck, 4X4	300	Diesel	2	5	
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	5	
Compressor Truck	350	Diesel	2	5	16
180 Ton Rough Terrain Crane	500	Diesel	2	6	
Conductor & OHGW Installation					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	4	8	
Wire Trucks & Trailers	350	Diesel	6	2	
Dump Truck (Trash)	350	Diesel	1	2	
3/4 Ton Pick-up Truck, 4X4	300	Diesel	6	10	
30 Ton Manitex	350	Diesel	9	6	
22 Ton Manitex	350	Diesel	1	8	
Sleeving Rigs	350	Diesel	2	2	
Log Truck & Trailer	500	Diesel	1	2	
20,000 lb. Rough Terrain Fork Lift	350	Diesel	1	2	
580 Case Backhoe	120	Diesel	1	2	40
Spacing Carts	10	Diesel	4	4	
Static Truck	350	Diesel	1	2	
Static Tensioner	0	Diesel	1	2	
3 Drum Strawline Pullers	300	Diesel	2	4	
60lk Puller	525	Diesel	1	3	
Sag Cat w2 winches	350	Diesel	2	2	
D8 Cats	300	Diesel	4	1	
Hughes 500 E Helicopter		Jet A	1	4	
Fuel, Helicopter Support Truck	300	Diesel	1	2	

Table 2.2-12. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 4: Cottonwind – Whirlwind 220-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Low Boy Truck & Trailer	500	Diesel	1	2	
Restoration					
1 Ton Crew Cab 4X4	300	Diesel	3	2	7
Backhoe	350	Diesel	2	6	
Track Type Dozer	350	Diesel	1	6	
Drum Type Compactor	250	Diesel	1	6	
Water Trucks	350	Diesel	2	10	
Lowboy Trk/Trlr	500	Diesel	1	2	
Excavator	300	Diesel	1	3	

Source: SCE, 2007a – PEA Table 3.4-1 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

2.2-13. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 4: ~~Antelope~~Vincent – Whirlwind 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Survey					
1/2 Ton Pick-up Truck, 4X4	200	Gas	2	8	4
Marshalling Yards					
1 Ton Crew Cab 4X4	300	Diesel	1	2	4
30 Ton Crane Truck	300	Diesel	1	2	
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	5	
40' Flat Bed Trailers	N/A	N/A	3	2	
Truck, Semi, Tractor	350	Diesel	1	1	
Office Trailer	N/A	N/A	1	N/A	
Storage Containers	N/A	N/A	3	N/A	
Roads and Landing Work					
1 Ton Crew Cab 4X4	300	Diesel	2	2	8
Road Grader	350	Diesel	1	6	
Track Type Dozer	350	Diesel	1	6	
Drum Type Compactor	250	Diesel	1	6	
Water Trucks	350	Diesel	3	9	
Lowboy Trk/Trlr	500	Diesel	1	4	
Excavator	300	Diesel	1	6	
Backhoe	350	Diesel	1	6	
Remove Existing Conductor & OHGW					
1 Ton Crew Cab 4X4	300	Diesel	4	2	15
80ft. Hydraulic Man-lift	350	Diesel	3	8	
Sleeving Truck	300	Diesel	1	4	
30 Ton Crane Truck	300	Diesel	1	4	
Bull Wheel Puller	500	Diesel	1	6	
Hydraulic Rewind Puller	300	Diesel	1	6	
Remove Existing Towers					
1 Ton Crew Cab, 4X4	300	Diesel	3	2	16
100 Ton Rough Terrain Crane	350	Diesel	1	4	
30 Ton Crane Truck	300	Diesel	2	8	
Compressor Trucks	300	Diesel	2	6	
Flat Bed Truck & Trailer	350	Diesel	1	8	
Rough Terrain Forklift	200	Diesel	1	8	
Remove Existing Foundations					
10 cu.yd Dump Truck	350	Diesel	2	9	8
Excavators	300	Diesel	2	9	
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	4	2	
Installed Foundations					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	9	2	24
30 Ton Crane Truck	300	Diesel	2	5	

2.2-13. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 4: ~~Antelope~~Vincent – Whirlwind 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Backhoe	200	Diesel	2	8	
Diggers	500	Diesel	2	8	
4000 gallon Water Trucks	350	Diesel	2	8	
10 cu.yd. Concrete Mixer Trucks	425	Diesel	8	5	
Tower Legs, Haul & Erect					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	2	
30 Ton Crane Truck	300	Diesel	2	6	10
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	6	
Tower Steel Haul					
40' Flat Bed Truck & Trailer	350	Diesel	2	8	6
Tower Assembly					
80 Ton Rough Terrain Cranes	400	Diesel	2	4	
30 Ton Crane Truck	300	Diesel	2	6	
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	5	16
3/4 Ton Pick-up Truck, 4X4	300	Diesel	4	2	
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	2	
Compressor Truck	350	Diesel	2	6	
Tower Erection					
3/4 Ton Pick-up Truck, 4X4	300	Diesel	2	5	
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	5	16
Compressor Truck	350	Diesel	2	5	
180 Ton Rough Terrain Crane	500	Diesel	2	6	
Conductor & OHGW Installation					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	4	8	
Wire Trucks & Trailers	350	Diesel	6	2	
Dump Truck (Trash)	350	Diesel	1	2	
3/4 Ton Pick-up Truck, 4X4	300	Diesel	6	10	
30 Ton Manitex	350	Diesel	9	6	
22 Ton Manitex	350	Diesel	1	8	
Sleeving Rigs	350	Diesel	2	2	
Log Truck & Trailer	500	Diesel	1	2	
20,000 lb. Rough Terrain Fork Lift	350	Diesel	1	2	
580 Case Backhoe	120	Diesel	1	2	
Spacing Carts	10	Diesel	4	4	40
Static Truck	350	Diesel	1	2	
Static Tensioner	0	Diesel	1	2	
3 Drum Strawline Pullers	300	Diesel	2	4	
60lk Puller	525	Diesel	1	3	
Sag Cat w2 winches	350	Diesel	2	2	
D8 Cats	300	Diesel	4	1	
Hughes 500 E Helicopter		Jet A	1	4	
Fuel, Helicopter Support Truck	300	Diesel	1	2	
Low Boy Truck & Trailer	500	Diesel	1	2	
Restoration					
1 Ton Crew Cab 4X4	300	Diesel	3	2	
Backhoe	350	Diesel	2	6	
Track Type Dozer	350	Diesel	1	6	
Drum Type Compactor	250	Diesel	1	6	7
Water Trucks	350	Diesel	2	10	
Lowboy Trk/Trlr	500	Diesel	1	2	
Excavator	300	Diesel	1	3	

Source: SCE, 2007a – PEA Table 3.4-2 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-14. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 5: Antelope – Vincent 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Survey					
1/2 Ton Pick-up Truck, 4X4	200	Gas	2	8	3
Marshalling Yards					
1 Ton Crew Cab 4X4	300	Diesel	1	2	4
30 Ton Crane Truck	300	Diesel	1	2	
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	5	
40' Flat Bed Trailers	N/A	N/A	3	2	
Truck, Semi, Tractor	350	Diesel	1	1	
Office Trailer	N/A	N/A	1	N/A	
Storage Containers	N/A	N/A	3	N/A	
Roads and Landing Work					
1 Ton Crew Cab 4X4	300	Diesel	1	5	7
Road Grader	350	Diesel	1	6	
Track Type Dozer	350	Diesel	1	6	
Drum Type Compactor	250	Diesel	1	6	
Water Trucks	350	Diesel	3	10	
Lowboy Trk/Trlr	500	Diesel	1	4	
Excavator	300	Diesel	1	6	
Front End Loader	350	Diesel	1	6	
Remove Existing Conductor & OHGW					
1 Ton Crew Cab 4X4	300	Diesel	4	8	15
80ft. Hydraulic Man-lift	350	Diesel	3	8	
Sleeving Truck	300	Diesel	1	4	
30 Ton Crane Truck	300	Diesel	1	4	
Bull Wheel Puller	500	Diesel	1	6	
Hydraulic Rewind Puller	300	Diesel	1	6	
Remove Existing Towers					
1 Ton Crew Cab, 4X4	300	Diesel	3	5	20
80 Ton Rough Terrain Crane	350	Diesel	1	8	
30 Ton Crane Truck	300	Diesel	2	8	
Compressor Trucks	300	Diesel	2	8	
Flat Bed Truck & Trailer	350	Diesel	1	10	
Rough Terrain Forklift	200	Diesel	1	8	
Remove Existing Foundations					
10 cu. yd. Dump Truck	350	Diesel	2	10	5
Excavators	300	Diesel	2	8	
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	1	10	
Installed Foundations					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	4	6	20
30 Ton Crane Truck	300	Diesel	2	5	
Front End Loader	200	Diesel	1	5	
Diggers	500	Diesel	2	8	
4000 gallon Water Trucks	350	Diesel	2	5	
10-yd. Concrete Mixer Trucks	425	Diesel	6	5	
Tower Legs, Haul & Erect					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	1	6	6
30 Ton Crane Truck	300	Diesel	1	8	
10,000 lb Rough Terrain Fork Lift	200	Diesel	1	6	
40' Flat Bed Truck & Trailer	350	Diesel	1	5	
Tower Steel Haul					
10,000 lb Rough Terrain Fork Lift	200	Diesel	1	8	6
40' Flat Bed Truck & Trailer	350	Diesel	2	10	
Tower Assembly					
80 Ton Rough Terrain Cranes	400	Diesel	2	8	30
30 Ton Crane Truck	300	Diesel	2	8	
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	5	

Table 2.2-14. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 5: Antelope – Vincent 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
3/4 Ton Pick-up Truck, 4X4	300	Diesel	3	10	
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	4	5	
Compressor Truck	350	Diesel	2	5	
Tower Erection					
3/4 Ton Pick-up Truck, 4X4	300	Diesel	1	5	
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	5	16
Compressor Truck	350	Diesel	1	5	
180 Ton Rough Terrain Crane	500	Diesel	1	6	
Conductor & OHGW Installation					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	9	8	
Wire Trucks & Trailers	350	Diesel	6	2	
Dump Truck (Trash)	350	Diesel	1	2	
3/4 Ton Pick-up Truck, 4X4	300	Diesel	1	10	
30 Ton Manitex	350	Diesel	9	6	
22 Ton Manitex	350	Diesel	1	8	
Sleeving Rigs	350	Diesel	2	2	
Log Truck & Trailer	500	Diesel	1	2	
20,000 lb. Rough Terrain Fork Lift	350	Diesel	1	2	
580 Case Backhoe	120	Diesel	1	2	
Spacing Carts	10	Diesel	4	4	40
Static Truck	350	Diesel	1	2	
Static Tensioner	0	Diesel	1	2	
3 Drum Strawline Pullers	300	Diesel	2	4	
60lk Puller	525	Diesel	1	3	
Sag Cat w2 winches	350	Diesel	1	2	
D8 Cats	300	Diesel	4	1	
Hughes 500 E Helicopter		Jet A	1	4	
Fuel, Helicopter Support Truck	300	Diesel	1	2	
Low Boy Truck & Trailer	500	Diesel	1	2	
Restoration					
1 Ton Crew Cab 4X4	300	Diesel	1	5	
Road Grader	350	Diesel	1	6	
Track Type Dozer	350	Diesel	1	6	
Drum Type Compactor	250	Diesel	1	6	
Water Trucks	350	Diesel	3	10	7
Lowboy Trk/Trlr	500	Diesel	1	4	
Excavator	300	Diesel	1	6	
Front End Loader	350	Diesel	1	6	

Source: SCE, 2007a – PEA Table 3.4-3 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-15. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Helicopter Support					
Hughes 500 Helicopter		Jet A	1	6	2
Support Fuel Truck	300	Diesel	1	3	
Marshalling Yards					
1 Ton Crew Cab 4X4	300	Diesel	1	2	4
30 Ton Crane Truck	300	Diesel	1	2	
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	8	
40' Flat Bed Trailers	N/A	N/A	3	2	
Truck, Semi, Tractor	350	Diesel	1	1	
Office Trailer	N/A	N/A	1	N/A	
Storage Containers	N/A	N/A	3	N/A	
Upgrade Existing Roads and Landing Work					
3/4 Ton PU, 4X4	300	Diesel	1	6	11
1 Ton Crew Cab 4X4	300	Diesel	1	5	
Road Grader	350	Diesel	1	6	
Track Type Dozer	350	Diesel	1	6	
Dump Trucks	350	Diesel	2	4	
Drum Type Compactor	250	Diesel	1	6	
Water Trucks	350	Diesel	3	10	
Lowboy Trk/Trlr	500	Diesel	1	4	
Excavator	300	Diesel	1	6	
Front End Loader	350	Diesel	1	6	
Construct New Roads and Landing Work					
3/4 Ton PU, 4X4	300	Diesel	1	6	11
1 Ton Crew Cab 4X4	300	Diesel	1	5	
Road Grader	350	Diesel	1	6	
Track Type Dozer	350	Diesel	1	6	
Dump Trucks	350	Diesel	2	4	
Drum Type Compactor	250	Diesel	1	6	
Water Trucks	350	Diesel	3	10	
Lowboy Trk/Trlr	500	Diesel	1	4	
Excavator	300	Diesel	1	6	
Front End Loader	350	Diesel	1	6	
Unclip & Doublesock Conductor & OPGW					
3/4 Ton PU, 4X4	300	Diesel	1	10	14
1 Ton Crew Cab 4X4	300	Diesel	3	8	
Helicopter Hughes 500	500	Jet A	1	6	
Helicopter Support Truck	300	Diesel	1	4	
Remove Existing Conductor & OHGW					
3/4 Ton PU, 4X4	300	Diesel	2	6	7
1 Ton Crew Cab 4X4	300	Diesel	1	8	
80ft. Hydraulic Man-lift	350	Diesel	3	8	
Sleeving Truck	300	Diesel	1	4	
30 Ton Crane Truck	300	Diesel	1	4	
V-Groove Puller	500	Diesel	1	6	
40' Flat Bed Trailers	N/A	N/A	1	6	
Truck, Semi, Tractor	350	Diesel	1	4	
Remove Existing Towers					
3/4 Ton PU, 4X4	300	Diesel	4	6	22
1 Ton Crew Cab, 4X4	300	Diesel	3	5	
Helicopter, Sikorsky S64 Sky Crane	10000	Jet A	1	8	
Helicopter support fuel tanker	300	Diesel	1	8	
Helicopter support POD	300	Diesel	1	8	

Table 2.2-15. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Disassemble and Scrap Existing Towers					
1 Ton Crew Cab, 4X4	300	Diesel	1	5	5
30 Ton Crane Truck	300	Diesel	1	6	
Compressor Trucks	300	Diesel	1	8	
Flat Bed Truck & Trailer	350	Diesel	1	4	
Rough Terrain Forklift	200	Diesel	1	8	
Remove Existing Foundations (with access)					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	1	6	5
10 cu yd Dump Truck	350	Diesel	2	8	
Excavators	300	Diesel	2	8	
Front End Loader	250	Diesel	1	4	
Remove Existing Foundations (no access)					
3/4 Ton PU. 4X4	300	Diesel	1	8	9
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	2	
10 cu yd Dump Truck	350	Diesel	1	6	
250 cfm compressors	150	Diesel	2	6	
Helicopter (Sikorsky S61 Class)	2500	Jet A	1	2	
Helicopter Support Fuel Tanker	350	Diesel	1	2	
Surveying					
1/2 Ton Pick-up Truck, 4X4	200	Gas	2	8	3
Excavate for Foundations (no access)					
3/4 Ton PU. 4X4	300	Diesel	2	8	14
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	3	
10 cu yd Dump Truck	350	Diesel	1	2	
250 cfm compressors	150	Diesel	2	6	
Excavate for Foundations (with access)					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	3	6	10
30 Ton Crane Truck	300	Diesel	1	5	
Front End Loader	200	Diesel	2	5	
Diggers	500	Diesel	2	8	
4000 gallon Water Trucks	350	Diesel	2	5	
Rock Drill Rig	350	Diesel	1	6	
Install Foundations (no access)					
3/4 Ton PU. 4X4	300	Diesel	1	8	9
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	6	
22 Ton Crane Truck	300	Diesel	2	5	
4000 gallon Water Trucks	350	Diesel	2	5	
10 cu yd. Concrete Mixer Trucks	425	Diesel	4	5	
Helicopter (Sikorsky S61 Class)	2500	Jet A	1	2	
Helicopter Support Fuel Tanker	350	Diesel	1	2	
Install Foundations (with access)					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	2	6	12
22 Ton Crane Truck	300	Diesel	2	5	
4000 gallon Water Trucks	350	Diesel	2	5	
10 cu yd. Concrete Mixer Trucks	425	Diesel	4	5	
Tower Legs, Haul & Erect					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	1	6	7
30 Ton Crane Truck	300	Diesel	1	8	
10,000 lb Rough Terrain Fork Lift	200	Diesel	1	6	
40' Flat Bed Truck & Trailer	350	Diesel	1	5	
Helicopter (Sikorsky S61 Class)	2500	Jet A	1	5	
Helicopter Support Fuel Tanker	350	Diesel	1	2	
Tower Steel Haul					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	1	6	4
10,000 lb Rough Terrain Fork Lift	200	Diesel	1	8	
40' Flat Bed Truck & Trailer	350	Diesel	2	10	

Table 2.2-15. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Tower Assembly & Dress to Fly					
80 Ton Rough Terrain Cranes	400	Diesel	2	8	30
30 Ton Crane Truck	300	Diesel	2	8	
10,000 lb Rough Terrain Fork Lift	200	Diesel	2	5	
3/4 Ton Pick-up Truck, 4X4	300	Diesel	3	10	
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	4	5	
Compressor Truck	350	Diesel	2	5	
Tower Erection, Back Bolt & Torque					
3/4 Ton Pick-up Truck, 4X4	300	Diesel	2	8	30
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	3	6	
Compressor Truck	350	Diesel	1	4	
Helicopter, Sikorsky S64 Sky Crane	10000	Jet A	1	8	
Helicopter support fuel tanker	300	Diesel	1	8	
Helicopter support POD	300	Diesel	1	8	
Conductor & OHGW Installation					
1 Ton Crew Cab Flat Bed, 4X4	300	Diesel	9	8	40
Wire Trucks & Trailers	350	Diesel	6	2	
Dump Truck (Trash)	350	Diesel	1	2	
3/4 Ton Pick-up Truck, 4X4	300	Diesel	1	10	
30 Ton Manitex	350	Diesel	9	6	
22 Ton Manitex	350	Diesel	1	8	
Sleeving Rigs	350	Diesel	2	2	
Log Truck & Trailer	500	Diesel	1	2	
20,000 lb. Rough Terrain Fork Lift	350	Diesel	1	2	
580 Case Backhoe	120	Diesel	1	2	
Spacing Carts	10	Diesel	4	4	
Static Truck	350	Diesel	1	2	
Static Tensioner	0	Diesel	1	2	
3 Drum Strawline Pullers	300	Diesel	2	4	
60lk Puller	525	Diesel	1	3	
Sag Cat w2 winches	350	Diesel	1	2	
D8 Cats	300	Diesel	4	1	
Hughes 500 E Helicopter		Jet A	1	4	
Fuel, Helicopter Support Truck	300	Diesel	1	2	
Low Boy Truck & Trailer	500	Diesel	1	2	
Restoration					
1 Ton Crew Cab 4X4	300	Diesel	1	5	7
Road Grader	350	Diesel	1	6	
Track Type Dozer	350	Diesel	1	6	
Drum Type Compactor	250	Diesel	1	6	
Water Trucks	350	Diesel	3	10	
Lowboy Trk/Trlr	500	Diesel	1	4	
Excavator	300	Diesel	1	6	
Front End Loader	350	Diesel	1	6	

Source: SCE, 2007a – PEA Table 3.4-8 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-16. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 6: New Replacement Rio Hondo – Vincent No. 2 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Construction Inspection					
Truck, Pick-Up	180	Gas	5	6.00	5
Marshalling Yards					
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	1	3.00	6
Truck, Semi, Tractor	310	Diesel	1	2.00	
Trailer, Flatbed, 40'	N/A	N/A	1	N/A	
Loader, Front End, w/ Bucket	145	Diesel	1	2.00	
Forklift, 5 Ton	75	Diesel	1	6.00	
Forklift, 10 Ton	85	Diesel	1	6.00	
Truck, Pick-Up	180	Gas	2	3.00	
Truck, Flatbed, 1 Ton	180	Gas	1	2.00	
Motor, Auxiliary Power	5	Gas	1	1.00	
Trailer, Office, 40' - 60'	N/A	N/A	1	N/A	
Survey (Roads, Pads and Structure Locations)					
Truck, Pick-Up	180	Gas	2	3.00	3
Road Work					
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	2	8.00	12
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	8.00	
Truck, Semi, Tractor	310	Diesel	2	4.00	
Trailer, Lowboy	N/A	N/A	2	N/A	
Motor Grader	110	Diesel	1	5.00	
Truck, Water, 2,000 - 4,000 gal	175	Diesel	1	5.00	
Excavator, Grade-All	165	Diesel	2	8.00	
Back Hoe, w/ Bucket	85	Diesel	2	3.00	
Truck, Dump, 10 Ton	235	Diesel	4	3.00	
Truck, Pick-Up	210	Diesel	2	3.00	
Truck, Crew Cab Flatbed, 1 Ton	210	Diesel	4	3.00	
Wreck-Out (Conductors, Structures and Foundations)					
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	3	8.00	26
Truck, Flatbed w/ Boom, 5 Ton	235	Diesel	3	5.00	
Tension Machine	135	Diesel	1	3.00	
Tension Machine	135	Diesel	1	3.00	
Truck, Wire Take Up, Respoller	310	Diesel	1	8.00	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1	4.00	
Truck, Wire Puller, 1 Drum	310	Diesel	1	6.00	
Truck, Semi, Tractor	310	Diesel	4	8.00	
Trailer, Lowboy	N/A	N/A	2	N/A	
Trailer, Flatbed, 40'	N/A	N/A	2	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	8.00	
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	4.00	
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas	3	5.00	
Truck, Pick-Up	180	Gas	2	8.00	
Back Hoe, w/ Concrete Hammer	85	Diesel	4	8.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	6.00	
Truck, Dump, 10 Ton	235	Diesel	2	8.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	2	4.00	
Helicopter		Jet Fuel	1	6.00	
Motor, Auxiliary Power	5	Gas	3	2.00	
Foundations					
Digger, Transmission Type, Truck Mount	190	Diesel	3	8.00	18
Truck, Flatbed, 2 Ton	210	Diesel	2	3.00	
Truck, Concrete, 10 Yd	310	Diesel	4	6.00	
Truck, Flatbed w/Boom, 5 Ton	235	Diesel	2	3.00	
Crawler, Track Type, Drill Rig, Pneumatic	305	Diesel	1	8.00	
Excavator, Grade-All	165	Diesel	1	4.00	
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	3.00	
Truck, Semi, Tractor	310	Diesel	1	3.00	
Trailer, Lowboy, 30'	N/A	N/A	1	N/A	

Table 2.2-16. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 6: New Replacement Rio Hondo – Vincent No. 2 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Back Hoe, w/ Bucket	85	Diesel	2	4.00	
Truck, Dump, 10 Ton	235	Diesel	1	4.00	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	5.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	6.00	
Truck, Pick-Up	210	Diesel	2	3.00	
Truck, Flatbed, 1 Ton	210	Diesel	3	3.00	
Motor, Auxiliary Power	5	Gas	2	2.00	
Trailer, Storage, 40'	N/A	N/A	2	N/A	
Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)					
Crane, Hydraulic, 150/300 Ton	250	Diesel	1	9.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	3	9.00	
Truck, Flatbed, 2 1/2 Ton	235	Gas	3	2.50	
Truck, Pick-Up	180	Gas	4	7.50	
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas	10	1.00	
Truck, Semi, Tractor	310	Diesel	2	2.00	
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	2.00	45
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	2.00	
Trailer, Flatbed, 40'	N/A	N/A	4	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	7.50	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	7.50	
Motor, Auxiliary Power	5	Gas	2	2.00	
Compressor, Air	75	Gas	5	7.50	
Conductor (Sheaves, Insulators, Stringing, Deadending, Clipping and Spacing)					
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	6	8.00	
Tension Machine, Conductor	135	Diesel	2	3.00	
Tension Machine, Static	135	Diesel	1	2.00	
Truck, Wire Puller, 3 Drum	310	Diesel	1	2.00	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1	2.00	
Truck, Wire Puller, 1 Drum	310	Diesel	1	2.00	
Truck, Semi, Tractor	310	Diesel	2	6.00	
Trailer, Lowboy & Reel Stand	N/A	N/A	8	N/A	
Trailer, Flatbed, 40'	N/A	N/A	2	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	8.00	34
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	2.00	
Crawler, Track Type, Sagging (D8 type)	305	Diesel	2	2.00	
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas	8	5.00	
Truck, Pick-Up	180	Gas	4	8.00	
Back Hoe, w/ Bucket	85	Diesel	1	3.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	6.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	3	3.00	
Helicopter		Jet Fuel	2	6.00	
Motor, Auxiliary Power	5	Gas	4	2.00	
Restoration & Guard Poles					
Truck, Flatbed w/ Boom, 5 Ton	235	Diesel	1	5.00	
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	1	5.00	
Back Hoe, w/ Bucket	85	Diesel	1	5.00	
Truck, Semi, Tractor	310	Diesel	1	9.00	
Trailer, Expandable Pole	N/A	N/A	N/A	N/A	6
Digger, Transmission Type, Truck Mount	190	Diesel	1	1.00	
Motor Grader	110	Diesel	1	9.00	
Truck, Flatbed, 1 Ton	210	Diesel	2	7.50	
Truck, Pick-Up	210	Diesel	2	7.50	

Source: SCE, 2007a – PEA Table 3.4-4 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-17. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 7: New Mira Loma – Vincent 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Construction Inspection					
Truck, Pick-Up	180	Gas	5	6.00	5
Marshalling Yards					
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	1	2.00	6
Truck, Semi, Tractor	310	Diesel	1	2.00	
Trailer, Flatbed, 40'	N/A	N/A	1	N/A	
Forklift, 5 Ton	75	Diesel	1	6.00	
Forklift, 10 Ton	85	Diesel	1	6.00	
Truck, Pick-Up	180	Gas	2	4.00	
Truck, Flatbed, 1 Ton	180	Gas	1	2.00	
Motor, Auxiliary Power	5	Gas	1	1.00	
Trailer, Office, 40' - 60'	N/A	N/A	2	N/A	
Survey (Roads, Pads and Structure Locations)					
Truck, Pick-Up	180	Gas	1	3.00	2
Road Work					
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	3.00	3
Truck, Semi, Tractor	310	Diesel	1	3.00	
Trailer, Lowboy	N/A	N/A	1	N/A	
Motor Grader	110	Diesel	1	3.00	
Truck, Water, 2,000 - 4,000 gal	175	Diesel	1	4.00	
Excavator, Grade-All	165	Diesel	1	3.00	
Truck, Dump, 10 Ton	235	Diesel	1	4.00	
Truck, Pick-Up	210	Diesel	1	6.00	
Truck, Crew Cab Flatbed, 1 Ton	210	Diesel	1	6.00	
Guard Poles					
Truck, Flatbed w/ Boom, 5 Ton	235	Diesel	1	4.00	8
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	1	4.00	
Back Hoe, w/ Bucket	85	Diesel	1	3.00	
Truck, Semi, Tractor	310	Diesel	1	3.00	
Trailer, Expandable Pole	N/A	N/A	1	N/A	
Digger, Transmission Type, Truck Mount	190	Diesel	1	3.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	1	3.00	
Truck, Flatbed, 1 Ton	210	Diesel	2	5.00	
Truck, Pick-Up	210	Diesel	1	5.00	
Wreck-Out (Conductors, Structures and Foundations)					
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	3	8.00	43
Truck, Flatbed w/ Boom, 5 Ton	235	Diesel	3	5.00	
Tension Machine	135	Diesel	2	3.00	
Truck, Wire Take Up, Respoller	310	Diesel	1	8.00	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1	4.00	
Truck, Wire Puller, 1 Drum	310	Diesel	1	6.00	
Truck, Semi, Tractor	310	Diesel	4	8.00	
Trailer, Lowboy	N/A	N/A	2	N/A	
Trailer, Flatbed, 40'	N/A	N/A	4	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	6.00	
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	2.00	
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas	5	4.00	
Truck, Pick-Up	180	Gas	3	8.00	
Back Hoe, w/ Concrete Hammer	85	Diesel	3	8.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	8.00	
Truck, Dump, 10 Ton	235	Diesel	2	8.00	
Crane, Hydraulic, 150/300 Ton	250	Diesel	2	6.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	2	4.00	
Helicopter		Jet Fuel	1	6.00	
Motor, Auxiliary Power	5	Gas	3	2.00	
Foundations					
Digger, Transmission Type, Truck Mount	190	Diesel	2	8.00	15
Truck, Flatbed, 2 Ton	210	Diesel	2	3.00	
Truck, Concrete, 10 Yd	310	Diesel	4	5.00	

Table 2.2-17. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 7: New Mira Loma – Vincent 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Truck, Flatbed w/Boom, 5 Ton	235	Diesel	2	3.00	
Excavator, Grade-All	165	Diesel	1	4.00	
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	1.00	
Truck, Semi, Tractor	310	Diesel	1	3.00	
Trailer, Lowboy, 30'	N/A	N/A	1	N/A	
Back Hoe, w/ Bucket	85	Diesel	1	3.00	
Truck, Dump, 10 Ton	235	Diesel	1	4.00	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	3.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	8.00	
Truck, Pick-Up	210	Diesel	2	8.00	
Truck, Flatbed, 1 Ton	210	Diesel	3	4.00	
Motor, Auxiliary Power	5	Gas	2	2.00	
Trailer, Storage, 40'	N/A	N/A	2	N/A	
Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)					
Crane, Hydraulic, 150/300 Ton	250	Diesel	3	8.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	3	6.00	
Truck, Flatbed, 2 1/2 Ton	235	Gas	3	3.00	
Truck, Pick-Up	180	Gas	4	8.00	
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas	12	3.00	
Truck, Semi, Tractor	310	Diesel	2	8.00	80
Trailer, Flatbed, 40'	N/A	N/A	4	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	4.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	6.00	
Motor, Auxiliary Power	5	Gas	2	2.00	
Compressor, Air	75	Gas	5	6.00	
Conductor (Sheaves, Insulators, Stringing, Deadending, Clipping and Spacing)					
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	6	8.00	
Tension Machine, Conductor	135	Diesel	2	3.00	
Tension Machine, Static	135	Diesel	1	2.00	
Truck, Wire Puller, 3 Drum	310	Diesel	1	3.00	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1	2.00	
Truck, Wire Puller, 1 Drum	310	Diesel	1	3.00	
Truck, Semi, Tractor	310	Diesel	2	8.00	
Trailer, Lowboy & Reel Stand	N/A	N/A	8	N/A	
Trailer, Flatbed, 40'	N/A	N/A	2	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	6.00	37
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	2.00	
Crawler, Track Type, Sagging (D8 type)	305	Diesel	2	2.00	
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas	8	5.00	
Truck, Pick-Up	180	Gas	4	8.00	
Back Hoe, w/ Bucket	85	Diesel	1	2.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	6.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	3	3.00	
Helicopter	N/A	Jet Fuel	1	6.00	
Motor, Auxiliary Power	5	Gas	4	2.00	
Restoration					
Truck, Dump, 10 Ton	235	Diesel	1	4.00	
Excavator, Grade-All	165	Diesel	1	4.00	
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	2.00	
Truck, Semi, Tractor	310	Diesel	1	4.00	
Trailer, Lowboy, 30'	N/A	N/A	1	N/A	3
Motor, Auxiliary Power	5	Gas	1	1.00	
Motor Grader	110	Diesel	1	4.00	
Truck, Flatbed, 1 Ton	210	Diesel	1	6.00	
Truck, Pick-Up	210	Diesel	1	6.00	

Source: SCE, 2007a – PEA Table 3.4-5 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-18. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 8: New Mira Loma – Vincent 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Construction Inspection					
Truck, Pick-Up	180	Gas	5	6.00	5
Marshalling Yards					
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	1	2.00	6
Truck, Semi, Tractor	310	Diesel	1	2.00	
Trailer, Flatbed, 40'	N/A	N/A	1	N/A	
Forklift, 5 Ton	75	Diesel	1	6.00	
Forklift, 10 Ton	85	Diesel	1	6.00	
Truck, Pick-Up	180	Gas	2	4.00	
Truck, Flatbed, 1 Ton	180	Gas	1	2.00	
Motor, Auxiliary Power	5	Gas	1	1.00	
Trailer, Office, 40' - 60'	N/A	N/A	2	N/A	
Survey (Roads, Pads and Structure Locations)					
Truck, Pick-Up	180	Gas	1	4.00	2
Road Work					
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	3.00	3
Truck, Semi, Tractor	310	Diesel	1	3.00	
Trailer, Lowboy	N/A	N/A	1	N/A	
Motor Grader	110	Diesel	1	3.00	
Truck, Water, 2,000 - 4,000 gal	175	Diesel	1	4.00	
Excavator, Grade-All	165	Diesel	1	3.00	
Truck, Dump, 10 Ton	235	Diesel	1	4.00	
Truck, Pick-Up	210	Diesel	1	6.00	
Truck, Crew Cab Flatbed, 1 Ton	210	Diesel	1	6.00	
Guard Poles					
Truck, Flatbed w/ Boom, 5 Ton	235	Diesel	1	4.00	6
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	1	4.00	
Back Hoe, w/ Bucket	85	Diesel	1	3.00	
Truck, Semi, Tractor	310	Diesel	1	3.00	
Trailer, Expandable Pole	N/A	N/A	1	N/A	
Digger, Transmission Type, Truck Mount	190	Diesel	1	3.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	1	3.00	
Truck, Flatbed, 1 Ton	210	Diesel	2	5.00	
Truck, Pick-Up	210	Diesel	1	5.00	
Wreck-Out (Conductors, Structures and Foundations)					
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	3	8.00	29
Truck, Flatbed w/ Boom, 5 Ton	235	Diesel	3	5.00	
Tension Machine	135	Diesel	2	3.00	
Truck, Wire Take Up, Respoller	310	Diesel	1	8.00	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1	4.00	
Truck, Wire Puller, 1 Drum	310	Diesel	1	6.00	
Truck, Semi, Tractor	310	Diesel	4	8.00	
Trailer, Lowboy	N/A	N/A	2	N/A	
Trailer, Flatbed, 40'	N/A	N/A	4	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	6.00	
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	2.00	
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas	5	4.00	
Truck, Pick-Up	180	Gas	3	8.00	
Back Hoe, w/ Concrete Hammer	85	Diesel	3	8.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	8.00	
Truck, Dump, 10 Ton	235	Diesel	2	8.00	
Crane, Hydraulic, 150/300 Ton	250	Diesel	2	6.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	2	4.00	
Helicopter	N/A	Jet Fuel	1	6.00	
Motor, Auxiliary Power	5	Gas	3	2.00	
Foundations					
Digger, Transmission Type, Truck Mount	190	Diesel	2	8.00	15
Truck, Flatbed, 2 Ton	210	Diesel	2	3.00	

Table 2.2-18. Proposed Project Construction Equipment and Workforce Estimates By Activity – Segment 8: New Mira Loma – Vincent 500-kV T/L

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)	Estimated Workforce
Truck, Concrete, 10 Yd	310	Diesel	4	5.00	
Truck, Flatbed w/Boom, 5 Ton	235	Diesel	2	3.00	
Excavator, Grade-All	165	Diesel	1	4.00	
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	1.00	
Truck, Semi, Tractor	310	Diesel	1	3.00	
Trailer, Lowboy, 30'	N/A	N/A	1	N/A	
Back Hoe, w/ Bucket	85	Diesel	1	3.00	
Truck, Dump, 10 Ton	235	Diesel	1	4.00	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	3.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	8.00	
Truck, Pick-Up	210	Diesel	2	8.00	
Truck, Flatbed, 1 Ton	210	Diesel	3	4.00	
Motor, Auxiliary Power	5	Gas	2	2.00	
Trailer, Storage, 40'	N/A	N/A	2	N/A	
Steel (Hauling, Shake-out, Light Assembly, Heavy Assembly, Erection)					
Crane, Hydraulic, 150/300 Ton	250	Diesel	3	8.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	3	6.00	
Truck, Flatbed, 2 1/2 Ton	235	Gas	3	3.00	
Truck, Pick-Up	180	Gas	4	8.00	
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas	12	3.00	
Truck, Semi, Tractor	310	Diesel	2	8.00	80
Trailer, Flatbed, 40'	N/A	N/A	4	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	4.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	6.00	
Motor, Auxiliary Power	5	Gas	2	2.00	
Compressor, Air	75	Gas	5	6.00	
Conductor (Sheaves, Insulators, Stringing, Deadending, Clipping and Spacing)					
Truck, Flatbed, w/ Bucket, 5 Ton	235	Diesel	6	8.00	
Tension Machine, Conductor	135	Diesel	2	3.00	
Tension Machine, Static	135	Diesel	1	2.00	
Truck, Wire Puller, 3 Drum	310	Diesel	1	3.00	
Truck, Sock Line, Puller, 3 Drum	310	Diesel	1	2.00	
Truck, Wire Puller, 1 Drum	310	Diesel	1	3.00	
Truck, Semi, Tractor	310	Diesel	2	8.00	
Trailer, Lowboy & Reel Stand	N/A	N/A	8	N/A	
Trailer, Flatbed, 40'	N/A	N/A	2	N/A	
Truck, Water, 2,000 - 5,000 Gal	175	Diesel	1	6.00	37
Crawler, Track Type, w/ Blade (D8 type)	305	Diesel	1	2.00	
Crawler, Track Type, Sagging (D8 type)	305	Diesel	2	2.00	
Truck, Crew Cab, Flatbed, 1 Ton	180	Gas	8	5.00	
Truck, Pick-Up	180	Gas	4	8.00	
Back Hoe, w/ Bucket	85	Diesel	1	2.00	
Truck, Mechanics, 1 - 2 Ton	260	Diesel	1	6.00	
Crane, Hydraulic, Rough Terrain, 35 Ton	125	Diesel	3	3.00	
Helicopter	N/A	Jet Fuel	1	6.00	
Motor, Auxiliary Power	5	Gas	4	2.00	
Cleanup					
Truck, Dump, 10 Ton	235	Diesel	1	4.00	
Excavator, Grade-All	165	Diesel	1	4.00	
Crawler, Track Type, w/ Blade (D6 type)	165	Diesel	1	2.00	
Truck, Semi, Tractor	310	Diesel	1	4.00	
Trailer, Lowboy, 30'	N/A	N/A	1	N/A	3
Motor, Auxiliary Power	5	Gas	1	1.00	
Motor Grader	110	Diesel	1	4.00	
Truck, Flatbed, 1 Ton	210	Diesel	1	6.00	
Truck, Pick-Up	210	Diesel	1	6.00	

Source: SCE– PEA Table 3.4-6 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-19. Proposed Project Construction Equipment Estimates By Activity – Whirlwind Substation

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Grading Element				
980 Loader	350	Diesel	3	8 hrs.
Grader	350	Diesel	2	8 hrs.
Compactor	80	Gas/Diesel	2	6 hrs.
Water Truck	180	Gas/Diesel	3	8 hrs.
Survey Truck	180	Gas/Diesel	1	2 hrs.
Soils Test Crew Truck	180	Gas/Diesel	1	2 hrs.
Civil Element				
Office Trailer	0	Electric	1	8 hrs.
Driller	305	Diesel	2	8 hrs.
Crew Trucks	180	Gas/Diesel	5	2 hrs.
14 Ton Crane	180	Diesel	1	4 hrs.
Dump Trucks	180	Gas/Diesel	3	6 hrs.
Tractors	85	Diesel	2	6 hrs.
5-Ton Truck	180	Gas/Diesel	1	4 hrs.
Forklift	75	Diesel	1	4 hrs.
Ditch Digger	75	Diesel	2	6 hrs.
Electrical Element				
Office Trailer	0	Electric	1	8 hrs.
Manlifts	75	Diesel	4	6 hrs.
Pickup Trucks	180	Gas/Diesel	4	2 hrs.
14-Ton Crane	180	Gas/Diesel	2	6 hrs.
Crew Trucks	180	Gas/Diesel	3	2 hrs.
150-ton Crane	250	Diesel	2	6 hrs.
5-ton truck	180	Gas/Diesel	1	2 hrs.
Forklift	75	Diesel	1	6 hrs.
Carryall Vehicles	180	Gas/Diesel	4	2 hrs.
Support Trucks	180	Gas/Diesel	2	2 hrs.
Transformer Assembly and Processing Element				
Carry-all	180	Gas/Diesel	2	6 hrs.
Manlifts	75	Diesel	2	6 hrs.
Forklift	75	Diesel	1	6 hrs.
50 Ton Crane	200	Diesel	2	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
Processing Trailer	0	Electric	1	8 hrs.
Maintenance Element				
Foreman Truck	180	Gas/Diesel	1	2 hrs.
Manlifts	75	Gas/Diesel	1	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
Gas/Processing Trailer	0	Electric	2	8 hrs.
Test Element				
Pickup Trucks	180	Gas/Diesel	1	2 hrs.

Source: SCE, 2007a – PEA Table 3.4-9 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-20. Proposed Project Construction Equipment Estimates By Activity – Antelope Substation

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Grading Element				
980 Loader	350	Diesel	0	8 hrs.
Grader	350	Diesel	0	8 hrs.
Compactor	80	Gas/Diesel	0	5 hrs.
Water Truck	180	Gas/Diesel	0	8 hrs.
Survey Truck	180	Gas/Diesel	0	2 hrs.

Table 2.2-20. Proposed Project Construction Equipment Estimates By Activity – Antelope Substation				
Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Soils Test Crew Truck	180	Gas/Diesel	0	2 hrs.
Civil Element				
Office Trailer	0	Electric	1	8 hrs.
Driller	305	Diesel	2	8 hrs.
Crew Trucks	180	Gas/Diesel	4	2 hrs.
14 Ton Crane	180	Diesel	1	4 hrs.
Dump Trucks	180	Gas/Diesel	2	6 hrs.
Tractors	85	Diesel	2	6 hrs.
5-Ton Truck	180	Gas/Diesel	1	4 hrs.
Forklift	75	Diesel	1	4 hrs.
Ditch Digger	75	Diesel	1	6 hrs.
Electrical Element				
Office Trailer	0	Electric	1	8 hrs.
Manlifts	75	Diesel	4	6 hrs.
Pickup Trucks	180	Gas/Diesel	4	2 hrs.
14-Ton Crane	180	Gas/Diesel	2	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
150-ton Crane	250	Diesel	2	6 hrs.
5-ton truck	180	Gas/Diesel	1	2 hrs.
Forklift	75	Diesel	1	6 hrs.
Carryall Vehicles	180	Gas/Diesel	4	2 hrs.
Support Trucks	180	Gas/Diesel	2	2 hrs.
Transformer Assembly and Processing Element				
Carry-all	180	Gas/Diesel	2	6 hrs.
Manlifts	75	Diesel	1	6 hrs.
Forklift	75	Diesel	1	6 hrs.
50 Ton Crane	200	Diesel	2	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
Processing Trailer	0	Electric	1	24 hrs.
Maintenance Element				
Foreman Truck	180	Gas/Diesel	1	2 hrs.
Manlifts	75	Gas/Diesel	1	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
Gas/Processing Trailer	0	Electric	2	8 hrs.
Test Element				
Pickup Trucks	180	Gas/Diesel	1	6 hrs.

Source: SCE, 2007a – PEA Table 3.4-10 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-21. Proposed Project Construction Equipment Estimates By Activity – Vincent Substation				
Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Grading Element				
980 Loader	350	Diesel	3	8 hrs.
Grader	350	Diesel	3	8 hrs.
Compactor	80	Gas/Diesel	2	6 hrs.
Water Truck	180	Gas/Diesel	5	8 hrs.
Survey Truck	180	Gas/Diesel	2	2 hrs.
Soils Test Crew Truck	180	Gas/Diesel	1	2 hrs.
Civil Element				
Office Trailer	0	Electric	1	8 hrs.
Driller	305	Diesel	2	8 hrs.
Crew Trucks	180	Gas/Diesel	4	2 hrs.
14 Ton Crane	180	Diesel	1	4 hrs.

Table 2.2-21. Proposed Project Construction Equipment Estimates By Activity – Vincent Substation

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Dump Trucks	180	Gas/Diesel	2	6 hrs.
Tractors	85	Diesel	2	6 hrs.
5-Ton Truck	180	Gas/Diesel	1	4 hrs.
Forklift	75	Diesel	1	4 hrs.
Ditch Digger	75	Diesel	1	6 hrs.
Electrical Element				
Office Trailer	0	Electric	1	8 hrs.
Manlifts	75	Diesel	4	6 hrs.
Pickup Trucks	180	Gas/Diesel	4	2 hrs.
14-Ton Crane	180	Gas/Diesel	2	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
150-ton Crane	250	Diesel	2	6 hrs.
5-ton truck	180	Gas/Diesel	1	2 hrs.
Forklift	75	Diesel	1	6 hrs.
Carryall Vehicles	180	Gas/Diesel	4	2 hrs.
Support Trucks	180	Gas/Diesel	2	2 hrs.
Transformer Assembly and Processing Element				
Carry-all	180	Gas/Diesel	2	6 hrs.
Manlifts	75	Diesel	1	6 hrs.
Forklift	75	Diesel	1	6 hrs.
50 Ton Crane	200	Diesel	2	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
Processing Trailer	0	Electric	1	24 hrs.
Maintenance Element				
Foreman Truck	180	Gas/Diesel	1	2 hrs.
Manlifts	75	Gas/Diesel	1	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
Gas/Processing Trailer	0	Electric	2	8 hrs.
Test Element				
Pickup Trucks	180	Gas/Diesel	1	6 hrs.

Source: SCE, 2007a – PEA Table 3.4-11 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-22. Proposed Project Construction Equipment Estimates By Activity – Gould Substation

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Grading Element				
980 Loader	350	Diesel	0	Grading Element Not Applicable to Construction
Grader	350	Diesel	0	
Compactor	80	Gas/Diesel	0	
Water Truck	180	Gas/Diesel	0	
Survey Truck	180	Gas/Diesel	0	
Soils Test Crew Truck	180	Gas/Diesel	0	
Civil Element				
Office Trailer	0	Electric	1	8 hrs.
Driller	305	Diesel	1	8 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
14 Ton Crane	180	Diesel	1	4 hrs.
Dump Trucks	180	Gas/Diesel	2	6 hrs.
Tractors	85	Diesel	1	6 hrs.
5-Ton Truck	180	Gas/Diesel	1	4 hrs.
Forklift	75	Diesel	1	4 hrs.
Ditch Digger	75	Diesel	1	6 hrs.
Electrical Element				

Table 2.2-22. Proposed Project Construction Equipment Estimates By Activity – Gould Substation

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Office Trailer	0	Electric	1	8 hrs.
Manlifts	75	Diesel	2	6 hrs.
Pickup Trucks	180	Gas/Diesel	1	2 hrs.
14-Ton Crane	180	Gas/Diesel	1	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
150-ton Crane	250	Diesel	1	6 hrs.
5-ton truck	180	Gas/Diesel	1	2 hrs.
Forklift	75	Diesel	1	6 hrs.
Carryall Vehicles	180	Gas/Diesel	2	2 hrs.
Support Trucks	180	Gas/Diesel	1	2 hrs.
Transformer Assembly and Processing Element				
Carry-all	180	Gas/Diesel	0	Transformer Element Not Applicable to Construction
Manlifts	75	Diesel	0	
Forklift	75	Diesel	0	
50 Ton Crane	200	Diesel	0	
Crew Trucks	180	Gas/Diesel	0	
Processing Trailer	0	Electric	0	
Maintenance Element				
Foreman Truck	180	Gas/Diesel	1	2 hrs.
Manlifts	75	Gas/Diesel	1	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
Gas/Processing Trailer	0	Electric	1	8 hrs.
Test Element				
Pickup Trucks	180	Gas/Diesel	1	6 hrs.

Source: SCE, 2007a – PEA Table 3.4-13 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-23. Proposed Project Construction Equipment Estimates By Activity – Mesa Substation

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Grading Element				
980 Loader	350	Diesel	0	Grading Element Not Applicable to Construction
Grader	350	Diesel	0	
Compactor	80	Gas/Diesel	0	
Water Truck	180	Gas/Diesel	0	
Survey Truck	180	Gas/Diesel	0	
Soils Test Crew Truck	180	Gas/Diesel	0	
Civil Element				
Office Trailer	0	Electric	1	8 hrs.
Driller	305	Diesel	1	8 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
14 Ton Crane	180	Diesel	1	4 hrs.
Dump Trucks	180	Gas/Diesel	2	6 hrs.
Tractors	85	Diesel	1	6 hrs.
5-Ton Truck	180	Gas/Diesel	1	4 hrs.
Forklift	75	Diesel	1	4 hrs.
Ditch Digger	75	Diesel	1	6 hrs.
Electrical Element				
Office Trailer	0	Electric	1	8 hrs.
Manlifts	75	Diesel	2	6 hrs.
Pickup Trucks	180	Gas/Diesel	1	2 hrs.
14-Ton Crane	180	Gas/Diesel	1	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.

Table 2.2-23. Proposed Project Construction Equipment Estimates By Activity – Mesa Substation				
Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
150-ton Crane	250	Diesel	1	6 hrs.
5-ton truck	180	Gas/Diesel	1	2 hrs.
Forklift	75	Diesel	1	6 hrs.
Carryall Vehicles	180	Gas/Diesel	2	2 hrs.
Support Trucks	180	Gas/Diesel	1	2 hrs.
Transformer Assembly and Processing Element				
Carry-all	180	Gas/Diesel	0	Transformer Element Not Applicable to Construction
Manlifts	75	Diesel	0	
Forklift	75	Diesel	0	
50 Ton Crane	200	Diesel	0	
Crew Trucks	180	Gas/Diesel	0	
Processing Trailer	0	Electric	0	
Maintenance Element				
Foreman Truck	180	Gas/Diesel	1	2 hrs.
Manlifts	75	Gas/Diesel	1	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
Gas/Processing Trailer	0	Electric	1	8 hrs.
Test Element				
Pickup Trucks	180	Gas/Diesel	1	6 hrs.

Source: SCE, 2007a – PEA Table 3.4-12 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-24. Proposed Project Construction Equipment Estimates By Activity – Mira Loma Substation				
Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Grading Element				
980 Loader	350	Diesel	0	Grading Element Not Applicable to Construction
Grader	350	Diesel	0	
Compactor	80	Gas/Diesel	0	
Water Truck	180	Gas/Diesel	0	
Survey Truck	180	Gas/Diesel	0	
Soils Test Crew Truck	180	Gas/Diesel	0	
Civil Element				
Office Trailer	0	Electric	1	8 hrs.
Driller	305	Diesel	1	8 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
14 Ton Crane	180	Diesel	1	4 hrs.
Dump Trucks	180	Gas/Diesel	2	6 hrs.
Tractors	85	Diesel	1	6 hrs.
5-Ton Truck	180	Gas/Diesel	1	4 hrs.
Forklift	75	Diesel	1	4 hrs.
Ditch Digger	75	Diesel	1	6 hrs.
Electrical Element				
Office Trailer	0	Electric	1	8 hrs.
Mainlifts	75	Diesel	2	6 hrs.
Pickup Trucks	180	Gas/Diesel	1	2 hrs.
14 Ton Crane	180	Gas/Diesel	1	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
150-ton Truck	250	Diesel	1	6 hrs.
5-Ton Truck	180	Gas/Diesel	1	2 hrs.
Forklift	75	Diesel	1	6 hrs.
Carryall Vehicles	180	Gas/Diesel	2	2 hrs.
Support Trucks	180	Gas/Diesel	1	2 hrs.

Table 2.2-24. Proposed Project Construction Equipment Estimates By Activity – Mira Loma Substation

Primary Equipment Description	Estimated Horsepower	Probable Fuel Type	Primary Equipment Quantity	Duration of Use (Hours/Day)
Transformer Assembly and Processing Element				
Carry-all	180	Gas/Diesel	0	Transformer Element Not Applicable to Construction
Manlifts	75	Diesel	0	
Forklift	75	Diesel	0	
50 Ton Crane	200	Diesel	0	
Crew Trucks	180	Gas/Diesel	0	
Processing Trailer	0	Electric	0	
Maintenance Element				
Foreman Truck	180	Gas/Diesel	1	2 hrs.
Manlifts	75	Gas/Diesel	1	6 hrs.
Crew Trucks	180	Gas/Diesel	2	2 hrs.
Gas/Processing Trailer	0	Electric	1	8 hrs.
Test Element				
Pickup Trucks	180	Gas/Diesel	1	6 hrs.

Source: SCE, 2007a – PEA Table 3.4-14 (Updated/corrected as part of EIR/EIS process). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-25. Proposed Project Estimated Workforce Requirements for Substation Construction – Segment 9

Construction Elements	Estimated Workforce					
	Whirlwind	Antelope	Vincent	Mesa	Gould	Mira Loma
Grading Crew	0	8	15	0	0	0
Civil Crew	15	15	25	6	6	10
Electrical Crew	25	25	35	10	10	15
Transformer	0	0	0	0	0	0
Installation Crew	6	6	6	0	0	0
Maintenance Crew	5	5	5	5	3	5
Test Crew	4	4	4	2	2	2
Total Estimated	55	63	100	23	21	32

Source: SCE, 2007a – PEA Table 3.4-15. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-26. Proposed Project Estimate of Construction Waste – Segment 10: New Whirlwind – Windhub500-kV T/L

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Conductor and Shield Wire	28,501	0	28,501
Wood from Cribbing Etc.	36,551	27,911	8,640
Soil/Veg: Footings, Stubs & Crane Pads	448,800	314,160	134,640
Miscellaneous	7,869	0	7,869
Sanitation Waste	45,929	0	45,929

Source: SCE, 2007a – PEA Table 3.8-7. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-27. Proposed Project Estimate of Construction Waste – Segment 4: Cottonwind – Whirlwind 220-kV T/L

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Conductor and Shield Wire	5,965	0	5,965
Wood from Cribbing Etc.	21,000	15,840	5,280
Soil/Veg: Footings, Stubs & Crane Pads	100,000	66,000	34,000
Miscellaneous	2,000	0	2,000
Sanitation Waste	10,000	0	10,000

Source: SCE, 2007a – PEA Table 3.8-1. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-28. Proposed Project Estimate of Construction Waste – Segment 4: ~~Antelope~~Vincent – Whirlwind 220-kV T/L

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Conductor and Shield Wire	27,154	0	27,154
Wood from Cribbing Etc.	24,640	18,480	6,160
Soil/Veg: Footings, Stubs & Crane Pads[3]	400,000	265,000	135,000
Miscellaneous	8,000	0	8,000
Sanitation Waste	45,000	0	10,000

Source: SCE, 2007a – PEA Table 3.8-2. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-29. Proposed Project Estimate of Construction Waste – Segment 5: Antelope – Vincent No. 2 500-kV T/L

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Antelope – Vincent 220-kV T/L Removal			
Foundations			
Concrete (Broken)	583,680	0	583,680
Rebar (Scrap)	9,120	0	9,120
Towers			
Galvanized Angle Iron	885,734	0	885,734
Insulators	64,962	0	64,962
Wire			
Aluminum	265,955	0	265,955
Steel	97,327	0	97,327
OHGW & OPGW	49,757	0	49,757
Antelope – Mesa 220-kV T/L Removal			
Foundations			
Concrete (Broken)	645,120	0	645,120
Rebar (Scrap)	10,080	0	10,080
Towers			
Galvanized Angle Iron	896,450	0	896,450
Insulators	84,024	0	84,024
Wire			
Aluminum	161,486	0	161,486
Steel Core	103,869	0	103,869
OHGW, 1/2" High Strength Steel	97,442	0	97,442
Antelope – Vincent 500-kV T/L Construction			
Wire			
Aluminum	21,679	0	21,679
Steel Core	4,967	0	4,967
OHGW, 1/2" Extra High Strength Steel	916	0	916
OHGW, 96 Fiber	886	0	886
Wood	6,000	0	6,000

Source: SCE, 2007a – PEA Table 3.8-3. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-30. Proposed Project Estimate of Construction Waste – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
~~Vincent-~~Mesa – Vincent 220-kV T/L Removal			
Foundations			
Concrete (Broken)	522,240	0	522,240
Rebar (Scrap)	8,160	0	8,160
Towers			
Galvanized Angle Iron	1,432,770	0	1,432,770
Insulators	85,600	0	85,600
Wire			
Aluminum	348,000	0	348,000
Steel	127,000	0	127,000
OHGW & OPGW	98,000	0	98,000
Gould – Mesa 220-kV T/L Construction			
Wire			
Aluminum	3,000	0	3,000
Steel Core	1,000	0	1,000
OHGW, ½" Extra High Strength Steel	600	0	600
Insulators	6,000	0	6,000
Galvanized Angle Iron	75,000	0	75,000
Insulators	6,000	0	6,000
~~Vincent –~~Gould – Vincent 500-kV T/L Construction			
Wire			
Aluminum	38,000	0	38,000
Steel	8,700	0	8,700
OHGW & OPGW	4,800	0	4,800
Wood	6,000	0	6,000

Source: SCE, 2007a – PEA Table 3.8-8. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-31. Proposed Project Estimate of Construction Waste – Segment 6: Rio Hondo – Vincent No. 2 500-kV T/L

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Wood from Cribbing Etc.[1]	66,500	33,000	33,500
Cardboard Boxing and Crating[2]	5,000	0	5,000
Soil/Veg: Footings, Stubs & Crane Pads[3]	573,317 cu yd	544,651 cu yd	28,666 cu yd
Concrete Foundations[4]	4,079,358	0	4,079,358
Conductor and Shield Wire[5]	2,668,256	0	2,668,256
Lattice Towers[6]	4,020,000	0	4,020,000
Insulators and Miscellaneous Hardware[7]	134,000	0	134,000
Miscellaneous	40,000	0	40,000
Sanitation Waste	53,288	0	53,288

Source: SCE, 2007a – PEA Table 3.8-4. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

1 Wood cribbing attained from the job will be approximately 43,200 pounds (32,400 pounds for LST's and 11,200 pounds for TSP's) calculated as follows: 102 LST's at approx. 40,000 pounds steel per LST x 50,000 pound capacity per truck = 82 loads @ 400 pounds cribbing per truck; 32 TSP's at approx. 35,000 pounds steel per TSP x 40,000 pound capacity per truck = 28 loads @ 400 pounds cribbing per truck. Approximately 75% of the cribbing from the structures will be cut into 24" to 36" lengths for use on the assembly process and retained by the contractor. This leaves approximately 10,800 pounds to go to waste. Wood pallets from the job will be approximately 20 trucks with 15 pallets at 50 pounds each for a total of 15,000 pounds. Wood crates from the job will be approximately 15 trucks with 500 pounds crating each for a total of 7,500 pounds.

2 Cardboard boxing and crating from the job will be approximately 10 trucks with 500 pounds crating each for a total of 5,000 pounds.

3 Considering 95% spoils from foundations, excavation from roads and pads to remain on site: 3.14=PI, 96"=diameter TSP with overbore, 144=inch->foot conv, 35' depth hole, 0.4 weight density = 34 TSP's. 42"=diameter LST with overbore, 16' depth LST hole = 102 LSTs. 185' average length spur roads, 16' wide, 4' deep, 111 total roads estimated. 50' by 50' crane pad, 2' deep, 134 crane pads.

4 = concrete @ 5,300 lbs cu/yd x 42"d x 48"l x 540 removals

5 = (220kV conductor @ 2.51 lbs per foot x 6 conductor x 31.4 miles = 2,496,800 lbs / 50,000 per load = 50 loads)+(220kV shield wire @ .517 lbs per foot x 2 wire x 31.4 miles = 171,500 lbs / 50,000 per load = 4 loads)

6 = (220kV lattice steel @ 30,000 lbs per structure x 134 structures = 4,020,000 lbs / 40,000 per load = 100 loads)

7 = (220kV insulators and misc hardware @ 1000 lbs per structure x 134 structures = 134,000 lbs / 40,000 per load = 4 loads)

Table 2.2-32. Proposed Project Estimate of Construction Waste – Segment 7: Mira Loma – Vincent 500-kV T/L

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Wood from Cribbing Etc.[1]	107,150	58,800	48,350
Cardboard Boxing and Crating[2]	7,500	0	7,500
Soil/Veg: Footings, Stubs & Crane Pads[3]	49,960 cu yd	2,498 cu yd	47,462 cu yd
Concrete Foundations[4]	2,863,876	0	2,863,876
Conductor and Shield Wire[5]	871,674	0	871,674
Lattice Towers[6]	2,325,000	0	2,325,000
Insulators and Miscellaneous Hardware[7]	157,500	0	157,500
Miscellaneous	40,000	0	40,000
Sanitation Waste	43,181	0	43,181

Source: SCE, 2007a – PEA Table 3.8-5. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

1 Wood cribbing attained from the job will be approximately 78,400 pounds (75,600 pounds for LST's and 2,800 pounds for TSP's) calculated as follows: 7 LST's at approx. 123,000 pounds steel per LST x 50,000 pound capacity per truck = 189 loads @ 400 pounds cribbing per truck; TSP's at approx. 130,000 pounds steel per TSP x 40,000 pound capacity per truck = 7 loads @ 400 pounds cribbing per truck. Approximately 75% of the cribbing from the structures will be cut into 24" to 36" lengths for use on the assembly process and retained by the contractor. This leaves approximately 20,200 pounds to go to waste. Wood pallets from the job will be approximately 25 trucks with 15 pallets at 50 pounds each for a total of 18,750 pounds. Wood crates from the job will be approximately 20 trucks with 500 pounds crating each for a total of 10,000 pounds.

2 Cardboard boxing and crating from the job will be approximately 15 trucks with 500 pounds crating each for a total of 7,500 pounds.

3 Considering 95% spoils from foundations, excavation from roads and pads to be removed from site: 3.14=PI, 108"=diameter TSP with overbore, 144=inch->foot conv, 35' depth hole, 0.4 weight density = 2 TSP's. 54"=diameter LST with overbore, 20' depth LST hole = 79 LSTs. 362' length permanent spur roads, 16' wide, 4' deep = 2 estimated. 1,757 length permanent spur roads, 16' wide, surface disturbance only = 10 estimated. 50' by 50' crane pad, 2' deep = 2 estimated.

4 = concrete @ 5,300 lbs cu/yd x 36"d x 48"l x 516 removals.

5 = (220kV conductor @ 1.33 lbs per foot x 6 conductor x 16.32 miles = 687,600 lbs / 50,000 per load = 14 loads)+(220kV shield wire @ .517 lbs per foot x 1 wire x 16.32 miles = 44,550 lbs / 50,000 per load = 1 load)+(66kV conductor @ .463 lbs per foot x 6 conductor x 9.51 miles = 139,491 lbs / 50,000 lbs per load = 3 loads)

6 = (220kV lattice steel @ 20,000 lbs per structure x 75 structures = 1,500,000 lbs / 40,000 per load = 38 loads)+(66kV lattice steel @ 15,000 lbs per structure x 1 wire x 55 structures = 825,000 lbs / 40,000 per load = 21 loads)

7 = (220kV insulators and misc hardware @ 1000 lbs per structure x 75 structures = 75,000 lbs / 40,000 per load = 2 loads)+(66kV insulators and misc hardware @ 1,500 lbs per structure x 55 structures = 82,500 lbs / 40,000 per load = 2 loads)

Table 2.2-33. Proposed Project Estimate of Construction Waste – Segment 8: New Mira Loma – Vincent 500-kV T/L

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Wood from Cribbing Etc.[1]	207,160	155,370	51,790
Cardboard Boxing and Crating[2]	7,500	0	7,500
Soil/Veg: Footings, Stubs & Crane Pads[3]	536,028 cu yd	26,801 cu yd	509,226 cu yd
Concrete Foundations[4]	3,514,476	0	3,514,476
Conductor and Shield Wire[5]	2,564,441	0	2,564,441
Lattice Towers[6]	2,516,977	0	2,516,977
Insulators and Miscellaneous Hardware[7]	317,500	0	317,500
Miscellaneous	60,000	0	60,000
Sanitation Waste	73,500	0	73,500

Source: SCE, 2007a – PEA Table 3.8-6. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

1 Wood cribbing attained from the job will be approximately 207,160 pounds (131,320 pounds for LST's and 75,840 pounds for TSP's) calculated as follows: 7 LST's at approx. 140,000 pounds steel per LST and 63 LST's at approx. 45,000 pounds steel per LST x 50,000 pound capacity per truck = 328 loads @ 400 pounds cribbing per truck; 0 TSP's at approx. 126,000 pounds steel per TSP x 40,000 pound capacity per truck = 189 loads @ 400 pounds cribbing per truck. Approximately 75% of the cribbing from the structures will be cut into 24" to 36" lengths for use on the assembly process and retained by the contractor. This leaves approximately 51,790 pounds to go to waste. Wood pallets from the job will be approximately 40 trucks with 15 pallets at 50 pounds each for a total of 30,000 pounds. Wood crates from the job will be approximately 30 trucks with 500 pounds crating each for a total of 15,000 pounds.

2 Cardboard boxing and crating from the job will be approximately 25 trucks with 500 pounds crating each for a total of 12,500 pounds.

3 Considering 95% spoils from foundations, excavation from roads and pads to be removed from site: 3.14=PI, 108"=diameter 500-TSP with overbore, 144=inch->foot conv, 35' depth hole, 0.4 weight density = 60 TSP's. 54"=diameter 500-LST with overbore, 20' depth LST hole = 97 LST's., plus 36"=diameter 220-LST with overbore, 18' depth LST hole = 63 LST's. 8,212' length permanent spur roads, 16' wide, 2' deep = 29 new spur roads estimated. 23,979 length permanent spur roads, 16' wide, surface disturbance only = 60 estimated. 50' by 50' crane pad, 2' deep = 40 estimated (utilizing existing pads at all locations practicable).

4 = concrete @ 5,300 lbs cu/yd x 36"d x 48"l x 420 removals (105-220kv dc lst); + 30"d x 48"l x 92 removals (23-220kv sc lst); + 24"d x 48"l x 36 removals (9-66kv dc lst); + 60"d x 48"l x 48 removals (23-220kv dc tsp)

5 = (220kV conductor @ 1.33 lbs per foot x 12 conductor x 26.55 miles)+(6 conductor x 1.88 miles)+(3 conductor x 5.37 miles)+(66kV conductor @ .463 lbs per foot x 6 conductor x 1.60 miles = 2,453,146 lbs / 50,000 lbs per load = 49 loads)+(220kV shield wire @ .517 lbs per foot x 1 wire x 28.43 miles)+(2 wire x 5.37 miles)+(66kV shield wire @ 0.517 lbs per foot x 1 wire x 1.60 miles = 279,432 lbs / 50,000 per load = 6 loads)

6 = (220kV lattice steel @ 20,000 lbs per structure x 105 structures)+(220kV lattice steel @ 12,000 lbs per structure x 23 structures)+(220kV double tube pole structure @ 60,000 lbs per structure x 23 structures)+(66kV lattice steel @ 9,000 lbs per structure x 9 structures = 3837000 lbs / 40,000 per load = 96 loads)

7 = (220kV insulators and misc hardware @ 2000 lbs per structure x 152 structures)+(66kV insulators and misc hardware @ 1,500 lbs per structure x 9 structures = 317,500 lbs / 40,000 per load = 8 loads)

Table 2.2-34. Proposed Project Estimate of Construction Wastes – Whirlwind Substation				
~~Gould~~ Whirlwind Substation	Waste Item	Cubic Yards	Cubic Yards Reusable on Site	Cubic Yards Recyclable or Disposed
Grading Element	Soil/Vegetation	272,000 ~~115,000~~	270,000 ~~100,000~~	2,000 ~~15,000~~
	Sanitation Waste	20 ~~70~~	0	20 ~~70~~
	Miscellaneous	40 ~~500~~	0	40 ~~500~~
Civil Element	Soil	40,000 ~~2,400~~	3,000 ~~2,400~~	37,000 ~~0~~
	Wood	40 ~~2,000~~	0	40 ~~2,000~~
	Concrete	50 ~~90~~	0	50 ~~90~~
	Sanitation Waste	20 ~~70~~	0	20 ~~70~~
	Miscellaneous	80 ~~1,000~~	0	80 ~~1,000~~
Electrical Element	Wood	160 ~~1,500~~	0	160 ~~1,500~~
	Aluminum	40 ~~160~~	0	40 ~~160~~
	Copper	30	0	30
	Steel	10 ~~40~~	0	10 ~~40~~
	Sanitation Waste	20 ~~70~~	0	20 ~~70~~
	Miscellaneous	120 ~~500~~	0	120 ~~500~~

Source: SCE, 2007a – PEA Table 3.8-9; Updated per SCE, 2009d. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-35. Proposed Project Estimate of Construction Wastes – Antelope Substation				
~~Gould~~ Antelope Substation	Waste Item	Cubic Yards	Cubic Yards Reusable on Site	Cubic Yards Recyclable or Disposed
Grading Element	Soil/Vegetation	5,500	5,000	500
	Sanitation Waste	70	0	70
	Miscellaneous	500	0	500
Civil Element	Soil	1,800	1,800	0
	Wood	80	0	80
	Concrete	20	0	20
	Sanitation Waste	70	0	70
	Miscellaneous	400	0	400
Electrical Element	Wood	120	0	120
	Aluminum	10	0	10
	Copper	10	0	10
	Steel	5	0	5
	Sanitation Waste	70	0	70
	Miscellaneous	10	0	10

Source: SCE, 2007a – PEA Table 3.8-10. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-36. Proposed Project Estimate of Construction Wastes – Vincent Substation				
~~Gould~~ Vincent Substation	Waste Item	Cubic Yards	Cubic Yards Reusable on Site	Cubic Yards Recyclable or Disposed
Grading Element	Soil/Vegetation	60,000~~80,000~~	55,000~~74,000~~	5,000~~6,000~~
	Sanitation Waste	70	0	70
	Miscellaneous	500	0	500
Civil Element	Soil	4,000	4,000	0
	Wood	3,000	0	3,000
	Concrete	500	0	500
	Sanitation Waste	70	0	70
	Miscellaneous	1,000	0	1,000
Electrical Element	Wood	2,500	0	2,500
	Aluminum	1,500	0	1,500
	Copper	800	0	800
	Steel	2,000	0	2,000
	Sanitation Waste	70	0	70
	Miscellaneous	500	0	500

Source: SCE, 2007a – PEA Table 3.8-11. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-37. Proposed Project Estimate of Construction Wastes - Gould Substation				
Gould Substation	Waste Item	Cubic Yards	Cubic Yards Reusable on Site	Cubic Yards Recyclable or Disposed
Grading Element	Soil/Vegetation	0	0	0
	Sanitation Waste	0	0	0
	Miscellaneous	0	0	0
Civil Element	Soil	100	100	0
	Wood	20	0	20
	Concrete	10	0	10
	Sanitation Waste	1	0	1
	Miscellaneous	1	0	1
Electrical Element	Wood	5	0	5
	Aluminum	2	0	2
	Copper	1	0	1
	Steel	5	0	5
	Sanitation Waste	1	0	1
	Miscellaneous	1	0	1

Source: SCE, 2007a – PEA Table 3.8-13. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-38. Proposed Project Estimate of Construction Wastes – Mesa Substation				
~~Could~~ Mesa Substation	Waste Item	Cubic Yards	Cubic Yards Reusable on Site	Cubic Yards Recyclable or Disposed
Grading Element	Soil/Vegetation	0	0	0
	Sanitation Waste	0	0	0
	Miscellaneous	0	0	0
Civil Element	Soil	15	15	0
	Wood	20	0	20
	Concrete	5	0	5
	Sanitation Waste	1	0	1
	Miscellaneous	1	0	1
Electrical Element	Wood	10	0	10
	Aluminum	2	0	2
	Copper	2	0	2
	Steel	20	0	20
	Sanitation Waste	1	0	1
	Miscellaneous	1	0	1

Source: SCE, 2007a – PEA Table 3.8-12. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-39. Proposed Project Estimate of Construction Wastes – Mira Loma Substation				
Mira Loma Substation	Waste Item	Cubic Yards	Cubic Yards Reusable on Site	Cubic Yards Recyclable or Disposed
Grading Element	Soil/Vegetation	0	0	0
	Sanitation Waste	0	0	0
	Miscellaneous	0	0	0
Civil Element	Soil	175	175	0
	Wood	30	0	30
	Concrete	10	0	10
	Sanitation Waste	3	0	3
	Miscellaneous	3	0	3
Electrical Element	Wood	40	0	40
	Aluminum	2	0	2
	Copper	1	0	1
	Steel	5	0	5
	Sanitation Waste	3	0	3
	Miscellaneous	3	0	3

Source: SCE, 2007a – PEA Table 3.8-14. Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Table 2.2-40. Proposed Project Helicopter Staging Areas for Construction of Towers Within the ANF		
Site #	Location (Proximity to the T/L)	Description of Site (Ownership / Existing Conditions / Accessibility)
SCE#0	Adjacent to Beartrap Canyon, south of Aliso Canyon Road, and approximately 0.45 mile east of S11 MP 3.9	Located off~~on~~ NFS land. Site is just south of Aliso Canyon Rd, 2.5 miles northwest of the junction with Angeles Forest Highway. The area proposed for use includes a disturbed upland and an adjacent slope. All or part of the upland may have been used for agriculture in the past. It now supports a mix of native and non-native species that are recolonizing since the site was last cleared. Common species are annual ragweed, one or more mustard species, and a few scattered native shrubs. The adjacent slope is below the upland and facing southwest. The sloped area represents more than half of the site and is covered by chaparral that appears to have burned in the last ca. five years. Native vegetation on the slope includes chamise, bush poppy, yerba santa, and other native shrubs.
SCE#1	Along north side of Mt. Gleason Road, approximately 0.3 mile east of S11 MP 7.6	Located on NFS land. Site is north of Forest Road 3N17 and ~~west~~ east of the junction with Forest Road 4N24. The area includes mature chaparral, a stand of rabbitbrush scrub, and a disturbed roadside turnout. Chaparral occupies the western half of the site and is dominated by manzanita and oaks. Rabbitbrush scrub occupies the eastern half of the site and is dominated by rabbitbrush and yerba santa. The disturbed area is forty feet square, at the junction of Forest Road 4N24. Manzanitas present on this site could possibly be San Gabriel Manzanita (CNPS List 1B.2); however, positive identification cannot occur at this time of year (November 2008).
SCE#2	Along and south of Forest Road 3N27, immediately west of S11 MP 9.3 near Structure #36	Located on NFS land. Site is off Forest Road 3N27, 1.3 miles south of the junction with Forest Road 3N17. It is situated on a south-facing ridgeline, and the road crosses it along the contours of the east and west-facing slopes. Except for the road, the site is covered by chaparral, dominated by oaks, manzanitas, and chamise. ~~Much of this site is inaccessible due to the s~~Steep slopes are located both above and below the road. A new road would need to be built to allow access to the site.
SCE#3	Along and north of Forest Road 3N27, west of S11 MP 10.75	Located on NFS land. Site is off Forest Road 3N27, approximately 2.3 miles south-southwest of the junction with Forest Road 3N17. The site is situated on a ridgeline above the road, which wraps around the slope just below. ~~The site itself is inaccessible due to steep topography and surrounding steep road cut.~~ Vegetation is chaparral as described above for SCE#2. A new road would need to be built to allow access to the site.
SCE#3B	Terraced area near Big Tujunga Dam approximately 0.15 mile west-southwest of Big Tujunga Canyon Road and,S11 MP 14.5	Located on NFS lands. Site is a currently disturbed area, located on the plateau on top of a benched and graded hillside. The plateau is bounded to the east by Big Tujunga Canyon Road, to the north by a steep rocky slope, to the south by vegetated hills, and open space to the west (where the benched hillside stretches down into Big Tujunga Canyon). Direct access provided via Big Tujunga Canyon Road, which would be temporarily closed during helicopter operations.
SCE#4	Adjacent to and west of Mt Lukens Road (Forest Road 2N76.3), Angeles Crest Station, and S11 MP 18.0	Located off NFS lands. Site is off Forest Road 2N76.3, about 0.75 mile west of Angeles Crest Highway. This site is apparently on private land and is in use as an apiary (dozens of active hives within a fenced area). The entire site is covered by perennial grassland (dominated by *Elymus*) with a few scattered native shrubs including elderberry and oaks. The surrounding slopes are covered with chaparral shrubs. The site appears to have been scraped in the past and probably seeded with grasses.
SCE#5	Along Forest Road 2N69 just north of Gould Substation and west of S11 MP 18.6	Located off NFS lands. Site is east of Angeles Crest Highway at the Gould substation. The majority of the site is chaparral (dominated by oaks, chamise, and laurel sumac). There is a large cleared area near the center of the site that has only sparse, weedy plant cover and there is a dense stand of Spanish broom at the roadside. There is no potential for rare species within the disturbed portion of the site.
SCE#6	West of Shortcut Station adjacent to Upper Big Tujunga Canyon Road (Forest Road 3N19), approximately 0.35 mile west of S6 MP 16.5	Located on NFS lands. The site is on an unnamed road behind the Shortcut Fire Station near the upper end of Upper Big Tujunga Road, approximately 0.6 mile northeast of the junction with Angeles Crest Highway. Roughly half of the site is developed with two small reservoirs, a small building, a large open storage area and the access road. The remainder of the site, southeast of the developed area, is covered by chaparral (dominated by manzanita, oaks, and chamise). There are also scattered Coulter pines throughout the site. Much of the site has apparently been thinned for brush clearance in the past year, but much of the chaparral is still dense. No rare species were observed.

Table 2.2-40. Proposed Project Helicopter Staging Areas for Construction of Towers Within the ANF		
Site #	Location (Proximity to the T/L)	Description of Site (Ownership / Existing Conditions / Accessibility)
SCE#6B	Barley Flats (former US Air Force Nike missile site), 0.5 mile north of Angeles ~~Forest~~ Crest Hwy and 1.75 miles west-NW of intersection with Upper Big Tujunga Canyon Rd, approximately 1.8 miles west of S6 MP 16.75	[Same as Alternative 6 Site #7] Located on NFS lands. This is a split site which includes an existing helipad (operated and maintained by the Los Angeles County Sheriff's Department) located to the south of Barley Flats Road, used in conjunction with a portion of the former US Air Force Nike missile site known as "Barley Flats". The Barley Flats area encompasses two lots located at the western end of Barley Flats Road; because the western lot is currently occupied by numerous abandoned buildings which may have potential for Historical designation, only the eastern lot is included as part of this helicopter staging site. No existing structures in the western lot would be removed. The eastern lot of Barley Flats, as included in this split site, is currently bordered to the west by several small abandoned structures, to the north by mature natural-growth trees, to the east by what appears to be an abandoned stormwater detention basin, and to the south by an earth embankment and another abandoned structure (possibly an old office). The existing entrance to this lot is located in the southwestern corner. The Los Angeles County Sheriff's helipad that would be used in conjunction with the eastern Barley Flats lot is considered large enough to accommodate the sky crane required for helicopter construction. The helipad area is surrounded by mature trees, some of which may need to be removed to land the sky crane. Use of this site as a helicopter staging area would include helicopters and a sky crane landing at the helipad, with tower laydown and assembly taking place at the eastern Barley Flats lot. Access provided via Barley Flats Road, which is accessed from Angeles Crest Highway (approximately 300 feet west of Upper Big Tujunga Canyon Road). Barley Flats Road is just over three miles long, heading in a west-northwest direction towards the proposed helicopter site. Barley Flats Rd is currently gated at Angeles Crest Highway.
SCE#7	Adjacent to Rincon-Redbox Road in the Newcomb Pass area, approximately 0.36 mile west of junction with Shortcut-Edison Road , just west of S6 MP 19.5	[Same as Alternative 6 Site #9] Located on NFS lands. Site is a currently disturbed area used by Forest Service fire personnel as a helicopter landing site. Site is relatively flat and in some areas supports large populations of nonnative grasses and Spanish broom. Mature oaks and potential spotted owl habitat surround the site. Native vegetation has recruited in many areas and includes California buckwheat, ceanothus, and manzanita. A small depression occurs near the middle of the site which collects seasonal rainfall. This area supports wetland plant species such as spikerush. Several recreational trails cross or pass near to the site, and are used extensively by recreationists during the summer months. Access to the site is via two points along Rincon-Redbox Road just west of the intersection with Shortcut-Edison Road.
SCE#8	West of Van Tassel Road, north of Duarte, west of S6 MP 26	[Same as Alternative 6 Site #11] Located on NFS lands. Site is adjacent to Forest Road 1N36, about 0.5 mile southwest of Mount Bliss. Roughly half of the site is disturbed due to the road, a dirt turnout, and a water tower. The remaining half is covered by native vegetation. A knoll near the center is covered by coastal sage scrub (dominated by California buckwheat and black sage), surrounded on all sides are chaparral (dominated by manzanita, ceanothus, and laurel sumac). There is a woodland of California bay laurel and canyon live oak immediately north of the site. *Quercus durata* var. *gabrielensis* (CNPS List 4.2) is present on the site. There is no potential for rare species in the disturbed portion of the site.
SCE#9	Fish Canyon Rifle Range, 1.2 miles east of S7 MP 0.6 accessed via Fish Canyon Road in Azusa	Located off NFS lands. Site is at the end of Fish Canyon Road near the mouth of Fish Canyon. It is on an abandoned gun club shooting range. The site is entirely disturbed and is covered almost entirely by concrete. There is a small area of bare soils where the actual firing range was that is sparsely covered by non-native *Pennisetum* and a few native weedy annual plants. There is no potential for rare plants on this site.
SCE#10	Southwest of Cogswell Reservoir, accessed via Highway 39, San Gabriel Canyon Road	Located on NFS lands. The site is located just southwest of the Cogswell Reservoir dam on FS road 2N25. This area has been previously disturbed as part of the construction of Cogswell Reservoir. It consists of Cogswell Main and Cogswell Annex, two open graded areas at the top of a fill slope that was apparently created by placing sediment from the reservoir into a side canyon. The site is accessed by a paved, switchback road that climbs the steep fill slope. The fill slope and the site at the top have apparently been seeded with a variety of native species, dominated by California buckwheat (*Eriogonum fasciculatum*). Various nonnative annual grasses and forbs are also present. The site is surrounded by native vegetation, and San Gabriel scrub oak was found present adjacent to the site. An unidentified mariposa lily, possibly Plummer's mariposa lily, was also observed adjacent to the site.

Note: Site numbers correspond to those shown in Figure 2.2-83.

Table 2.2-41. Roads in the ANF to be Utilized by the Proposed Project		
Forest System #	Forest System Name	Length (miles)
Paved Roads – potential maintenance/reconstruction required		
N/A	Angeles Forest Highway	21.5
N/A	Tujunga Canyon Road	2.6
N/A	Upper Big Tujunga Road	9.1
N/A	Angeles Crest Highway	16.5
N/A	Aliso Canyon Road	5.2
N/A	Barley Flats Road	3.0
N/A	Maple Canyon	0.7
N/A	West Fork Road	7.4
N/A	Santa Clara Divide/Mount Gleason Road	9.6
2N65.2	Chaney Trail	0.6
3N19A	Shortcut Station	0.2
		Subtotal = 76.3 miles
ANF Unpaved System Roads – maintenance/reconstruction required		
1N36	Van Tassel	3.3
2N23	Shortcut Edison	8.9
2N24.2	Rincon/Redbox	5.1
2N24.3	Rincon/Redbox	1.6
2N25.2	WestFork/Cogswell	5.3
2N30.1	Sawpit	3.1
2N45.3	Mount Wilson/Henninger Flats	0.3
2N75	CCC Ridge	0.6
2N76.3	Mount Lukens	0.4
2N79.1	Grizzly Flat	0.7
3N20	Powerline Road	2.6
3N23	Monte Cristo	1.6
3N27	Edison/Fall Creek	13.3
4N18.1	Lynx Gulch	6.2
4N18.2	Lynx Gulch	3.7
4N24.1	Edison	7.1
4N24.2	Edison	1.9
		Subtotal = 65.5 miles
ANF Unpaved Non-System Roads – maintenance/reconstruction required		
N/A	Non-FS roads	36.3
		Subtotal = 36.3 miles
Total		178.1 miles

Table 2.2-42. Alternative 2 (SCE's Proposed Project) Helicopter Trip Estimate

Structure Type (Activity)	Number of Structures in ANF Using Helicopters	Minimum Helicopter Round Trips Per Tower	Maximum Helicopter Round Trips per Tower	Total Minimum Helicopter Round Trips	Total Maximum Helicopter Round Trips
Segment 6	17				
220-kV Suspension (Wreck Out) [1]	17	55	89	935	1,513
220-kV Dead End (Wreck Out)	0	64	105	0	0
500-kV Suspension (Construct)	17	146	194	2,482	3,298
500-kV Dead End (Construct)	0	380	480	0	0
Total Helicopter Round Trips Segment 6 =				3,417	4,811
Segment 11	16				
220-kV Suspension (Wreck Out) [1]	16	55	89	880	1,424
220-kV Dead End (Wreck Out)	0	64	105	0	0
500-kV Suspension (Construct)	16	146	194	2,336	3,104
500-kV Dead End (Construct)	0	380	480	0	0
Total Helicopter Round Trips Segment 11 =				3,216	4,528
TOTAL Helicopter Round Trips (Segments 6 & 11) =				6,633	9,339

Source: SCE, 2008a; SCE, 2008c (DR#5 - Q14).

[1] Wreck out towers assumed to be one-for-one with replaced towers.

Table 2.2-43. Proposed Project Construction Schedule

TRTP Segment	Duration[1]	Start	Finish
Marshalling Yards	2 Months	December 2009	January 2010
Segment 4 – Whirlwind 500/220-kV Transmission Elements	25~~1~~ Months	~~July~~ December 2009	~~April~~ December 2011
Segment 6 – New Replacement Rio Hondo – Vincent No. 2 Transmission Line	28~~33~~ Months	~~July 2009~~ October 2010	~~April 2012~~ January 2013
Segment 7 – New Mira Loma – Vincent 500-kV Transmission Line	40~~28~~ Months	~~July 2009~~ February 2010	~~November 2011~~ May 2013
Segment 8 – New Mira Loma – Vincent 500-kV Transmission Line	47~~33~~ Months	~~July 2009~~ February 2010	~~April 2012~~ December 2013
Segment 5 – Antelope – Vincent No. 2 500-kV Transmission Line	27~~1~~ Months	~~July~~ December 2009	~~April 2011~~ February 2012
Segment 10 – New Whirlwind – Windhub 500-kV Transmission Line	17~~8~~ Months	~~February 2011~~ April 2010	~~October~~ August 2011
Segment 11 – New Mesa – Vincent (via Gould) 500/220-kV Transmission Line	49~~19~~ Months	~~April 2012~~ October 2010	~~November 2013~~ October 2014
Segment 9 – Substation Facilities	45 Months	February 2010	November 2013
• Whirlwind Substation	19~~3~~ Months	~~July~~May 2010	~~August~~December 2011
• Antelope Substation	45 Months	February 2010	November 2013
• Vincent Substation	40~~5~~ Months	~~February~~June 2010	November 2013
• Other Substations (Gould, Chino, ~~Mesa,~~ Mira Loma)	25 Months	October 2011	November 2013

Source: SCE, 2007a – PEA Table 3.9-1; SCE, 2009d, DR#8: Q7-22-Revised 8/27/2009 (updated all segments except "Other Substations"). ~~Durations and start dates for some components have been amended to delay the start of construction from what was reported in the PEA (April 2009) to July 2009, as the decision on the Project is not anticipated from the CPUC until late June 2009.~~ Note: Durations and dates provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

[1] Duration based on estimated number of work days to complete the project. Work days are generally Monday-Friday from 7:00 a.m. to 5:00 p.m.

Table 2.2-44. Scenic Integrity Objectives and Definitions	
Scenic integrity Objective	Definition of Scenic Integrity Levels
Very High	Landscapes where the valued character "is" intact with only minute if any visual deviations. The existing landscape character is expressed at the highest possible level.
High	Landscapes where the valued landscape character "appears" intact. Visual deviations (human-made structures) may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident.
Moderate	Landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
Low	Landscapes where the valued landscape character "appears moderately altered." Visual deviations (human-made structures) begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. They should not only appear as valued character outside the landscape being viewed but compatible or complementary to the character within.
Very Low	Landscapes where the valued landscape character "appears heavily altered." Visual deviations (human-made structures) may strongly dominate the valued landscape character. They may not borrow from valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles within or outside the landscape being viewed. However, visual deviations (human-made structures) must be shaped and blended with the natural terrain (landforms) so that elements such as unnatural edges, roads, landings, and structures do not dominate the composition.
For Inventory and Scenic Effect Prediction Purposes Only	
Unacceptably Low [1]	A scenic integrity level (never an objective) where human activities of vegetation and landform alterations or human-made structures are excessive and totally dominate the natural or natural-appearing landscape character. Landscapes where the valued landscape character being viewed appears extremely altered. Visual deviations are extremely dominant and borrow little if any form, line, color, texture pattern or scale from the natural landscape character. Landscapes of this level of integrity need rehabilitation. Unacceptable alterations are "what not to do to any landscape," regardless of the distance from which the activity may be observed.

Source: USDA, 1995.

[1] According to the SMS, there is a level of landscape alteration that is excessive, where deviations are extremely dominant. This level of scenic integrity is to be used for inventory purposes only – it must not be used as a management objective. This level of scenic integrity, "Unacceptably Low Scenic Integrity" or "Unacceptably Altered," is useful for inventorying existing facilities, and for predicting future scenic integrity of proposed projects and activities.

Table 2.2-45. Scenic Integrity Objectives by Mile for Alternative 2 (SCE's Proposed Project)		
Mile Post	SIO	Definition
Segment 11 MP 1.5 to 6.8 MP 6.9 to 8.7 MP 9.9 to 11.3 MP 11.5 to 15.2 MP 15.3 to 19.7 MP 19.8 to 24.5	High	Landscapes where the valued landscape character "appears" intact. Visual deviations (human-made structures) may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident.
Segment 11 MP 6.8 to 6.9 MP 8.7 to 9.9 MP 11.3 to 11.5 MP 15.2 to 15.3 MP 19.7 to 19.8	Moderate	Landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.
Segment 6 MP 1.4 to 10.6 MP 10.8 to 12.1 MP 12.3 to 13.5 MP 13.6 to 26.9	High	Landscapes where the valued landscape character "appears" intact. Visual deviations (human-made structures) may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident.

Table 2.2-45. Scenic Integrity Objectives by Mile for Alternative 2 (SCE's Proposed Project)		
Mile Post	SIO	Definition
Segment 6 MP 10.6 to 10.8 MP 12.1 to 12.3 MP 13.5 to 13.6	Moderate	Landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.

Table 2.2-46. Inconsistencies with Established Scenic Integrity Objectives ~~Amendments to~~of the 2005 Forest Plan for Alternative 2 (SCE's Proposed Project)	
~~Forest Plan~~ Project Elements	Inconsistencies with Established Scenic Integrity Objective (SIO)
Alternative 2 SCE's Proposed Project (~~Changes required inside rights of way in ANF f~~For Segments 11 and 6 within the ANF)	Segment 11: *~~High SIO changed to~~An Unacceptably Low Level of Scenic Integrity would occur in an area designated as High SIO for a total of 10.45 miles (A drop of 4 Levels)* (from MP 1.5 to 2.25, MP 3.0 to 4.25, MP 11.5 to 14.75, MP 19.2 to 19.7, and MP 19.8 to 24.5) *~~High SIO changed to~~A Very Low SIO would occur in an area designated as High SIO for a total of 3.4 miles (A drop of 3 Levels)* (from MP 4.75 to 6.8 and MP 6.9 to 8.25) *~~High SIO changed to~~A Low SIO would occur in an area designated as High SIO for a total of 6.2 miles (A drop of 2 Levels)* (from MP 8.25 to 8.7, MP 9.9 to 11.3, MP 14.75 to 15.2, and MP 15.3 to 19.2) *~~High SIO changed to~~A Moderate SIO would occur in an area designated as High SIO for a total of 0.75 miles (A drop of 1 Level)* (from MP 2.25 to 3.0) ~~1~~ *~~Moderate SIO changed to~~An Unacceptably Low Level of Scenic Integrity would occur in an area designated as Moderate SIO for a total of 0.1 mile (A drop of 4 Levels)* (from MP 19.7 to 19.8) *~~Moderate SIO changed to~~A Very Low SIO would occur in an area designated as Moderate SIO for a total of 0.1 mile (A drop of 3 Levels)* (from MP 6.8 to 6.9) *~~Moderate SIO changed to~~A Low SIO would occur in an area designated as Moderate SIO for a total of 1.5 miles (A drop of 2 Levels)* (from MP 8.7 to 9.9, MP 11.3 to 11.5, and MP 15.2 to 15.3) ~~1~~ *Total in Segment 11 = 22.5 miles* Segment 6: *~~High SIO changed to~~An Unacceptably Low Level of Scenic Integrity would occur in an area designated as High SIO for a total of 11.0 miles (A drop of 4 Levels)* (from MP 1.4 to 8.0, MP 13.1 to 13.5, and MP 13.6 to 17.6) *~~High SIO changed to~~A Very Low SIO would occur in an area designated as High SIO for a total of 3.7 miles (A drop of 3 Levels)* (from MP 8.0 to 10.6, MP 10.8 to 11.5, and MP 17.6 to 18.0) *~~High SIO changed to~~A Low SIO would occur in an area designated as High SIO for a total of 6.6 miles (A drop of 2 Levels)* (from MP 11.5 to 12.1, MP 12.3 to 13.1, MP 19.0 to 21.4, and MP 24.1 to 26.9) *~~High SIO changed to~~A Moderate SIO would occur in an area designated as High SIO for a total of 3.7 miles (A drop of 1 Level)* (from MP 18.0 to 19.0 and MP 21.4 to 24.1) ~~1~~ *~~Moderate SIO changed to~~An Unacceptably Low Level of Scenic Integrity would occur in an area designated as Moderate SIO for a total of 0.1 mile (A drop of 4 Levels)* (from MP 13.5 to 13.6) *~~Moderate SIO changed to~~A Very Low SIO would occur in an area designated as Moderate SIO for a total of 0.2 mile (A drop of 3 Levels)* (from MP 10.6 to 10.8) *~~Moderate SIO changed to~~A Low SIO would occur in an area designated as Moderate SIO for a total of 0.2 mile (A drop of 2 Levels)* (from MP 12.1 to 12.3) ~~1~~ *Total in Segment 6 = 25.5 miles* TOTAL IN SEGMENTS 6 AND 11 = 48.0 MILES

Note: It is predicted that the proposed Project (Alternative 2) would achieve the Very Low SIO in areas designated as Moderate SIO for Segments 11 and 6 because topographic screening would not hide these tall new T/L structures.

[1] The Forest Supervisor may approve a project in the ANF ~~that would lower the Scenic Integrity Objectives level~~ without a Forest Plan amendment, as long as the SIO decrease would not be greater than one SIO level (for instance if a project would achieve a Moderate SIO in an area designated for a High SIO).

The following Forest-specific Design Criteria and Place-specific Standards are applicable to the Project:

- ANF S1 - Pacific Crest Trail - Protect scenic integrity of foreground views as well as from designated viewpoints. Where practicable, avoid establishing nonconforming land uses within the viewshed of the trail (Liebre-Sawmill, Santa Clara Canyons, Soledad Front Country and Angeles High Country). (p. 76)
- S9: Design management activities to meet the Scenic Integrity Objectives (SIOs) shown on the Scenic Integrity Objectives Map.
- S10: Scenic Integrity Objectives will be met with the following exceptions: (1) Minor adjustments not-to-exceed a drop of one SIO level is allowable with the Forest Supervisor's approval. (2) Temporary drops of more than one SIO level may be made during and immediately following project implementation providing they do not exceed three years in duration.

Table 2.2-47. RCA Crossing Points Summary – Alternative 2 (SCE's Proposed Project)

Drainage Type	Crossing Type	Total	Non-conformity to Forest Plan
ROAD CROSSINGS			
Perennial	Arizona	2	2
	Paved Arizona	2	2
	Washout	1	1
Intermittent	Arizona	44	35
	Paved Arizona	8	3
	CMP	12	6
	Concrete Culvert	1	1
Ephemeral	Arizona	84	38
	Paved Arizona	4	2
	CMP	12	5
	Concrete Culvert	1	0
	Subtotal	171	95
LINE CROSSINGS*			
Perennial	N/A	7	0
Intermittent	N/A	63	0
Ephemeral	N/A	26	0
	Subtotal	96	0
	Total	267	95

*Line crossings were determined by aerial photography.

*Line crossings were determined by aerial photography and are indicated as such in Figure 3.4-6 (located in the Map & Figure Series Volume).

ALTERNATIVE 3

(WEST LANCASTER)

FIGURE

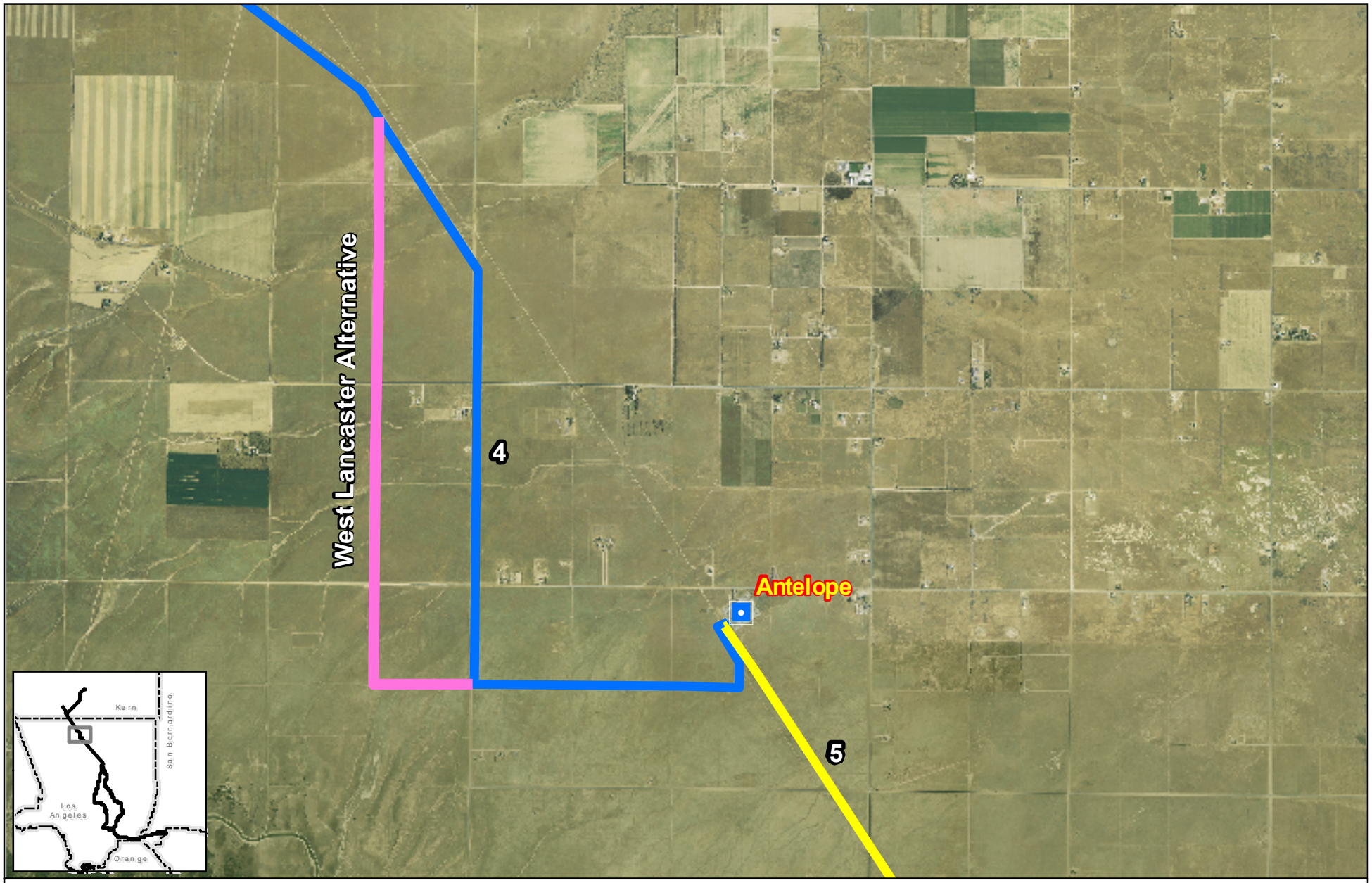


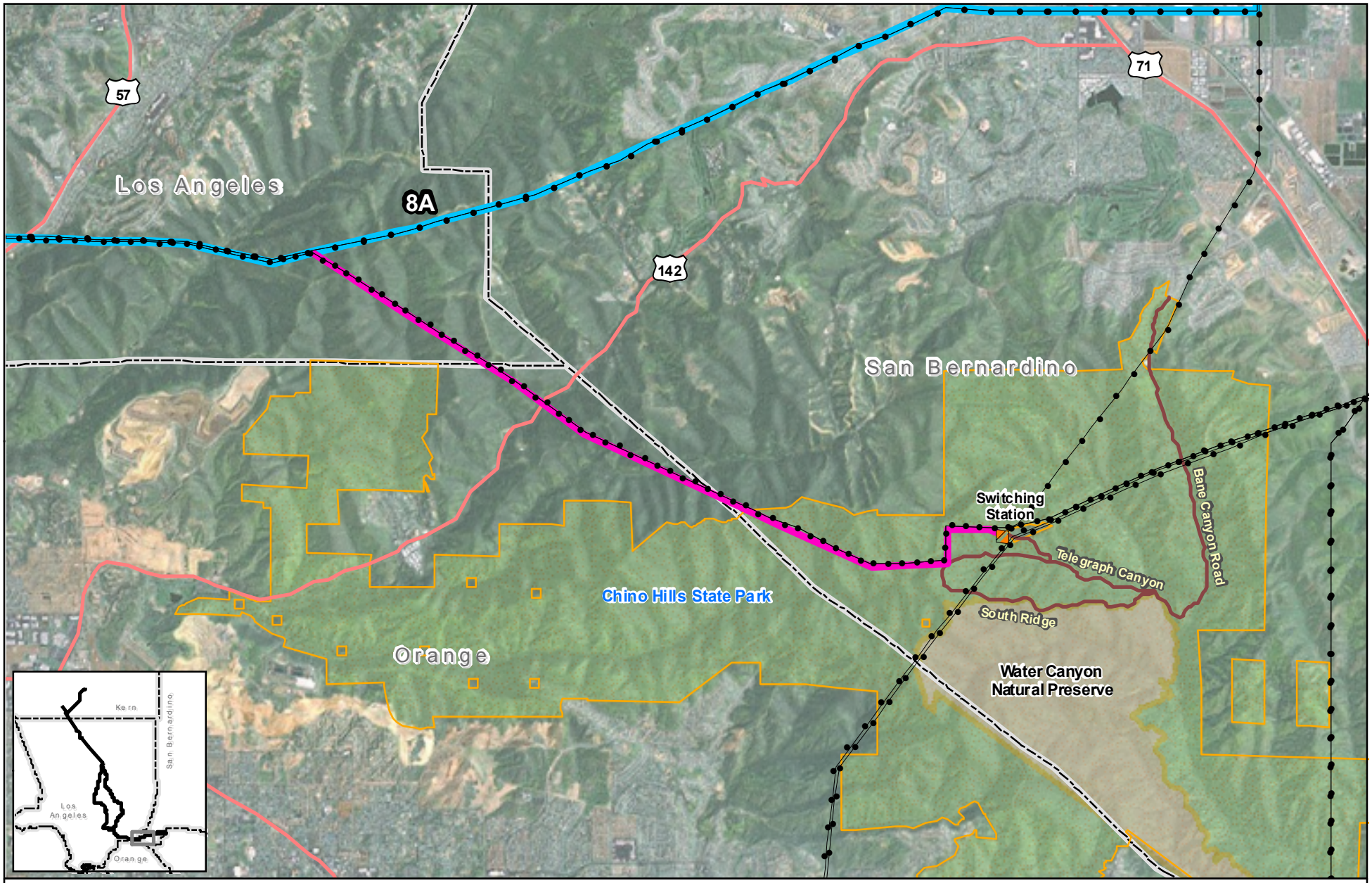
Figure 2.3-1

West Lancaster Alternative

ALTERNATIVE 4

(CHINO HILLS ROUTES)

FIGURES



Aspen Environmental Group

Figure 2.4-1 (Revised)

Chino Hills Route A Alternative

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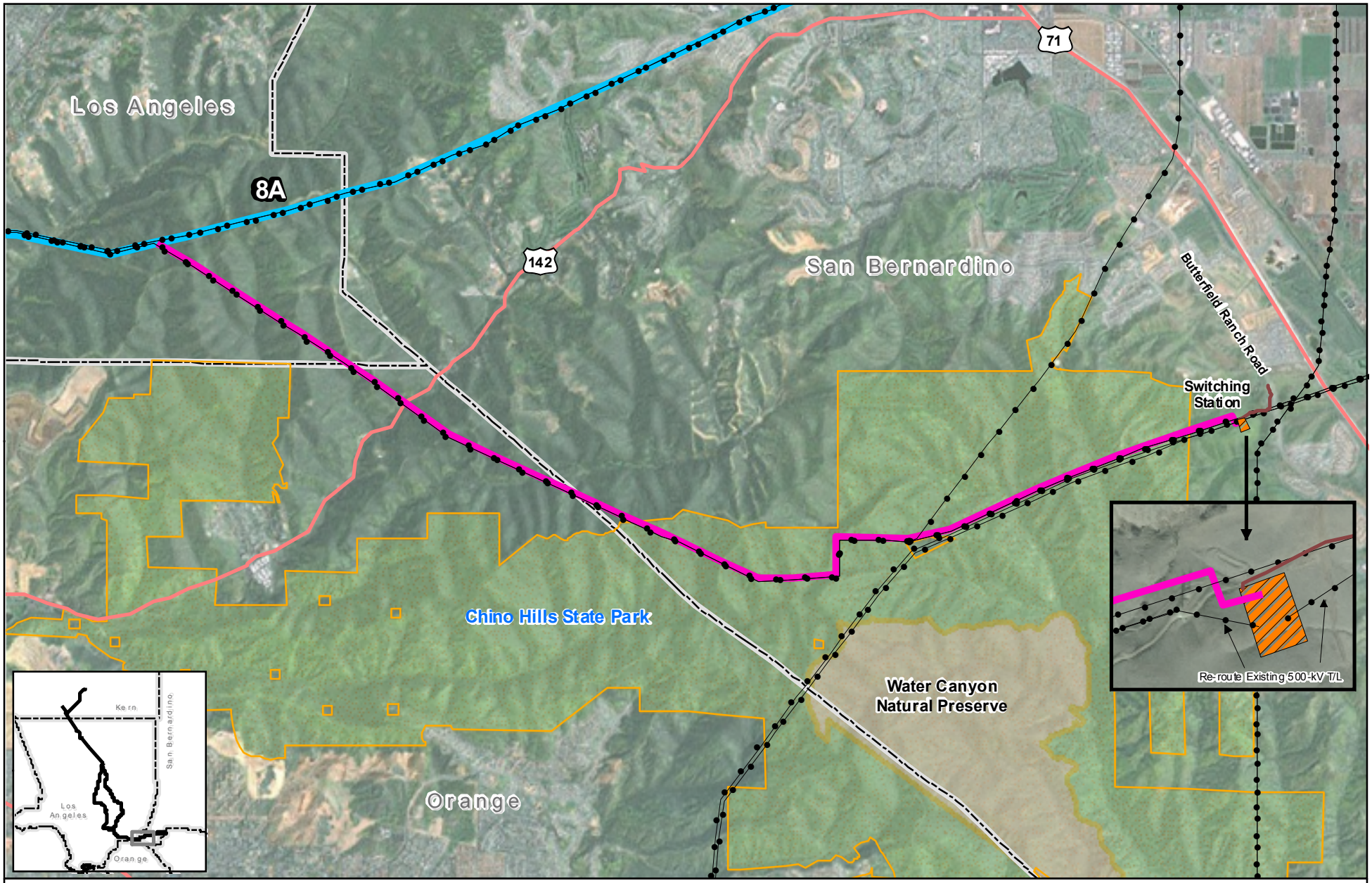
Figure 2.4-1a (New)

Example of Gas-Insulated Switchgear Technology, Rancho Vista Substation



Aspen Environmental Group

Figure 2.4-2 (Revised)

Chino Hills Route B Alternative

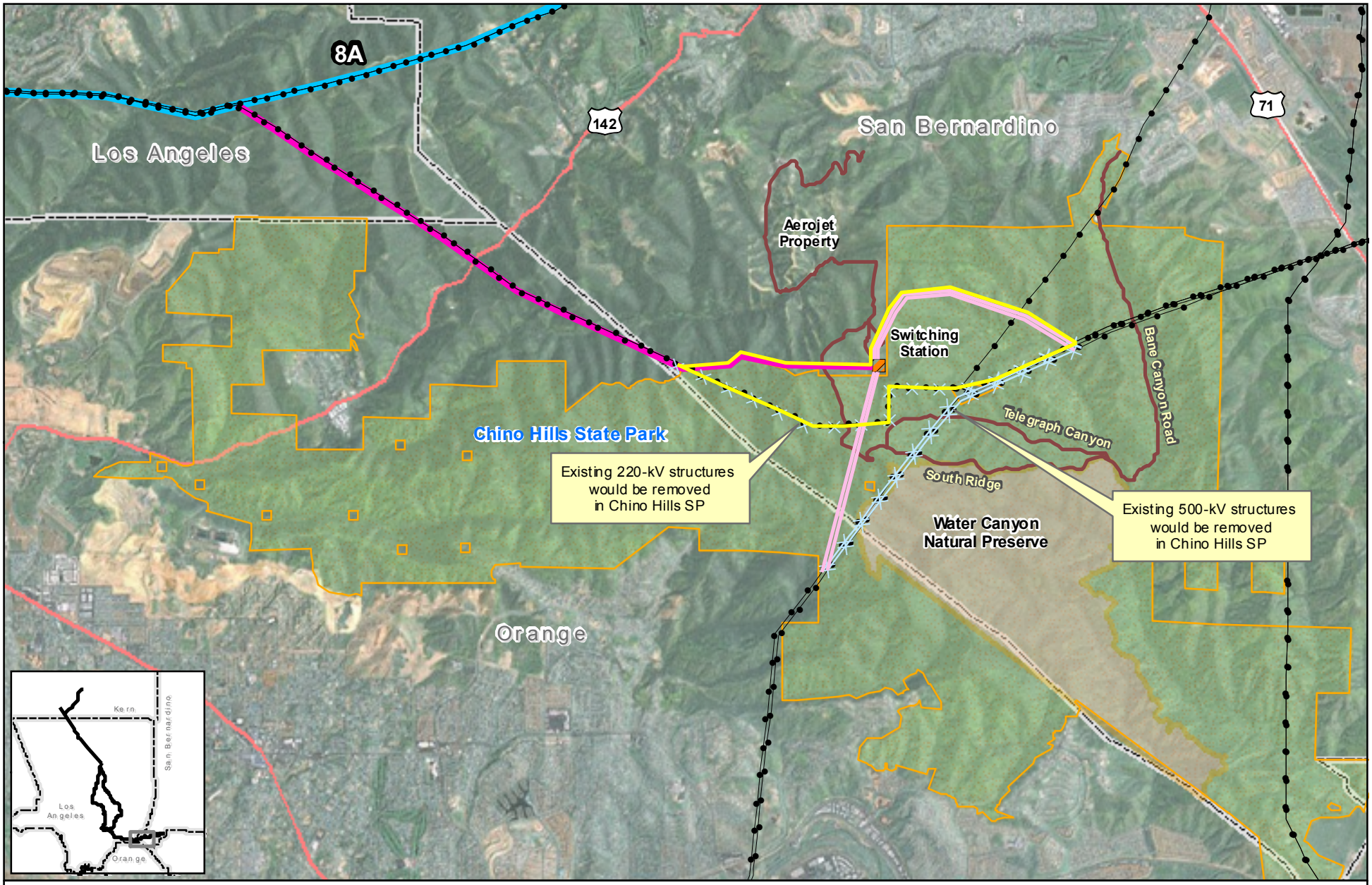


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Figure 2.4-3 (Revised)

Chino Hills Route C Alternative

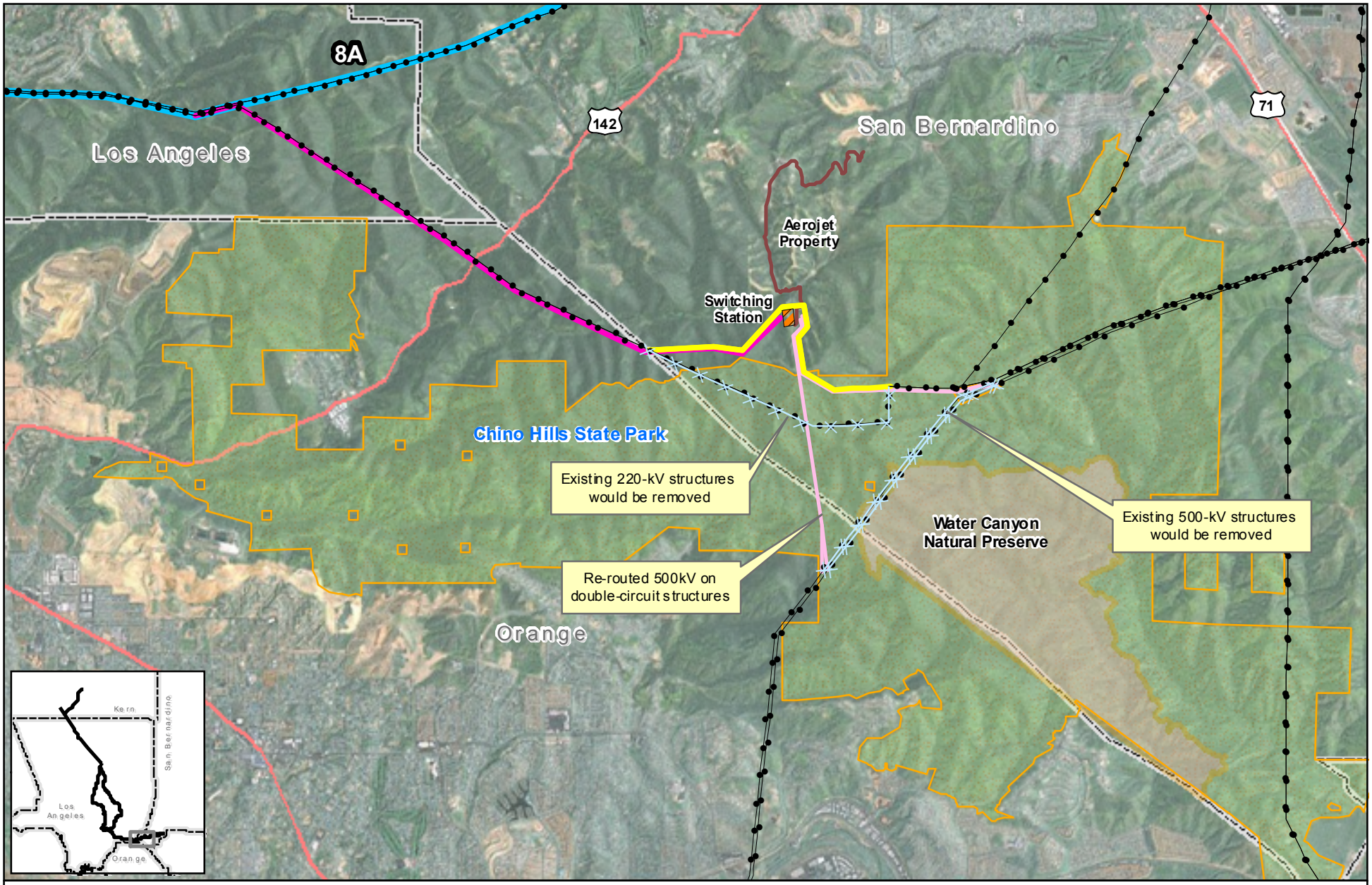

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Figure 2.4-3a (New)

Chino Hills Route C Modified Alternative

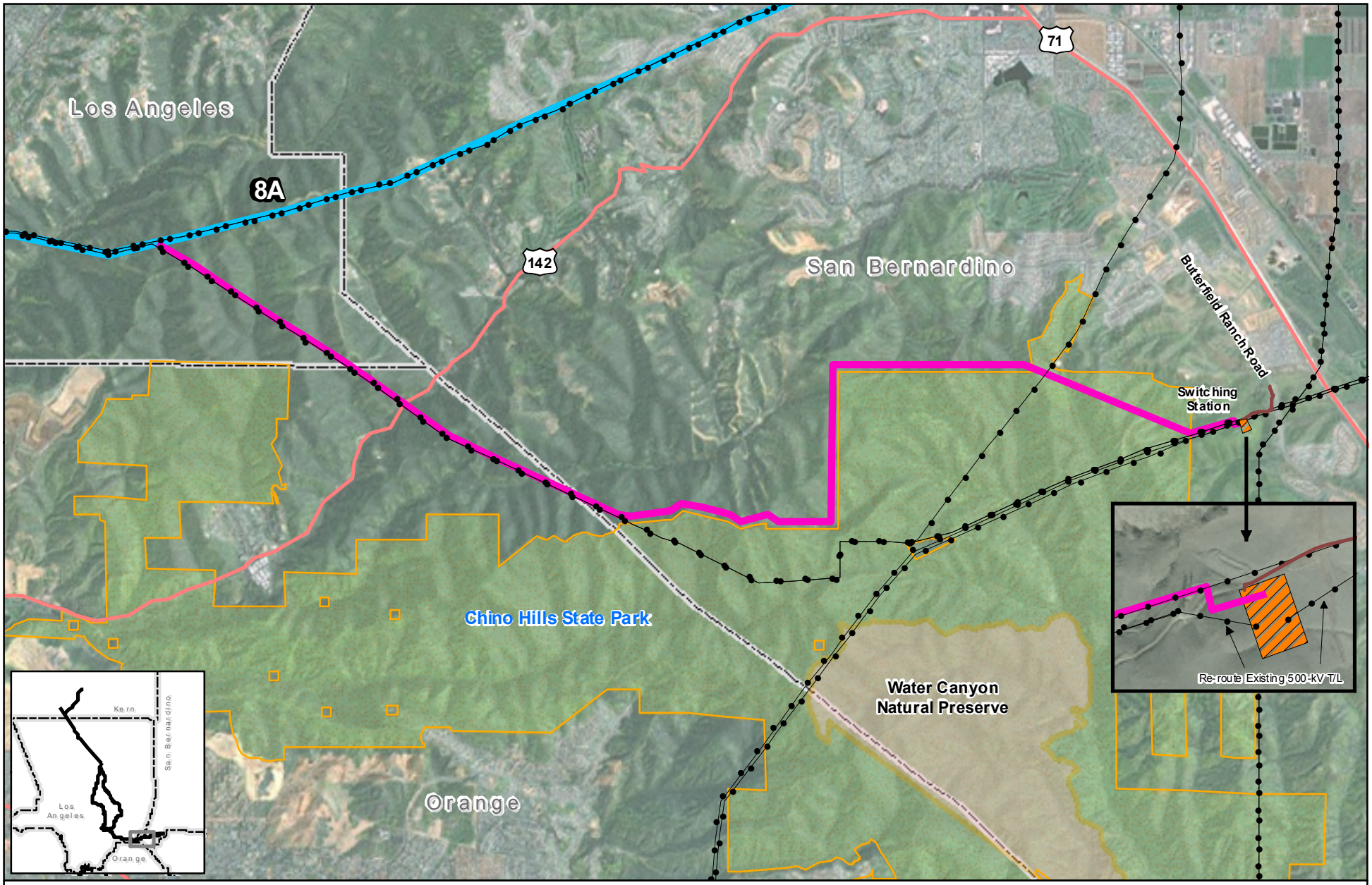

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Figure 2.4-4 (Revised)

Chino Hills Route D Alternative

ALTERNATIVE 4

(CHINO HILLS ROUTES)

TABLES

Table 2.4-1 Alternative 4A (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
CM and Inspection	5	5 - pickup trucks	6.5
Marshalling Yards	6	2 - forklifts 1 - RT crane 2 - pickup truck 1 - flatbed truck 1 - tractor truck 1 - flatbed trailer 1 - office trailer 1 - portable generator	6.5
Survey	2	1 - pickup truck	2.25
Road Work/Structure Pads	3	1 - dozer, track type, w/blade 1 - excavator, grade-all 1 - road grader 1 - water truck 1 - pickup truck 1 - tractor truck 1 - lowboy trailer 2 - 10-yard dump truck 1 - crew cab flatbed truck	2.25
Guard Poles	4	1 - pickup truck 1 - crew cab pickup truck 1 - pole truck and trailer 2 - bucket trucks 1 - drill rig 1 - backhoe w/bucket 1 - RT crane	0.5
Wreck Out Conductors, Structures and Foundations	8	2 - flatbed trucks w/bucket 1 - flatbed trucks w/boom 1 - pickup truck 2 - crew cab pickup trucks 1 - tension machine 1 - 3 drum puller 1 - tractor truck 2 - flatbed trailer 1 - lowboy trailer 1 - dozer, track type, w/blade 1 - backhoe w/ concrete hammer 1 - 150/300 ton crane 1 - water truck 1 - 2 T mechanics truck	1
Foundation Installation	16	1 - pickup truck 2 - crew cab pickup trucks 1 - flatbed truck 2 - drill rigs 1 - backhoe w/bucket 1 - dozer, w/ blade (D6 type) 1 - boom trucks 1 - excavator, grade-all 1 - tractor truck 1 - lowboy trailer 1 - water truck 1 - 2 T mechanics truck 2 - portable generators 1 - 10-yard dump truck 2 - storage trailers	2.25

Table 2.4-1 Alternative 4A (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
		4 - concrete trucks	
Tower Hauling/Assembly/Erection	64	4 - pickup trucks 1 - 2 1/2 ton flatbed truck 10 - crew cab pickup trucks 2 - tractor trucks 4 - flatbed trailers 5 - air compressors 1 - water truck 2 - portable generators 2 - 150/300 ton crane 1 - 2 T mechanics truck 4 - RT cranes	4.25
Conductor Operations	28	3 - pickup trucks 5 - crew cab pickup trucks 2 - RT cranes 6 - bucket trucks 1 - backhoe w/bucket 1 - conductor tensioner 1 - static tensioner 1 - sockline puller 1 - conductor puller 1 - sagging dozer 1 - dozer, w/ blade 6 - reel stand trailers 2 - tractor trucks 2 - flatbed trailers 1 - helicopter 4 - portable generators 1 - 2 T mechanics truck 1 - water truck	3
Cleanup	3	1 - pickup truck 1 - crew cab pickup truck 1 - road grader 1 - dozer 1 - excavator, grade-all 1 - tractor truck 1 - lowboy trailer 1 - portable generator 1 - 10-yard dump truck	2.5
TOTAL MANPOWER:	139		

Source: SCE, 2008b – DR#4: Q4-16 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). Note: Numbers provided herein are preliminary and subject to change based on final engineering.

Note: Typical construction operations for this project will work through the area performing the major tasks in a progressive manner. First will be the installation of a new 220kV SC lattice dead-end structure in the Chino-Mesa 220kV SC transmission line that is currently idle. This will move the idle line out of the immediate area and make room for the new installation work at this junction. The new structure M24-T1 will be installed approximately 200 feet north of new structure M57-T4. Followed by the relocation of a Mira Loma-Villa Park #2 220kV DE structure in the area of the new switching station to make room for the new station work. This structure will be moved north approximately 365 feet. Following will be the removal of the old foundations and the filling and leveling of exposed foundation holes. At the same time, surveying of the structure sites, and laying out and building of any road and structure pads along the line will start. This will be followed by the staking of new structure locations, digging of foundation holes and the installing of foundations for the structures. As these operations proceed the hauling and laying out of structure steel and the subsequent assembly and erection of the structures takes place. After all the structures are set in a given section, the installation of the conductors, shield wires and communication cables takes place. As the crews finish the main portion of the work they will start work on the re-routing of the existing Mira Loma-Serrano 500kV SC and Lugo-Serrano 500kV SC lines in the vicinity of the new switching station area. This work will include the removal of existing structures, and installing new dead-end structures in the area of the new switching station, cutting the line, and entering into the new switching station from the east and south sides. Following all the installation work, the guard pole crossing structures will be removed and final cleanup of the ROW and construction areas will take place. The number of vehicles and the duration they will be traveling through the area is dependent on the availability to access the ROW from the various roads in the area. While construction likely will be completed in the general time frames indicated, construction vehicles may be utilizing the roads through these areas for longer periods to access structure sites.

Table 2.4-1a Alternative 4 (Segment 8B) Construction Equipment and Workforce Estimates By Activity – Segment 8B: New 220-kV Double-Circuit T/L (Chino Substation to Mira Loma Substation)

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
Construction Inspection	5	5 - pickup trucks	6
Marshalling Yards	3	2 - forklifts 1 - RT crane 1 - crew cab flatbed truck 1 - flatbed truck 1 - tractor truck 3 - flatbed trailers 1 - office trailer 1 - portable generator	6
Survey	3	1 - pickup truck	2
Road Work	2	1 - excavator, grade-all 1 - road grader 1 - water truck 1 - pickup truck 1 - 10-yard dump truck 1 - crew cab flatbed truck	1.25
Guard Poles _	6	1 - crew cab pickup truck 1 - pole truck and trailer 1 - bucket trucks 1 - boom truck 1 - drill rig 1 - backhoe w/bucket 1 - RT crane	2
Wreck Out Conductors, Structures and Foundations	29	4 - flatbed trucks w/bucket 2 - pickup trucks 5 - crew cab pickup trucks 1 - wire takeup puller 1 - 3 drum puller 2 - tractor trucks 4 - flatbed trailers 2 - lowboy trailers 1 - dozer, track type, w/blade 1 - backhoe w/ concrete hammer 1 - 100/150 ton crane 2 - RT cranes 1 - 2 T mechanics truck 1 - 10-yard dump truck 2 - portable generators	2.25
Foundation Installation	13	2 - pickup trucks 3 - crew cab pickup trucks 1 - flatbed truck 2 - drill rigs 1 - backhoe w/bucket 1 - boom truck 1 - excavator, grade-all 1 - tractor truck 1 - lowboy trailer 1 - water truck 1 - 2 T mechanics truck 2 - portable generators 1 - 10-yard dump truck 2 - storage trailers 3 - concrete trucks	2.25
Tower Hauling/Assembly/Erection	57	4 - pickup trucks 1 - 2 1/2 ton flatbed truck 10 - crew cab pickup trucks 1 - tractor truck 3 - flatbed trailers 3 - air compressors	2.5

Table 2.4-1a Alternative 4 (Segment 8B) Construction Equipment and Workforce Estimates By Activity – Segment 8B: New 220-kV Double-Circuit T/L (Chino Substation to Mira Loma Substation)

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
		1 - portable generator 1 - 150/200 ton crane 3 - RT cranes	
Conductor Operations	27	4 - pickup trucks 6 - crew cab pickup trucks 2 - RT cranes 3 - bucket trucks 1 - backhoe w/bucket 1 - conductor tensioner 1 - wire puller, 3 drum 1 - static tensioner 1 - sockline puller 1 - conductor puller 1 - sagging dozer 1 - dozer, w/ blade 6 - reel stand trailers 1 - water truck 2 - tractor trucks 1 - 2 T mechanics truck 2 - flatbed trailers 2 - portable generators	2.5
Cleanup	5	1 - pickup truck 1 - crew cab pickup truck 1 - road grader 1 - excavator, grade-all 1 - tractor truck 1 - lowboy trailer 1 - portable generator 1 - 10-yard dump truck	1
TOTAL MANPOWER:	150		

Source: SCE, 2009h – DR#9: Q3(c).

Table 2.4-2. Alternative 4A Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Segment 8A MP 2.2 to 19.2 (point of deviation from Alternative 2)					
Guard Pole Hole [1] (qty street crossings on quad maps)	21	P/4(28"/12)**2x6 locs *1.5	0.02	0.02	0
Guard Pole Truck Disturbance [1] (same above)	21	2 tracks x10'x2'x6 locs	0.12	0.12	0
Tower Sites (Tower wreck-out only) (Newly disturbed area only) [2]	11	(150' X 150')/2	2.84	2.84	0
TSP Foundation Holes [3] (qty TSP)	0	=PI()*((108"/2)^2)	0	0	0
TSP Pole Hole Truck Disturbance [3] (same above)	0	2 tracks x20'x2'	0	0	0
LST Footing Holes [3] (qty LST)	142	=PI()*((54"/2)^2)	0.04	0	0.04
LST Footings Truck Disturbance [3] (same above)	142	2 tracks x20'x2'x4 locs	1.04	1.04	0
LST and TSP Laydown and Assembly Area [3] (varies)	142	varies	112.74	112.74	0
Crane Pad for Erection [4] (qty structures)	33	50' X 50'	1.89	1.89	0
Wire Stringing Areas (pulling/tensioning/splicing)[2] (qty setups) <overlap demolition/new>	20	varies	36.21	36.21	0

Table 2.4-2. Alternative 4A Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Roads New Access (qty miles) [2]	0	L X 16' wide	0	0	0
Roads New Spur (qty miles) [2]	4	L X 16' wide	7.76	0	7.76
Roads Existing, <impacted areas of roads only> (qty miles) [2]	24	L X 16' wide	46.55	46.55	0
Radius from access road to spur road [2] (# Spur Roads Total)	52	50' R requires 1464 sq. ft.	1.75	0	1.75
Spur Rd Related Temp Disturbed Areas[2]	18	566 sq. ft per spur road	0.234	0.234	0
Additional Spur Rd Radius for TSP and LST haul Trucks [2]	12	2285 sq. ft. per spur road	0.63	0.63	0
Staging Areas for Materials and Equipment [5]	2	3-5 acres per yard	10	10	0
Total Estimated Land Disturbance S8A MP 2.2 to 19.2			221.82	212.27	9.55
Chino Hills Route A from S8A MP 19.2 to New Switching Station in Chino Hills State Park					
Guard Pole Hole [6] (estimated qty main road crossings)	4	P/4(28"/12)**2x6 locs *1.5	0.004	0.004	0
Guard Pole Truck Damage [7] (same above)	4	2 tracks x10'x2'x6 locs	0.022	0.022	0
TSP Foundation Holes [8] (qty TSP)	3	=PI()*((108"/2)^2)	0.003	0	0.003
TSP Pole Hole Truck Damage [9] (same above)	3	2 tracks x20'x2'	0.006	0.006	0
LST Footing Holes [10] (qty LST)	100	=PI()*((60"/2)^2)	0.036	0	0.036
LST Laydown and Assembly Area [11] (varies)	24	See note 11	23.244	23.244	0
Crane Pad for Erection (approx qty structures with slope)	24	40' X 50'	1.102	1.102	0
Wire Stringing Areas (pulling/tensioning/splicing)[15,16] (qty setups) <overlap demolition/new>	13	See notes 15 and 16	16.758	16.758	0
Roads New Access (qty miles)	1.11	L X 16' wide	2.153	0	2.153
Roads New Spur (qty miles) [14]	6.1	L X 16' wide	11.830	0	11.830
Roads Existing, <impacted areas of roads only> (qty miles)	18.07	L X 16' wide	35.045	35.045	0
Radius from access road to spur road (# Spur Roads Total)	20	50' R requires 1464 sq. ft.	0.672	0	0.672
Spur Rd Related Temp Disturbed Areas [12]	15	566 sq. ft per spur road	0.195	0.195	0
Additional Spur Rd Radius for LST haul Trucks [13]	15	2285 sq. ft. per spur road	0.787	0.787	0
Staging Areas for Materials and Equipment	1	3-5 acres per yard	5.000	5.000	0
Total Estimated Land Disturbance for Rerouted Portion of Alt 4A			96.857	82.162	14.695
Switching Station	1	10 acres temp 4-5 acres perm	10.00	5.00	5.00
Segment 8B - Chino Substation to Mira Loma Substation					
Guard Pole Hole [6] (estimated qty main road crossings)	27	P/4(28"/12)**2x6 locs *1.5	0.024	0.024	0
Guard Pole Truck Damage [7] (same above)	27	2 tracks x20'x2'x6 locs	0.298	0.298	0

Table 2.4-2. Alternative 4A Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
LST Footing Holes (qty LST) TAN structures	22	=PI()*((48"/2)^2)	0.006	0	0.006
LST Footing Holes (qty LST) DE structures	15	=PI()*((60"/2)^2)	0.004	0	0.004
LST Laydown and Assembly Area	37	Varies	33.173	33.173	0
Crane Pad for Erection (approx qty structures with slope)	0	50' X 60'	0	0	0
Radius from access road to spur road (# Spur Roads Total)	15	50' R requires 1464 sq. ft.	0.504	0	0.504
Access Rd Related Temp Disturbed Areas [12]	15	566 sq. ft per spur road	0.195	0.195	0
Additional Access Rd Radius for LST Haul Trucks [13]	20	2285 sq. ft. per spur road	1.049	1.049	0
Wire Stringing Areas (pulling/tensioning/splicing) (qty setups) <overlap demolition/new>	7	Varies	10.79	10.79	0
Roads New Access (qty miles)	1.18	L X 16' wide	2.288	0	2.288
Roads Existing, <impacted areas of roads only> (qty miles)	3.31	L X 16' wide	6.419	6.419	0
Staging Areas for Materials and Equipment	1	10 acres	10.000	10.000	0
Total Estimated Land Disturbance for Segment 8B			64.75	61.95	2.80
Total Estimated Land Disturbance Alternative 4A (Seg 8A+8B)			~~328.68~~ 393.43	~~299.44~~ 361.38	~~29.24~~ 32.05
LAND DISTURBANCE RANGE (±20%)			~~262.9 – 394.4~~ 314.7 – 472.1	~~239.6 – 359.3~~ 289.1 – 433.7	~~23.4 – 35.1~~ 25.6 – 38.5

Source: SCE, 2008b – DR#4: Q4-15 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). SCE, 2009h: Q3(b) for Segment 8B. For S8A MP 2.2 to 19.2, based on Table 2.2-9 (Alternative 2) – updated for Alternative 4D. New assumptions are provided below and footnoted in the table. All applicable previous assumptions are footnoted in Table 2.2-9 (above). Note: Numbers provided herein are preliminary and subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Estimated 49 street crossings between S8A MP 19.2 and 35.2 (Segments 8A, 8B, and 8C), which would not require guard structures due to re-route through CHSP (70 - 49 = 21).

2 Ratio from PEA based on mileage change [33 miles (Segment 8 starts at MP 2.2) vs. 19.2 miles].

3 SCE stated in DR#4: Q4-12 that 78 double-circuit structures (18 LSTs and 60 TSPs) would be eliminated from Segment 8 for Alternative 4.

4 Ratio number of crane pads by totally laydown/assembly areas (50 x 142/220)

5 Assume 2 staging area for first 19.2 miles of Segment 8.

6 Guard pole-assume three guard poles per each side of road = 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 20% more crossings present.

7 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

8 TSP-assume 108" dia x 35' depth with overbore for concrete backfill.

9 TSP-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to one location per TSP approx. 20" from stub road.

10 LST-assume 54" dia x 20" depth with overbore for concrete backfill.

11 TSP structure layout, assembly and erection dimensions vary due to quantity of structures to be worked on located within immediate vicinity: =(175*200*2)+(200*200*22)+(250*250*1).

12 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2).

13 Difference between 80' radius and 80' radius from access to spur road for access by 80' trailer bed truck.

14 Spur road is required when access road is over 50' from structure site.

[15] Setups site dimension vary due to terrain, industrial and commercial areas, with approx. 40% of a 200' x 400' site being disturbed: =(100*200*1)+(100*350*2)+(100*400*2)+(200*200*2)+(200*400*6).

[16] Approximately every 7,500' and at points of inflection or DE structures when convenient.

Note: In addition to the 21 new DC 500-kV lattice structures, the re-route work at the new switching station site includes the replacing of 1 existing SC 220-kV dead-end lattice structure with 1 SC 220-kV 3-pole steel dead-end structure; the relocation of 2 existing SC 500-kV dead-end lattice structures; and the installation of 2 new SC 500-kV dead-end lattice structures outside the switching station area, all which are included as part of this project work. Also will be the replacing of a 220-kV lattice structure at the junction at the start of the line with another 220-kV lattice dead-end structure to move the wires out of the way for the new 500-kV wires and structures.

Table 2.4-3. Alternative 4A (S8A MP 19.2 to Switching Station) Estimate of Construction Waste – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Wood from Cribbing Etc.[1]	35,300 lbs	17,100 lbs	18,200 lbs
Cardboard Boxing[2]	5,000 lbs	0 lbs	5,000 lbs
Soil, Vegetation, and Crane Pads[3]	22,789 cu yd	21,649 cu yd	1,139 cu yd
Concrete Foundations[4]	23,588 lbs	0 lbs	23,588 lbs
Conductor and Shield Wire[5]	25,621 lbs	0 lbs	25,621 lbs
Lattice Towers and Tubular Steel Poles[6]	49,000 lbs	0 lbs	49,000 lbs
Miscellaneous	15,000 lbs	0 lbs	15,000 lbs
Sanitation Waste	18,730 lbs	0 lbs	18,730 lbs

Source: SCE, 2008b – DR#4: Q4-17 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

[1] Wood cribbing attained from the job will be approximately 22,800 pounds for LST shipping calculated as follows: 21 LST's at approx. 126,970 pounds steel per LST and 2 LST's at approx. 90,000 pounds steel per LST / 50,000 pound capacity per truck = 57 loads @ 400 pounds cribbing per truck. Approximately 75% of the cribbing from the structures will be cut into 24" to 36" lengths for use on the assembly process and retained by the contractor. This leaves approximately 5,700 pounds to go to waste. Wood pallets from the job will be approximately 10 trucks with 15 pallets at 50 pounds each for a total of 7,500 pounds. Wood crates from the job will be approximately 10 trucks with 500 pounds crating each for a total of 5,000 pounds.

[2] Cardboard boxing and crating from the job will be approximately 10 trucks with 500 pounds crating each for a total of 5,000 pounds.

[3] Considering 5% spoils from foundations to be removed from site; 3.14=PI, 72"=diameter 500-LST with overbore, 20' depth LST hole = 24 LST's.; plus 36"=diameter 220-LST with overbore, 16' depth LST hole = 1 LST; plus 60"=diameter 220-TSP with overbore, 24' depth TSP hole=1 TSP. 100% spoils from road work and crane pads to remain at site; 5,850' length permanent new spur roads, 16' wide = 19 new spur roads estimated. 5,850 length permanent new spur roads. 40' by 50' crane pad, 2' deep = 27 estimated (utilizing existing pads at all locations practicable).

[4] = concrete @ 5,300 lbs cu/yd x 30"d x 48"l x 4 removals (1-220kv sc LST); + 48"d x 48"l x 8 removals (2-500kv sc LST).

[5] =(220kV conductor @ 1.33 lbs per foot x 3 conductor x 365 feet)+(500kV conductor @ 2.51 lbs per foot x 6 conductor x 1,400 feet)+(220kV conductor @1.33 lbs per foot x 3 conductor x 250 feet = 23,538 lbs +(220kV shield wire @ .517 lbs per foot x 2 wire x 365 feet)+(500kV shield wire @.517 lbs per foot x 2 wire x 1400 feet)+(220kV shield wire @ .517 lbs per foot x 2 wire x 250 feet = 2,085 lbs = total lbs 25,621 lbs / 50,000 per load = .5 loads.

[6] =(220kV lattice structures @ 15,000 lbs per structure x 2 structures)+(500kV lattice steel leg extensions @ 9,500 lbs per structure x 2 structures) = 49,500 lbs / 50,000 per load = 1 load).

Table 2.4-3a. Alternative 4 (Segment 8B) Estimate of Construction Waste – Segment 8B: New 220-kV Double-Circuit T/L (Chino Substation to Mira Loma Substation)

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Wood from Cribbing, Pallets, and Crates/Boxes	30,000 lbs	15,600 lbs	18,900 lbs
Cardboard Boxing, Etc.	2,500 lbs	0 lbs	2,500 lbs
Spoils from Foundation	2,070 cu yd	104 cu yd	1,967 cu yd
Concrete Foundations	843,622 lbs	0 lbs	843,622 lbs
Conductor and Shield Wire	436,643 lbs	0 lbs	436,643 lbs
Lattice Structures	1,074,000 lbs	0 lbs	1,074,000 lbs
Insulators and Misc. Hardware	69,000 lbs	0 lbs	69,000 lbs
Miscellaneous	25,000 lbs	0 lbs	25,000 lbs
Sanitation Waste	14,088 lbs	0 lbs	14,088 lbs

Source: SCE, 2009h – DR#9: Q3(d) for Segment 8B.

Table 2.4-4 Alternative 4B (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
CM and Inspection	5	5 - pickup trucks	8.75
Marshalling Yards	6	2 - forklifts 1 - RT crane 2 - pickup truck 1 - flatbed truck 1 - tractor truck 1 - flatbed trailer 1 - office trailer 1 - portable generator	8.75
Survey	2	1 - pickup truck	2
Road Work/Structure Pads	3	1 - dozer, track type, w/blade 1 - excavator, grade-all 1 - road grader 1 - water truck 1 - pickup truck 1 - tractor truck 1 - lowboy trailer 2 - 10-yard dump truck 1 - crew cab flatbed truck	2
Guard Poles	4	1 - pickup truck 1 - crew cab pickup truck 1 - pole truck and trailer 2 - bucket trucks 1 - drill rig 1 - backhoe w/bucket 1 - RT crane	0.5
Wreck Out Conductors, Structures and Foundations	8	2 - flatbed trucks w/bucket 1 - flatbed trucks w/boom 1 - pickup truck 2 - crew cab pickup trucks 1 - tension machine 1 - 3 drum puller 1 - tractor truck 2 - flatbed trailer 1 - lowboy trailer 1 - dozer, track type, w/blade 1 - backhoe w/ concrete hammer 1 - 150/300 ton crane	1.5

Table 2.4-4 Alternative 4B (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
		1 - water truck 1 - 2 T mechanics truck	
Foundation Installation	16	1 - pickup truck 2 - crew cab pickup trucks 1 - flatbed truck 2 - drill rigs 1 - backhoe w/bucket 1 - dozer, w/ blade (D6 type) 1 - boom trucks 1 - excavator, grade-all 1 - tractor truck 1 - lowboy trailer 1 - water truck 1 - 2 T mechanics truck 2 - portable generators 1 - 10-yard dump truck 2 - storage trailers 4 - concrete trucks	3
Tower Hauling/Assembly/Erection	64	4 - pickup trucks 1 - 2 1/2 ton flatbed truck 9 - crew cab pickup trucks 2 - tractor trucks 4 - flatbed trailers 5 - air compressors 1 - water truck 2 - portable generators 2 - 150/300 ton crane 1 - 2 T mechanics truck 4 - RT cranes	4.75
Conductor Operations	28	3 - pickup trucks 5 - crew cab pickup trucks 2 - RT cranes 6 - bucket trucks 1 - backhoe w/bucket 1 - conductor tensioner 1 - static tensioner 1 - sockline puller 1 - conductor puller 1 - sagging dozer 1 - dozer, w/ blade 6 - reel stand trailers 2 - tractor trucks 2 - flatbed trailers 1 - helicopter 4 - portable generators 1 - 2 T mechanics truck 1 - water truck	4.75
Cleanup	3	1 - pickup truck 1 - crew cab pickup truck 1 - road grader 1 - dozer 1 - excavator, grade-all 1 - tractor truck 1 - lowboy trailer 1 - portable generator 1 - 10-yard dump truck	3.25
TOTAL MANPOWER:	139		

Source: SCE, 2008b – DR#4: Q4-26 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). Note: Numbers provided herein are preliminary and subject to change based on final engineering.

Note: Typical construction operations for this project will work through the area performing the major tasks in a progressive manner. First will be the installation of a new 220-kV SC lattice dead-end structure in the Chino-Mesa 220-kV SC transmission line that is currently idle. This will move the idle line out of the immediate area and make room for the new installation work at this junction. The new structure M24-T1 will be installed approximately 200 feet north of new structure M57-T4. Following this work will be the relocation and replacing and insetting steel pole dead-end structures on the Mira Loma-Walnut and Mira Loma-Olinda 220-kV DC line (M23-T3, M23-T3A, M15-T1, M15-T1A), lowering the structure heights to allow the new 500-kV conductors to clear overhead without exceeding the 200 foot height. Following will be the removal of the old foundations and the filling and leveling of exposed foundation holes. At the same time, surveying of the structure sites, laying out and building of roads and pads along the line will start. This will be followed by the staking of new structure locations, digging of foundation holes and the installing of foundations for the structures. As these operations proceed the hauling and laying out of structure steel and the subsequent assembly and erection of the structures takes place. After all the structures are set in a given section, the installation of the conductors, shield wires and communication cables takes place. As the crews finish the main portion of the work they will start work on the re-routing of the existing Mira Loma-Serrano 500-kV SC and Lugo-Serrano 500-kV SC Lines in the vicinity of the new switching station area by removing existing suspension structures (M8-T3 and M8-T4) and installing new 500-kV DHA dead-end structures in their place. Additional structures (M8-T3A and M8-T3B) will be installed on the east and west sides of the new switching station for the line to access into the switching station. Following all the installation work, the guard pole crossing structures will be removed and final cleanup of the ROW and construction areas will take place. The number of vehicles and the duration they will be traveling through the area is dependent on the availability to access the ROW from the various roads in the area. While construction likely will be completed in the general time frames indicated, construction vehicles may be utilizing the roads through these areas for longer periods to access structure sites.

Table 2.4-5. Alternative 4B Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Segment 8A MP 2.2 to 19.2 (point of deviation from Alternative 2)					
Guard Pole Hole [1] (qty street crossings on quad maps)	21	P/4(28"/12)**2x6 locs *1.5	0.02	0.02	0
Guard Pole Truck Disturbance [1] (same above)	21	2 tracks x10'x2'x6 locs	0.12	0.12	0
Tower Sites (Tower wreck-out only) (Newly disturbed area only) [2]	11	(150' X 150')/2	2.84	2.84	0
TSP Foundation Holes [3] (qty TSP)	0	=PI()*((108"/2)^2)	0	0	0
TSP Pole Hole Truck Disturbance [3] (same above)	0	2 tracks x20'x2'	0	0	0
LST Footing Holes [3] (qty LST)	142	=PI()*((54"/2)^2)	0.04	0	0.04
LST Footings Truck Disturbance [3] (same above)	142	2 tracks x20'x2'x4 locs	1.04	1.04	0
LST and TSP Laydown and Assembly Area [3] (varies)	142	varies	112.74	112.74	0
Crane Pad for Erection [4] (qty structures)	33	50' X 50'	1.89	1.89	0
Wire Stringing Areas (pulling/tensioning/splicing) [2] (qty setups) <overlap demolition/new>	20	varies	36.21	36.21	0
Roads New Access (qty miles) [2]	0	L X 16' wide	0	0	0
Roads New Spur (qty miles) [2]	4	L X 16' wide	7.76	0	7.76
Roads Existing, <impacted areas of roads only> (qty miles) [2]	24	L X 16' wide	46.55	46.55	0
Radius from access road to spur road[2] (# Spur Roads Total)	52	50' R requires 1464 sq. ft.	1.75	0	1.75
Spur Rd Related Temp Disturbed Areas[2]	18	566 sq. ft per spur road	0.234	0.234	0
Additional Spur Rd Radius for TSP and LST haul Trucks [2]	12	2285 sq. ft. per spur road	0.63	0.63	0
Staging Areas for Materials and Equipment [5]	2	3-5 acres per yard	10	10	0
Total Estimated Land Disturbance S8A MP 2.2 to 19.2			221.82	212.27	9.55
Chino Hills Route B from S8A MP 19.2 to New Switching Station east of Chino Hills State Park					

Table 2.4-5. Alternative 4B Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Guard Pole Hole [6] (estimated qty main road crossings)	3	P/4(28"/12)**2x6 locs *1.5	0.003	0.003	0
Guard Pole Truck Damage [7] (same above)	3	2 tracks x10'x2'x6 locs	0.017	0.017	0
TSP Foundation Holes [8] (qty TSP)	12	=PI()*((108"/2)^2)	0.005	0	0.005
LST Footing Holes [9] (qty LST)	192	=PI()*((60"/2)^2)	0.069	0	0.069
LST Laydown and Assembly Area [10] (varies)	42	See note 10	41.093	41.093	0
Crane Pad for Erection (approx qty structures with slope)	42	40' X 50'	1.928	1.928	0
Wire Stringing Areas (pulling/tensioning/splicing) [14,15] (qty setups) <overlap demolition/new>	13	See notes 14 and 15	25.482	25.482	0
Roads New Access (qty miles)	0	L X 16' wide	0	0	0
Roads New Spur (qty miles) [13]	1.6	L X 16' wide	3.103	0	3.103
Roads Existing, <impacted areas of roads only> (qty miles)	20.37	L X 16' wide	39.505	39.505	0
Radius from access road to spur road (# Spur Roads Total)	40	50' R requires 1464 sq. ft.	1.344	0	1.344
Spur Rd Related Temp Disturbed Areas [11]	30	566 sq. ft per spur road	0.390	0.390	0
Additional Spur Rd Radius for LST haul Trucks [12]	30	2285 sq. ft. per spur road	1.574	1.574	0
Staging Areas for Materials and Equipment	1	5-10 acres per yard	10.00	10.00	0
Total Estimated Land Disturbance for Rerouted Portion of Alt 4B			124.51	119.99	4.52
Switching Station	1	10 acres temp 4-5 acres perm	10.00	5.00	5.00
Segment 8B - Chino Substation to Mira Loma Substation					
Guard Pole Hole [6] (estimated qty main road crossings)	27	P/4(28"/12)**2x6 locs *1.5	0.024	0.024	0
Guard Pole Truck Damage [7] (same above)	27	2 tracks x20'x2'x6 locs	0.298	0.298	0
LST Footing Holes (qty LST) TAN structures	22	=PI()*((48"/2)^2)	0.006	0	0.006
LST Footing Holes (qty LST) DE structures	15	=PI()*((60"/2)^2)	0.004	0	0.004
LST Laydown and Assembly Area	37	Varies	33.173	33.173	0
Crane Pad for Erection (approx qty structures with slope)	0	50' X 60'	0	0	0
Radius from access road to spur road (# Spur Roads Total)	15	50' R requires 1464 sq. ft.	0.504	0	0.504
Access Rd Related Temp Disturbed Areas [12]	15	566 sq. ft per spur road	0.195	0.195	0
Additional Access Rd Radius for LST Haul Trucks [13]	20	2285 sq. ft. per spur road	1.049	1.049	0
Wire Stringing Areas (pulling/tensioning/splicing) (qty setups) <overlap demolition/new>	7	Varies	10.79	10.79	0
Roads New Access (qty miles)	1.18	L X 16' wide	2.288	0	2.288

Table 2.4-5. Alternative 4B Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Roads Existing, <impacted areas of roads only> (qty miles)	3.31	L X 16' wide	6.419	6.419	0
Staging Areas for Materials and Equipment	1	10 acres	10.000	10.000	0
Total Estimated Land Disturbance for Segment 8B			64.75	61.95	2.80
Total Estimated Land Disturbance Alternative 4B (Seg 8A+8B)			~~356.33~~ 421.08	~~337.27~~ 399.21	~~19.07~~ 21.87
LAND DISTURBANCE RANGE (±20%)			~~285.1 – 427.6~~ 336.9 – 505.3	~~269.8 – 404.7~~ 319.4 – 479.1	~~15.3 – 22.9~~ 17.5 – 26.2

Source: SCE, 2008b – DR#4: Q4-25 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). SCE, 2009h - DR#9: Q3(b) for Segment 8B. For S8A MP 2.2 to 19.2, based on Table 2.2-9 (Alternative 2) – updated for Alternative 4D. New assumptions are provided below and footnoted in the table. All applicable previous assumptions are footnoted in Table 2.2-9 (above). Note: Numbers provided herein are preliminary and subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Estimated 49 street crossings between S8A MP 19.2 and 35.2 (Segments 8A, 8B, and 8C), which would not require guard structures due to re-route through CHSP (70 - 49 = 21).

2 Ratio from PEA based on mileage change [33 miles (Segment 8 starts at MP 2.2) vs. 19.2 miles].

3 SCE stated in DR#4: Q4-12 that 78 double-circuit structures (18 LSTs and 60 TSPs) would be eliminated from Segment 8 for Alternative 4.

4 Ratio number of crane pads by totally laydown/assembly areas (50 x 142/220)

5 Assume 2 staging area for first 19.2 miles of Segment 8.

6 Guard pole-assume three guard poles per each side of road = 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 20% more crossings present.

7 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

8 TSP-assume 60" dia x 30' depth with overbore for concrete backfill.

9 LST-assume 54" dia x 20" depth with overbore for concrete backfill.

10 LST and TSP structure layout, assembly and erection dimensions vary due to quantity of structures to be worked on located within immediate vicinity: =(100*200*1)+(150*200*2)+(200*200*39).

11 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2).

12 Difference between 80' radius and 80' radius from access to spur road for access by 80' trailer bed truck.

13 Spur road is required when access road is over 50' from structure site.

14 Setups site dimension vary due to terrain, industrial and commercial areas, with approx. 40% of a 200' x 400' site being disturbed: =(150*400*1)+(200*200*1)+(200*400*11).

15 Approximately every 7,500' and at points of inflection or DE structures when convenient.

Note: In addition to the 37 new DC 500-kV lattice structures, the re-route work at the new switching station site includes the replacing of 4 existing DC 220-kV suspension and dead-end lattice structure with 4 SC 220-kV 3-pole steel dead-end structure; the replacing of 2 existing DC 500-kV suspension lattice structures with dead-end structures; and the installation of 2 new DC 500-kV dead-end lattice structures outside the switching station area, all of which are included as part of this project work. Also will be the replacing of a 220-kV lattice structure at the junction at the start of the line with another 220-kV lattice dead-end structure to move the wires out of the way for the new 500-kV wires and structures.

Table 2.4-6. Alternative 4B (S8A MP 19.2 to Switching Station) Estimate of Construction Waste – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Wood from Cribbing Etc.[1]	68,750 lbs	37,500 lbs	31,250 lbs
Cardboard Boxing[2]	12,500 lbs	0 lbs	12,500 lbs
Soil, Vegetation, and Crane Pads[3]	40,333 cu yd	38,316 cu yd	2,017 cu yd

Concrete Foundations[4]	71,844 lbs	0 lbs	71,844 lbs
Conductor and Shield Wire[5]	57,194 lbs	0 lbs	57,194 lbs
Lattice Towers and Tubular Steel Poles[6]	295,000 lbs	0 lbs	295,000 lbs
Miscellaneous	30,000 lbs	0 lbs	30,000 lbs
Sanitation Waste	29,798 lbs	0 lbs	29,798 lbs

Source: SCE, 2008b – DR#4: Q4-27 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

1 Wood cribbing attained from the job will be approximately 48,000 pounds for LST and 3,200 pounds for TSP shipping calculated as follows: 37 LST's at approx. 130,583 pounds steel per LST and 1 LST at approx. 27,000 pounds steel per LST, and 4 TSP's at approx. 390,000 pounds steel per TSP / 50,000 pound capacity per truck = 105 loads @ 400 pounds cribbing per truck = 50,000 lbs. Approximately 75% of the cribbing from the structures will be cut into 24" to 36" lengths for use on the assembly process and retained by the contractor. This leaves approximately 10,500 pounds to go to waste. Wood pallets from the job will be approximately 15 trucks with 15 pallets at 50 pounds each for a total of 11,250 pounds. Wood crates from the job will be approximately 15 trucks with 500 pounds crating each for a total of 7,500 pounds.

2 Cardboard boxing and crating from the job will be approximately 25 trucks with 500 pounds crating each for a total of 12,500 pounds.

3 Considering 5% spoils from foundations to be removed from site; 3.14=PI, (72"=diameter 500-LST with overbore, 24' depth LST hole = 37 LST's); (plus 36"=diameter 220-LST with overbore, 16' depth LST hole = 1 LST);(plus 72"=diameter 220-TSP with overbore, 24' depth TSP hole = 12 TSP). 100% spoils from road work and crane pads to remain at site; 8,448 feet length new or extended permanent spur roads, 16' wide = 37 estimated. 40' by 50' crane pad, 2' deep = 37 estimated (utilizing existing pads at all locations practicable).

4 =concrete @ 5,300 lbs cu/yd x 30"d x 48"l x 4 removals (1-220kv sc LST); + 48"d x 48"l x 8 removals (2-220kv dc LST); + 30"d x 48"l x 4 removals (1-220kv sc LST); + 60"d x 48"l x 8 removals (2-500kv dc LST).

5 =(220kV conductor @ 1.33 lbs per foot x 3 conductor x 200 feet = 798 lbs)+(500kV conductor @ 2.51 lbs per foot x 12 conductor x 1630 feet = 49,095 lbs)+(220kV conductor @1.33 lbs per foot x 6 conductor x 600 feet = 4,788 lbs)+(220kV shield wire @ .517 lbs per foot x 2 wire x 200 feet = 206 lbs)+(500kV shield wire @.517 lbs per foot x 2 wire x 1630 feet = 1,685 lbs)+(220kV shield wire @ .517 lbs per foot x 600 feet = 620 lbs) = total lbs 57,194 lbs / 30,000 per load = 2 loads.

6 =(220kV sc lattice structure @ 17,000 lbs per structure x 1 structure)+(220kV dc lattice structure @ 27,000 lbs per structure x 2 structures)+(500kV SC lattice structure @ 85,000 lbs per structure x 2 structure) = 241,000 lbs / 30,000 per load = 8 loads).

Table 2.4-7. Alternative 4C (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
CM and Inspection	5	5 - pickup trucks	11
Marshalling Yards	6	2 - forklifts 1 - RT crane 2 - pickup truck 1 - flatbed truck 1 - tractor truck 1 - flatbed trailer 1 - office trailer 1 - portable generator	11
Survey	2	1 - pickup truck	3
Road Work/Structure Pads	3	1 - dozer, track type, w/blade 1 - excavator, grade-all 1 - road grader 1 - water truck 1 - pickup truck 1 - tractor truck 1 - lowboy trailer 2 - 10-yard dump truck 1 - crew cab flatbed truck	3
Guard Poles	4	1 - pickup truck 1 - crew cab pickup truck 1 - pole truck and trailer 2 - bucket trucks 1 - drill rig 1 - backhoe w/bucket 1 - RT crane	0.5

Table 2.4-7. Alternative 4C (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
Wreck Out Conductors, Structures and Foundations	12	2 - flatbed trucks w/bucket 2 - flatbed trucks w/boom 1 - pickup truck 2 - crew cab pickup trucks 1 - tension machine 1 - 3 drum puller 2 - tractor trucks 2 - flatbed trailers 1 - lowboy trailer 1 - dozer, track type, w/blade 1 - backhoe w/ concrete hammer 1 - 150/300 ton crane 1 - water truck 1 - 2 T mechanics truck	3.25
Foundation Installation	16	1 - pickup truck 2 - crew cab pickup trucks 1 - flatbed truck 2 - drill rigs 1 - backhoe w/bucket 1 - dozer, w/ blade (D6 type) 1 - boom truck 1 - excavator, grade-all 1 - tractor truck 1 - lowboy trailer 1 - water truck 1 - 2 T mechanics truck 2 - portable generators 1 - 10-yard dump truck 2 - storage trailers 4 - concrete trucks	4.25
Tower Hauling/Assembly/Erection	64	4 - pickup trucks 1 - 2 1/2 ton flatbed truck 8 - crew cab pickup trucks 2 - tractor trucks 4 - flatbed trailers 5 - air compressors 1 - water truck 2 - portable generators 2 - 150/300 ton crane 1 - 2 T mechanics truck 4 - RT cranes	8.75
Conductor Operations	28	3 - pickup trucks 5 - crew cab pickup trucks 2 - RT cranes 6 - bucket trucks 1 - backhoe w/bucket 1 - conductor tensioner 1 - static tensioner 1 - sockline puller 1 - conductor puller 1 - sagging dozer 1 - dozer, w/ blade 6 - reel stand trailers 2 - tractor trucks 2 - flatbed trailers 1 - helicopter 4 - portable generators 1 - 2 T mechanics truck	6

Table 2.4-7. Alternative 4C (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
		1 - water truck	
Cleanup	3	1 - pickup truck 1 - crew cab pickup truck 1 - road grader 1 - dozer 1 - excavator, grade-all 1 - tractor truck 1 - lowboy trailer 1 - portable generator 1 - 10-yard dump truck	3.5
TOTAL MANPOWER:	143		

Source: SCE, 2008b – DR#4: Q4-39 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). Note: Numbers provided herein are preliminary and subject to change based on final engineering.

Note: Typical construction operations for this project will work through the area performing the major tasks in a progressive manner. First there is the surveying and building of the access roads and construction pad sites. This is followed by the surveying of the structure locations, digging the foundation holes and the installation of the structure foundations. While the foundation is curing steel will be hauled to each site, layed out and then assembled. Once enough structures have been assembled an erection or tower setting crew will start up and set all the structures. As this operation proceeds along wire stringing operations will get started. Typically the lead lines (or small cable) are flown in with a helicopter first and then hooked onto a hard line which is pulled from the tensioner end off a smaller puller to the larger puller end. Once the lead line cable is pulled in it is hooked onto the pulling line (or larger cable) which is then pulled back towards the tensioner and smaller puller and the reels of cable. It is then hooked to the bundle conductors and the large puller pulls back the pulling line thereby pulling in the conductors. This process is repeated for all the cables between given setup sites. The shield wires and fiber optic cable (if installed) are typicall pulled in with a smaller puller, but in much the same manner. Once the conductors and wires have been pulled in they are all sagged and then attached to the structure with the required insulators and hardware. For this project there will be 3 line segments that will require 220kV DC lines and 500kV SC lines be rerouted and the old lines removed. It will also include the construction of a new 500kV DC line. All lines will be constructed to the new switching station. The segments are as follows: The rerouting of the MIRA LOMA-WALNUT / MIRA LOMA-OLINDA 220kV DC lattice line from structure M20-T1 to M16-T3. When this is completed the existing 220kV DC line will be removed from in between these structure locations and the sites reclaimed. The rerouting of the LUGO-SERRANO 500kV SC (North Circuit) lattice line from structure M10-T2 to M12-T2. When this is completed the existing 500kV SC lattice line will be removed from in between these structure locations and the sites reclaimed. The rerouting of the MIRA LOMA-SERRANO 500kV SC (South Circuit) lattice line from structure M10-T2 to M12-T2. When this is completed the existing 500kV SC lattice line will be removed from in between these structure locations and the sites reclaimed. The construction of a new 500kV DC lattice line from structure M57-T2 to M63-T1. When this is completed the existing 500kV SC lattice line will be removed from in between these structure locations and the sites reclaimed. The number of vehicles required to perform the work and the duration they will be traveling through the area is dependent on the availability to access the ROW from the various roads in the area. While construction likely will be completed in the general time frames indicated, construction vehicles may be utilizing the roads through these areas for longer periods to access structure sites.

Table 2.4-8. Alternative 4C Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Segment 8A MP 2.2 to 19.2 (point of deviation from Alternative 2)					
Guard Pole Hole [1] (qty street crossings on quad maps)	21	P/4(28"/12)**2x6 locs *1.5	0.02	0.02	0
Guard Pole Truck Disturbance [1] (same above)	21	2 tracks x10'x2'x6 locs	0.12	0.12	0
Tower Sites (Tower wreck-out only) (Newly disturbed area only) [2]	11	(150' X 150')/2	2.84	2.84	0
TSP Foundation Holes [3] (qty TSP)	0	=PI()*((108"/2)^2)	0	0	0
TSP Pole Hole Truck Disturbance [3] (same above)	0	2 tracks x20'x2'	0	0	0
LST Footing Holes [3] (qty LST)	142	=PI()*((54"/2)^2)	0.04	0	0.04
LST Footings Truck Disturbance [3] (same above)	142	2 tracks x20'x2'x4 locs	1.04	1.04	0

Table 2.4-8. Alternative 4C Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
LST and TSP Laydown and Assembly Area [3] (varies)	142	varies	112.74	112.74	0
Crane Pad for Erection [4] (qty structures)	33	50' X 50'	1.89	1.89	0
Wire Stringing Areas (pulling/tensioning/splicing) [2] (qty setups) <overlap demolition/new>	20	varies	36.21	36.21	0
Roads New Access (qty miles) [2]	0	L X 16' wide	0	0	0
Roads New Spur (qty miles) [2]	4	L X 16' wide	7.76	0	7.76
Roads Existing, <impacted areas of roads only> (qty miles) [2]	24	L X 16' wide	46.55	46.55	0
Radius from access road to spur road [2] (# Spur Roads Total)	52	50' R requires 1464 sq. ft.	1.75	0	1.75
Spur Rd Related Temp Disturbed Areas [2]	18	566 sq. ft per spur road	0.234	0.234	0
Additional Spur Rd Radius for TSP and LST haul Trucks [2]	12	2285 sq. ft. per spur road	0.63	0.63	0
Staging Areas for Materials and Equipment [5]	2	3-5 acres per yard	10	10	0
Total Estimated Land Disturbance S8A MP 2.2 to 19.2			221.82	212.27	9.55
Chino Hills Route C from S8A MP 19.2 to New Switching Station (Includes Re-Routes of existing T/Ls in CHSP)					
Guard Pole Hole [6] (estimated qty main road crossings)	8	P/4(28"/12)**2x6 locs *1.5	0.007	0.007	0
Guard Pole Truck Damage [7] (same above)	8	2 tracks x10'x2'x6 locs	0.044	0.044	0
Tower Sites (Tower wreck-out only) (Newly disturbed area only) [2]	29 (17 s-c 500-kV, 12 d-c 220-kV)	(150' X 150')/2	7.490	7.490	0
LST Footing Holes [8] (qty LST)	268	=PI()*((60"/2)^2)	0.097	0	0.097
LST Laydown and Assembly Area [9] (varies)	67	See note 9	53.782	53.782	0
Crane Pad for Erection (approx qty structures with slope)	67	40' X 50'	3.076	3.076	0
Wire Stringing Areas (pulling/tensioning/splicing) [13,14] (qty setups) <overlap demolition/new>	14	See notes 13 and 14	25.482	25.482	0
Roads New Access (qty miles)	0.5	L X 16' wide	0.970	0	0.970
Roads New Spur (qty miles) [12]	4.73	L X 16' wide	9.173	0	9.173
Roads Existing, <impacted areas of roads only> (qty miles)	20.48	L X 16' wide	39.719	39.719	0
Radius from access road to spur road (# Spur Roads Total)	50	50' R requires 1464 sq. ft.	1.680	0	1.680
Spur Rd Related Temp Disturbed Areas [10]	30	566 sq. ft per spur road	0.390	0.390	0
Additional Spur Rd Radius for LST haul Trucks [11]	30	2285 sq. ft. per spur road	1.574	1.574	0
Staging Areas for Materials and Equipment	1	5-10 acres per yard	10.00	10.00	0
Total Estimated Land Disturbance for Rerouted Portion of Alt 4C			153.48~~152.51~~	141.56	11.92~~10.95~~
Switching Station	1	32~~10~~ acres temp 6.24~~-5~~ acres perm	32.00~~10.00~~	25.80~~5.00~~	6.20~~5.00~~

Table 2.4-8. Alternative 4C Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Segment 8B - Chino Substation to Mira Loma Substation					
Guard Pole Hole [6] (estimated qty main road crossings)	27	P/4(28"/12)**2x6 locs *1.5	0.024	0.024	0
Guard Pole Truck Damage [7] (same above)	27	2 tracks x20'x2'x6 locs	0.298	0.298	0
LST Footing Holes (qty LST) TAN structures	22	=PI()*((48"/2)^2)	0.006	0	0.006
LST Footing Holes (qty LST) DE structures	15	=PI()*((60"/2)^2)	0.004	0	0.004
LST Laydown and Assembly Area	37	Varies	33.173	33.173	0
Crane Pad for Erection (approx qty structures with slope)	0	50' X 60'	0	0	0
Radius from access road to spur road (# Spur Roads Total)	15	50' R requires 1464 sq. ft.	0.504	0	0.504
Access Rd Related Temp Disturbed Areas [12]	15	566 sq. ft per spur road	0.195	0.195	0
Additional Access Rd Radius for LST Haul Trucks [13]	20	2285 sq. ft. per spur road	1.049	1.049	0
Wire Stringing Areas (pulling/tensioning/splicing) (qty setups) <overlap demolition/new>	7	Varies	10.79	10.79	0
Roads New Access (qty miles)	1.18	L X 16' wide	2.288	0	2.288
Roads Existing, <impacted areas of roads only> (qty miles)	3.31	L X 16' wide	6.419	6.419	0
Staging Areas for Materials and Equipment	1	10 acres	10.000	10.000	0
Total Estimated Land Disturbance for Segment 8B			64.75	61.95	2.80
Total Estimated Land Disturbance Alternative 4C (Seg 8A+8B)			~~384.33~~ 472.05	~~358.84~~ 441.58	~~25.50~~ 30.47
LAND DISTURBANCE RANGE (±20%)			~~307.5 – 461.2~~ 377.6 – 566.5	~~287.1 – 430.6~~ 353.3 – 529.9	~~20.4 – 30.6~~ 24.4 – 36.6

Source: SCE, 2008b – DR#4: Q4-38 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station, including re-routes of existing T/Ls). SCE, 2009e – Site development plan for Alt 4C switching station and new access roads on Aerojet property. SCE, 2009h - DR#9: Q3(b) for Segment 8B. For S8A MP 2.2 to 19.2, based on Table 2.2-9 (Alternative 2) – updated for Alternative 4C~~D~~. New assumptions are provided below and footnoted in the table. All applicable previous assumptions are footnoted in Table 2.2-9 (above). Note: Numbers provided herein are preliminary and subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Estimated 49 street crossings between S8A MP 19.2 and 35.2 (Segments 8A, 8B, and 8C), which would not require guard structures due to re-route through CHSP (70 - 49 = 21).

2 Ratio from PEA based on mileage change [33 miles (Segment 8 starts at MP 2.2) vs. 19.2 miles].

3 SCE stated in DR#4: Q4-12 that 78 double-circuit structures (18 LSTs and 60 TSPs) would be eliminated from Segment 8 for Alternative 4.

4 Ratio number of crane pads by totally laydown/assembly areas (50 x 142/220)

5 Assume 2 staging area for first 19.2 miles of Segment 8.

6 Guard pole-assume three guard poles per each side of road = 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 20% more crossings present.

7 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

8 LST-assume 54" dia x 20" depth with overbore for concrete backfill.

9 LST structure layout, assembly and erection dimensions vary due to topography and quantity of structures to be worked on located within immediate vicinity: (Temporary disturbance for crane pad of 40 x 50 is excluded from this total acreage) = (50*200*3)+(100*200*1)+(125*250*1)+ (150*150*1)+(150*200*2)+(150*250*4)+ (150*300*3)+(175*200*6)+(175*300*6)+ (200*200*33)+(200*400*2).

10 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2).

11 Difference between 80' radius and 80' radius from access to spur road for access by 80' trailer bed truck.

12 Spur road is required when access road is over 50' from structure site.

13 Setups site dimension vary due to terrain, with approx. 60% of a 200' x 400' site being disturbed: = (150*200*4)+(200*200*1)+(200*300*2)+(200*400*7).

14 Approximately every 7,500' and at points of inflection or DE structures when convenient.

Note: The above quantities include work on the following elements: (1) Rerouting the Mira Loma-Walnut / Mira Loma-Olinda 220kV DC line – 3.43 miles new construction (17 new structures), wreck-out of 2.40 miles (12 structures); (2) Rerouting the Lugo-Serrano (North Circuit) 500kV SC line – 3.59 miles of new construction (15 new structures), wreck-out of 2.49 miles (9 structures); (3) Rerouting the Mira Loma-Serrano (South Circuit) 500kV SC line – 3.50 miles new construction (15 new structures), wreck-out of 2.40 miles (8 structures); and (4) New construction of 500kV DC line – 5.65 miles new construction (19 new structures), rerouting of Chino-Mesa 220kV – Idle (1 structure).

Table 2.4-8a. Alternative 4C Modified Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Segment 8A MP 2.2 to 19.2 (point of deviation from Alternative 2)					
Guard Pole Hole [1] (qty street crossings on quad maps)	21	P/4(28"/12)**2x6 locs *1.5	0.02	0.02	0
Guard Pole Truck Disturbance [1] (same above)	21	2 tracks x10'x2'x6 locs	0.12	0.12	0
Tower Sites (Tower wreck-out only) (Newly disturbed area only) [2]	11	(150' X 150')/2	2.84	2.84	0
TSP Foundation Holes [3] (qty TSP)	0	=PI()*((108"/2)^2)	0	0	0
TSP Pole Hole Truck Disturbance [3] (same above)	0	2 tracks x20'x2'	0	0	0
LST Footing Holes [3] (qty LST)	142	=PI()*((54"/2)^2)	0.04	0	0.04
LST Footings Truck Disturbance [3] (same above)	142	2 tracks x20'x2'x4 locs	1.04	1.04	0
LST and TSP Laydown and Assembly Area [3] (varies)	142	varies	112.74	112.74	0
Crane Pad for Erection [4] (qty structures)	33	50' X 50'	1.89	1.89	0
Wire Stringing Areas (pulling/tensioning/splicing) [2] (qty setups) <overlap demolition/new>	20	varies	36.21	36.21	0
Roads New Access (qty miles) [2]	0	L X 16' wide	0	0	0
Roads New Spur (qty miles) [2]	4	L X 16' wide	7.76	0	7.76
Roads Existing, <impacted areas of roads only> (qty miles) [2]	24	L X 16' wide	46.55	46.55	0
Radius from access road to spur road [2] (# Spur Roads Total)	52	50' R requires 1464 sq. ft.	1.75	0	1.75
Spur Rd Related Temp Disturbed Areas [2]	18	566 sq. ft per spur road	0.234	0.234	0
Additional Spur Rd Radius for TSP and LST haul Trucks [2]	12	2285 sq. ft. per spur road	0.63	0.63	0
Staging Areas for Materials and Equipment [5]	2	3-5 acres per yard	10	10	0
Total Estimated Land Disturbance S8A MP 2.2 to 19.2			221.82	212.27	9.55
Chino Hills Route C Modified from S8A MP 19.2 to New Switching Station (Includes Re-Routes of existing T/Ls in CHSP)					
Guard Pole Hole [6] (estimated qty main road crossings)	8	P/4(28"/12)**2x6 locs *1.5	0.007	0.007	0
Guard Pole Truck Damage [7] (same above)	8	2 tracks x10'x2'x6 locs	0.044	0.044	0

Table 2.4-8a. Alternative 4C Modified Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	23 (15 s-c 500-kV, 8 d-c 220-kV)	(150' X 150')/2	5.94	5.94	0
LST Footing Holes [8,9] (qty LST)	224	=PI()*((60"/2)^2)	0.097	0	0.097
LST Laydown and Assembly Area [10] (varies)	56	See note 10	65.407	65.407	0
Crane Pad for Erection (approx qty structures with slope)	56	40' X 50'	2.571	2.571	0
Wire Stringing Areas (pulling/tensioning/splicing) [14,15] (qty setups) <overlap demolition/new>	10	See notes 14 and 15	22.934	22.934	0
Roads New Access (qty miles)	4.7	L X 16' wide	9.155	0	9.155
Roads New Spur (qty miles) [13]	0.95	L X 16' wide	1.842	0	1.842
Roads Existing, <impacted areas of roads only> (qty miles) [16]	5.7	L X 16' wide	11.055	0	11.055
Radius from access road to spur road (# Spur Roads Total)	50	50' R requires 1464 sq. ft.	1.680	0	1.680
Spur Rd Related Temp Disturbed Areas [13]	30	566 sq. ft per spur road	0.390	0.390	0
Additional Spur Rd Radius for LST haul Trucks [12]	30	2285 sq. ft. per spur road	1.574	1.574	0
Staging Areas for Materials and Equipment	1	5-10 acres per yard	10.00	10.00	0
Total Estimated Land Disturbance for Rerouted Portion of Alt 4C			132.70	108.87	23.83
Switching Station [17]	1	32 acres temp 6.2 acres perm	18.00	11.80	6.20
Roads New Access (qty miles) [18]	2.75	L X 40' wide	13.315	4.100	9.215
Segment 8B - Chino Substation to Mira Loma Substation					
Guard Pole Hole [6] (estimated qty main road crossings)	27	P/4(28"/12)**2x6 locs *1.5	0.024	0.024	0
Guard Pole Truck Damage [7] (same above)	27	2 tracks x20'x2'x6 locs	0.298	0.298	0
LST Footing Holes (qty LST) TAN structures	22	=PI()*((48"/2)^2)	0.006	0	0.006
LST Footing Holes (qty LST) DE structures	15	=PI()*((60"/2)^2)	0.004	0	0.004
LST Laydown and Assembly Area	37	Varies	33.173	33.173	0
Crane Pad for Erection (approx qty structures with slope)	0	50' X 60'	0	0	0
Radius from access road to spur road (# Spur Roads Total)	15	50' R requires 1464 sq. ft.	0.504	0	0.504
Access Rd Related Temp Disturbed Areas [12]	15	566 sq. ft per spur road	0.195	0.195	0
Additional Access Rd Radius for LST Haul Trucks [13]	20	2285 sq. ft. per spur road	1.049	1.049	0
Wire Stringing Areas (pulling/tensioning/splicing) (qty setups) <overlap demolition/new>	7	Varies	10.79	10.79	0
Roads New Access (qty miles)	1.18	L X 16' wide	2.288	0	2.288
Roads Existing, <impacted areas of roads only> (qty miles)	3.31	L X 16' wide	6.419	6.419	0

Table 2.4-8a. Alternative 4C Modified Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Staging Areas for Materials and Equipment	1	10 acres	10.000	10.000	0
Total Estimated Land Disturbance for Segment 8B			64.75	61.95	2.80
Total Estimated Land Disturbance Alternative 4C Modified (8A+8B)			450.59	399.00	51.59
LAND DISTURBANCE RANGE (±20%)			360.5 – 540.7	319.2 – 478.8	41.3 – 61.9

Source: SCE, 2009g – DR#8: Q11 Attch1: Land disturbance by element for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station, including re-routes of existing T/Ls). SCE, 2009h - DR#9: Q3(b) for Segment 8B. For S8A MP 2.2 to 19.2, based on Table 2.2-9 (Alternative 2) – updated for Alternative 4C Mod. New assumptions are provided below and footnoted in the table. All applicable previous assumptions are footnoted in Table 2.2-9 (above). Note: Numbers provided herein are preliminary and subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Estimated 49 street crossings between S8A MP 19.2 and 35.2 (Segments 8A, 8B, and 8C), which would not require guard structures due to re-route through CHSP (70 - 49 = 21).

2 Ratio from PEA based on mileage change [33 miles (Segment 8 starts at MP 2.2) vs. 19.2 miles].

3 SCE stated in DR#4: Q4-12 that 78 double-circuit structures (18 LSTs and 60 TSPs) would be eliminated from Segment 8 for Alternative 4.

4 Ratio number of crane pads by totally laydown/assembly areas (50 x 142/220)

5 Assume 2 staging areas for first 19.2 miles of Segment 8.

6 Guard pole-assume three guard poles per each side of road = 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 20% more crossings present.

7 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

8 LST-assume 54" dia x 30" depth with overbore for concrete backfill.

9 LST- assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

10 LST structure layout, assembly and erection dimensions vary due to topography and quantity of structures to be worked on within immediate vicinity: (Temporary disturbance for crane pad of 40' x 50' is excluded from this total acreage) = (175*200*15)+(200*400*16)+(200*300*22)+(200*200*4).

11 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2).

12 Difference between 80' radius and 80' radius from access to spur road for access by 80' trailer bed truck.

13 Spur road is required when access road is over 50' from structure site.

14 LST setup site dimensions vary due to terrain, with approximately 60 percent of a 200'x400' site being disturbed = (150*200*4)+(200*200*1)+(200*300*2)+(200*400*7).

15 Approximately every 7,500' and at points of inflection or DE structures when convenient.

16 Of the approximately existing 18 miles, approximately 5.7 miles will have to be reworked to widen the road, provide access to spur roads, etc.

17 Switching station earthwork estimate based on balanced cut/fill approach. Area of permanent disturbance from site plan (DR#8 – Q1 Attch 2).

18 The roads to the new switching station are partially existing, although inadequate, and partially paved. Since the road to the switching station is to be substantially refurbished, the entire route is considered disturbance.

Note: The above quantities include work on the following elements: (1) Rerouting the Mira Loma-Walnut / Mira Loma-Olinda 220kV DC line – 2.52 miles new construction (15 new structures), wreck-out of 2.19 miles (9 structures); (2) Rerouting the Lugo/Mira Loma-Serrano 500kV DC line out of the new switching station – 1.9 miles of new construction (14 new structures), wreck-out of 1.85 miles (7 structures); (3) Rerouting the Lugo/Mira Loma-Serrano 500kV DC line into the new switching station – 1.8 miles new construction (11 new structures), wreck-out of 1.85 miles (8 structures); and (4) New construction of 500kV DC line – 4.7 miles new construction (15 new structures), rerouting of Chino-Mesa 220kV – Idle (1 structure).

Table 2.4-9. Alternative 4C (S8A MP 19.2 to Switching Station) Estimate of Construction Waste – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Wood from Cribbing Etc.[1]	61,824 lbs	46,368 lbs	15,456 lbs
Cardboard Boxing[2]	12,500 lbs	0 lbs	12,500 lbs
Soil, Vegetation, and Crane Pads[3]	41,373 cu yd	39,304 cu yd	2,069 cu yd
Concrete Foundations[4]	415,799 lbs	0 lbs	415,799 lbs
Conductor and Shield Wire[5]	646,654 lbs	0 lbs	646,654 lbs
Lattice Towers and Tubular Steel Poles[6]	1,921,000 lbs	0 lbs	1,921,000 lbs
Miscellaneous	40,000 lbs	0 lbs	40,000 lbs
Sanitation Waste	40,015 lbs	0 lbs	40,015 lbs

Source: SCE, 2008b – DR#4: Q4-40 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station, including re-routing existing 500/220-kV T/Ls). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

1 Wood cribbing attained from the job will be approximately 48,000 pounds for LST shipping calculated as follows: 17 220kV DC LST's at approx. 51,424 pounds steel per LST; 15 500kV SC LST's at approx. 63,855 pounds steel per LST; 15 500kV SC LST's at approx. 70,809 pounds stell per LST; and 20 500kV DC LST'S at approx. 124,507 pounds steel per LST / 50,000 pound capacity per truck = 108 loads @ 400 pounds cribbing per truck = 43,074,000 lbs. Approximately 75% of the cribbing from the structures will be cut into 24" to 36" lengths for use on the assembly process and retained by the contractor. This leaves approximately 10,768 pounds to go to waste. Wood pallets from the job will be approximately 15 trucks with 15 pallets at 50 pounds each for a total of 11,250 pounds. Wood crates from the job will be approximately 15 trucks with 500 pounds crating each for a total of 7,500 pounds.

2 Cardboard boxing and crating from the job will be approximately 25 trucks with 500 pounds crating each for a total of 12,500 pounds.

3 Considering 5% spoils from foundations to be removed from site; 3.14=PI, (72"=diameter 500 DC-LST's with overbore, 24' depth LST hole = 19 LST's); (plus 54"=diameter 500 SC-LST's with overbore, 20' depght LST hole = 30 LST's); (plus 54"=diameter 220-LST's with overbore, 16' depth LST hole = 18 LST's). 100% spoils from road work and crane pads to remain at site; 24,975 feet length new permanent spur roads, 16' wide = 45 new or extended spur roads estimated. 24,975' length permanent new spur roads. 40' by 50' crane pad, 2' deep = 67 estimated (utilizing existing pads at all locations practicable).

4 =concrete @ 5,300 lbs cu/yd x 54"d x 48"l x 4 removals (12-220kv dc LST);+60"d x 48"l x 4 removals (17-500kv sc LST);+30"d x 48"l x 4 removals (1-220kv sc LST).

5 =(220kV conductor @ 1.33 lbs per foot x 12 conductor x 155,866 feet = 207,302 lbs)+(500kV conductor @ 2.51 lbs per foot x 6 conductor x 158,788 feet = 398,557 lbs)+(220kV shield wire @ .517 lbs per foot x 2 wire x 25,977 feet = 13,430 lbs)+(500kV shield wire @.517 lbs per foot x 2 wire x 52,929 feet = 27,364 lbs) = 646653 lbs / 30,000 per load = 22 loads

6 =(220kV sc lattice structure @ 17,000 lbs per structure x 1 structure)+(220kV dc lattice structure @ 52,000 lbs per structure x 17 structures)+(500kV SC lattice structure @ 60,000 lbs per structure x 17 structure) = 241,000 lbs / 30,000 per load = 8 loads)

Note: The above quantities include work on the following elements: (1) Rerouting the Mira Loma-Walnut / Mira Loma-Olinda 220kV DC line – 3.43 miles new construction (17 new structures), wreck-out of 2.40 miles (12 structures); (2) Rerouting the Lugo-Serrano (North Circuit) 500kV SC line – 3.59 miles of new construction (15 new structures), wreck-out of 2.49 miles (9 structures); (3) Rerouting the Mira Loma-Serrano (South Circuit) 500kV SC line – 3.50 miles new construction (15 new structures), wreck-out of 2.40 miles (8 structures); and (4) New construction of 500kV DC line – 5.65 miles new construction (19 new structures), rerouting of Chino-Mesa 220kV – Idle (1 structure).

Table 2.4-9a. Alternative 4C Modified (S8A MP 19.2 to Switching Station) Estimate of Construction Waste – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Wood from Cribbing Etc.[1]	46,350 lbs	34,763 lbs	11,500 lbs
Cardboard Boxing[2]	12,500 lbs	0 lbs	12,500 lbs
Soil, Vegetation, and Crane Pads[3]	41,373 cu yd	39,304 cu yd	2,069 cu yd
Concrete Foundations[4]	415,799 lbs	0 lbs	415,799 lbs
Conductor and Shield Wire[5]	646,654 lbs	0 lbs	646,654 lbs
Lattice Towers and Tubular Steel Poles[6]	1,921,000 lbs	0 lbs	1,921,000 lbs
Miscellaneous	40,000 lbs	0 lbs	40,000 lbs
Sanitation Waste	40,015 lbs	0 lbs	40,015 lbs

Source: SCE, 2009g: DR#8, Q13 Attch1 for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station, including re-routing existing 500/220-kV T/Ls). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

Note: The above quantities include work on the following elements: (1) Rerouting the Mira Loma-Walnut / Mira Loma-Olinda 220kV DC line – 2.52 miles new construction (15 new structures), wreck-out of 2.19 miles (9 structures); (2) Rerouting the Lugo/Mira Loma-Serrano 500kV DC line out of the new switching station – 1.9 miles of new construction (14 new structures), wreck-out of 1.85 miles (7 structures); (3) Rerouting the Lugo/Mira Loma-Serrano 500kV DC line into the new switching station – 1.8 miles new construction (11 new structures), wreck-out of 1.85 miles (8 structures); and (4) New construction of 500kV DC line – 4.7 miles new construction (15 new structures), rerouting of Chino-Mesa 220kV – Idle (1 structure).

Table 2.4-10. Alternative 4D (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Construction Element	Personnel	Equipment Type/Quantity	Duration (months)
CM and Inspection	5	5 - pickup trucks	10.5
Marshalling Yards	6	2 - forklifts 1 - RT crane 2 - pickup truck 1 - flatbed truck 1 - tractor truck 1 - flatbed trailer 1 - office trailer 1 - portable generator	10.5
Survey	2	1 - pickup truck	3.25
Road Work/Structure Pads	3	1 - dozer, track type, w/blade 1 - excavator, grade-all 1 - road grader 1 - water truck 1 - pickup truck 1 - tractor truck 1 - lowboy trailer 2 - 10-yard dump truck 1 - crew cab flatbed truck	3.25
Guard Poles	4	1 - pickup truck 1 - crew cab pickup truck 1 - pole truck and trailer 2 - bucket trucks 1 - drill rig 1 - backhoe w/bucket 1 - RT crane	0.5
Wreck Out Conductors, Structures and Foundations	8	2 - flatbed trucks w/bucket 1 - flatbed trucks w/boom 1 - pickup truck 2 - crew cab pickup trucks 1 - tension machine	1.5

Table 2.4-10. Alternative 4D (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

		1 - 3 drum puller 1 - tractor truck 2 - flatbed trailer 1 - lowboy trailer 1 - dozer, track type, w/blade 1 - backhoe w/ concrete hammer 1 - 150/300 ton crane 1 - water truck 1 - 2 T mechanics truck	
Foundation Installation	16	1 - pickup truck 2 - crew cab pickup trucks 1 - flatbed truck 2 - drill rigs 1 - backhoe w/bucket 1 - dozer, w/ blade (D6 type) 1 - boom trucks 1 - excavator, grade-all 1 - tractor truck 1 - lowboy trailer 1 - water truck 1 - 2 T mechanics truck 2 - portable generators 1 - 10-yard dump truck 2 - storage trailers 4 - concrete trucks	4
Tower Hauling/Assembly/Erection	64	4 - pickup trucks 1 - 2 1/2 ton flatbed truck 9 - crew cab pickup trucks 2 - tractor trucks 4 - flatbed trailers 5 - air compressors 1 - water truck 2 - portable generators 2 - 150/300 ton crane 1 - 2 T mechanics truck 4 - RT cranes	7
Conductor Operations	28	3 - pickup trucks 5 - crew cab pickup trucks 2 - RT cranes 6 - bucket trucks 1 - backhoe w/bucket 1 - conductor tensioner 1 - static tensioner 1 - sockline puller 1 - conductor puller 1 - sagging dozer 1 - dozer, w/ blade 6 - reel stand trailers 2 - tractor trucks 2 - flatbed trailers 1 - helicopter 4 - portable generators 1 - 2 T mechanics truck 1 - water truck	4.75
Cleanup	3	1 - pickup truck 1 - crew cab pickup truck 1 - road grader 1 - dozer 1 - excavator, grade-all	3.25

Table 2.4-10. Alternative 4D (S8A MP 19.2 to Switching Station) Construction Equipment and Workforce Estimates By Activity – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

		1 - tractor truck 1 - lowboy trailer 1 - portable generator 1 - 10-yard dump truck	
TOTAL MANPOWER:	139		

Source: SCE, 2008b – DR#4: Q4-47 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). Note: Numbers provided herein are preliminary and subject to change based on final engineering.

Note: Typical construction operations for this project will work through the area performing the major tasks in a progressive manner. First will be the installation of a new 220-kV SC lattice dead-end structure in the Chino-Mesa 220-kV SC transmission line that is currently idle. This will move the idle line out of the immediate area and make room for the new installation work at this junction. The new structure M24-T1will be installed approximately 200 feet north of new structure M57-T4. Following this work will be the relocation and replacing and insetting steel pole dead-end structures on the Mira Loma-Walnut and Mira Loma-Olinda 220-kV DC line (M23-T3, M23-T3A, M15-T1, M15-T1A), lowering the structure heights to allow the new 500-kV conductors to clear overhead without exceeding the 200 foot height. Following will be the removal of the old foundations and the filling and leveling of exposed foundation holes. At the same time, surveying of the structure sites, laying out and building of roads and pads along the line will start. This will be followed by the staking of new structure locations, digging of foundation holes and the installing of foundations for the structures. As these operations proceed the hauling and laying out of structure steel and the subsequent assembly and erection of the structures takes place. After all the structures are set in a given section, the installation of the conductors, shield wires and communication cables takes place. As the crews finish the main portion of the work they will start work on the re-routing of the existing Mira Loma-Serrano 500-kV SC and Lugo-Serrano 500-kV SC Lines in the vicinity of the new switching station area by removing existing suspension structures (M8-T3 and M8-T4) and installing new 500-kV DHA dead-end structures in their place. Additional structures (M8-T3A and M8-T3B) will be installed on the east and west sides of the new switching station for the line to access into the switching station. Following all the installation work, the guard pole crossing structures will be removed and final cleanup of the ROW and construction areas will take place. The number of vehicles and the duration they will be traveling through the area is dependent on the availability to access the ROW from the various roads in the area. While construction likely will be completed in the general time frames indicated, construction vehicles may be utilizing the roads through these areas for longer periods to access structure sites.

Table 2.4-11. Alternative 4D Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Segment 8A MP 2.2 to 19.2 (point of deviation from Alternative 2)					
Guard Pole Hole [1] (qty street crossings on quad maps)	21	P/4(28"/12)**2x6 locs *1.5	0.02	0.02	0
Guard Pole Truck Disturbance [1] (same above)	21	2 tracks x10'x2'x6 locs	0.12	0.12	0
Tower Sites (Tower wreck-out only) (Newly disturbed area only) [2]	11	(150' X 150')/2	2.84	2.84	0
TSP Foundation Holes [3] (qty TSP)	0	=PI()*((108"/2)^2)	0	0	0
TSP Pole Hole Truck Disturbance [3] (same above)	0	2 tracks x20'x2'	0	0	0
LST Footing Holes [3] (qty LST)	142	=PI()*((54"/2)^2)	0.04	0	0.04
LST Footings Truck Disturbance [3] (same above)	142	2 tracks x20'x2'x4 locs	1.04	1.04	0
LST and TSP Laydown and Assembly Area [3] (varies)	142	varies	112.74	112.74	0
Crane Pad for Erection [4] (qty structures)	33	50' X 50'	1.89	1.89	0
Wire Stringing Areas (pulling/tensioning/splicing) [2] (qty setups) <overlap demolition/new>	20	varies	36.21	36.21	0
Roads New Access (qty miles) [2]	0	L X 16' wide	0	0	0
Roads New Spur (qty miles) [2]	4	L X 16' wide	7.76	0	7.76
Roads Existing, <impacted areas of roads only> (qty miles) [2]	24	L X 16' wide	46.55	46.55	0
Radius from access road to spur road [2] (# Spur Roads Total)	52	50' R requires 1464 sq. ft.	1.75	0	1.75

Table 2.4-11. Alternative 4D Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Spur Rd Related Temp Disturbed Areas [2]	18	566 sq. ft per spur road	0.234	0.234	0
Additional Spur Rd Radius for TSP and LST haul Trucks [2]	12	2285 sq. ft. per spur road	0.63	0.63	0
Staging Areas for Materials and Equipment[5]	2	3-5 acres per yard	10	10	0
Total Estimated Land Disturbance S8A MP 2.2 to 19.2			221.82	212.27	9.55
Chino Hills Route D from S8A MP 19.2 to New Switching Station					
Guard Pole Hole [6] (estimated qty main road crossings)	3	P/4(28"/12)**2x6 locs *1.5	0.003	0.003	0
Guard Pole Truck Damage [7] (same above)	3	2 tracks x10'x2'x6 locs	0.017	0.017	0
TSP Foundation Holes [8] (qty TSP)	12	=PI()*((60"/2)^2)	0.005	0	0.005
LST Footing Holes [9] (qty LST)	192	=PI()*((60"/2)^2)	0.069	0	0.069
LST Laydown and Assembly Area [10] (varies)	52	See note 9	41.093	41.093	0
Crane Pad for Erection (approx qty structures with slope)	52	40' X 50'	2.388	2.388	0
Wire Stringing Areas (pulling/tensioning/splicing) [14,15] (qty setups) <overlap demolition/new>	17	See notes 14 and 15	25.482	25.482	0
Roads New Access (qty miles)	0	L X 16' wide	0	0	0
Roads New Spur (qty miles) [13]	6.13	L X 16' wide	11.888	0	11.888
Roads Existing, <impacted areas of roads only> (qty miles)	20.53	L X 16' wide	39.816	39.816	0
Radius from access road to spur road (# Spur Roads Total)	40	50' R requires 1464 sq. ft.	1.344	0	1.344
Spur Rd Related Temp Disturbed Areas [11]	30	566 sq. ft per spur road	0.390	0.390	0
Additional Spur Rd Radius for LST haul Trucks [12]	30	2285 sq. ft. per spur road	1.574	1.574	0
Staging Areas for Materials and Equipment	1	5-10 acres per yard	10.00	10.00	0
Total Estimated Land Disturbance for Rerouted Portion of Alt 4D			134.07	120.76	13.31
Switching Station	1	10 acres temp 4-5 acres perm	10.00	5.00	5.00
Segment 8B - Chino Substation to Mira Loma Substation					
Guard Pole Hole [6] (estimated qty main road crossings)	27	P/4(28"/12)**2x6 locs *1.5	0.024	0.024	0
Guard Pole Truck Damage [7] (same above)	27	2 tracks x20'x2'x6 locs	0.298	0.298	0
LST Footing Holes (qty LST) TAN structures	22	=PI()*((48"/2)^2)	0.006	0	0.006
LST Footing Holes (qty LST) DE structures	15	=PI()*((60"/2)^2)	0.004	0	0.004
LST Laydown and Assembly Area	37	Varies	33.173	33.173	0
Crane Pad for Erection (approx qty structures with slope)	0	50' X 60'	0	0	0

Table 2.4-11. Alternative 4D Estimate of Land Disturbance – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station and Segment 8B: New Double-Circuit 220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Radius from access road to spur road (# Spur Roads Total)	15	50' R requires 1464 sq. ft.	0.504	0	0.504
Access Rd Related Temp Disturbed Areas [12]	15	566 sq. ft per spur road	0.195	0.195	0
Additional Access Rd Radius for LST Haul Trucks [13]	20	2285 sq. ft. per spur road	1.049	1.049	0
Wire Stringing Areas (pulling/tensioning/splicing) (qty setups) <overlap demolition/new>	7	Varies	10.79	10.79	0
Roads New Access (qty miles)	1.18	L X 16' wide	2.288	0	2.288
Roads Existing, <impacted areas of roads only> (qty miles)	3.31	L X 16' wide	6.419	6.419	0
Staging Areas for Materials and Equipment	1	10 acres	10.000	10.000	0
Total Estimated Land Disturbance for Segment 8B			64.75	61.95	2.80
Total Estimated Land Disturbance Alternative 4D (Seg 8A+8B)			~~365.89~~ 430.64	~~338.04~~ 399.98	~~27.86~~ 30.66
LAND DISTURBANCE RANGE (±20%)			~~292.7 – 439.1~~ 344.5 – 516.8	~~270.4 – 405.6~~ 320.0 – 480.0	~~22.3 – 33.4~~ 24.5 – 36.8

Source: SCE, 2008b – DR#4: Q4-46 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). SCE, 2009h - DR#9: Q3(b) for Segment 8B. For S8A MP 2.2 to 19.2, based on Table 2.2-9 (Alternative 2) – updated for Alternative 4D. New assumptions are provided below and footnoted in the table. All applicable previous assumptions are footnoted in Table 2.2-9 (above). Note: Numbers provided herein are preliminary and subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Estimated 49 street crossings between S8A MP 19.2 and 35.2 (Segments 8A, 8B, and 8C), which would not require guard structures due to re-route through CHSP (70 - 49 = 21).

2 Ratio from PEA based on mileage change [33 miles (Segment 8 starts at MP 2.2) vs. 19.2 miles].

3 SCE stated in DR#4: Q4-12 that 78 double-circuit structures (18 LSTs and 60 TSPs) would be eliminated from Segment 8 for Alternative 4.

4 Ratio number of crane pads by totally laydown/assembly areas (50 x 142/220)

5 Assume 2 staging area for first 19.2 miles of Segment 8.

6 Guard pole-assume three guard poles per each side of road = 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 20% more crossings present.

7 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

8 TSP-assume 60" dia x 30' depth with overbore for concrete backfill.

9 LST-assume 54" dia x 20" depth with overbore for concrete backfill.

10 LST and TSP structure layout, assembly and erection dimensions vary due to quantity of structures to be worked on located within immediate vicinity: =(100*200*1)+(150*200*27)+(200*200*24).

11 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2).

12 Difference between 80' radius and 80' radius from access to spur road for access by 80' trailer bed truck.

13 Spur road is required when access road is over 50' from structure site.

14 Setups site dimension vary due to terrain, with approx. 40% of a 200' x 400' site being disturbed: = (100*200*1)+(150*200*27)+(200*200*24).

15 Approximately every 7,500' and at points of inflection or DE structures when convenient.

Note: In addition to the 47 new DC 500-kV lattice structures, the re-route work at the new switching station site includes the replacing of 4 existing DC 220-kV suspension and dead-end lattice structures with 4 SC 220-kV 3-pole steel dead-end structure; the replacing of 2 existing DC 500-kV suspension lattice structures with dead-end structures; and the installation of 2 new DC 500-kV dead-end lattice structures outside the switching station area, all which are included as part of this project work. Also will be the replacing of a 220-kV lattice structure at the junction at the start of the line with another 220-kV lattice dead-end structure to move the wires out of the way for the new 500-kV wires and structures.

Table 2.4-12. Alternative 4D (S8A MP 19.2 to Switching Station) Estimate of Construction Waste – Segment 8A: New Double-Circuit 500-kV T/L and Switching Station

Waste Item	Pounds Total	Pounds Reusable At SCE Or On Site	Pounds Recyclable Outside SCE Or Disposed Of
Wood from Cribbing Etc.[1]	76,200 lbs	38,400 lbs	37,800 lbs
Cardboard Boxing[2]	15,000 lbs	0 lbs	15,000 lbs
Soil, Vegetation, and Crane Pads[3]	51,185 cu yd	48,625 cu yd	2,559 cu yd
Concrete Foundations[4]	23,588 lbs	0 lbs	23,588 lbs
Conductor and Shield Wire[5]	57,194 lbs	0 lbs	57,194 lbs
Lattice Towers and Tubular Steel Poles[6]	241,000 lbs	0 lbs	241,000 lbs
Miscellaneous	35,000 lbs	0 lbs	35,000 lbs
Sanitation Waste	35,758 lbs	0 lbs	35,758 lbs

Source: SCE, 2008b – DR#4: Q4-48 (July 2008) for S8A MP 19.2 (point of deviation from Alternative 2 to new switching station). Note: Numbers provided herein are based on preliminary engineering data and therefore are subject to change based on final engineering.

1 Wood cribbing attained from the job will be approximately 48,000 pounds for LST and 3,200 pounds for TSP shipping) calculated as follows: 47 LST's at approx. 126,970 pounds steel per LST and 1 LST at approx. 27,000 pounds steel per LST, and 4 TSP's at approx. 390,000 pounds steel per TSP / 50,000 pound capacity per truck = 128 loads @ 400 pounds cribbing per truck. Approximately 75% of the cribbing from the structures will be cut into 24" to 36" lengths for use on the assembly process and retained by the contractor. This leaves approximately 12,800 pounds to go to waste. Wood pallets from the job will be approximately 20 trucks with 15 pallets at 50 pounds each for a total of 15,000 pounds. Wood crates from the job will be approximately 20 trucks with 500 pounds crating each for a total of 10,000 pounds.

2 Cardboard boxing and crating from the job will be approximately 30 trucks with 500 pounds crating each for a total of 15,000 pounds.

3 Considering 5% spoils from foundations to be removed from site; 3.14=PI, (72"=diameter 500-LST with overbore, 24' depth LST hole = 47 LST's); (plus 36"=diameter 220-LST with overbore, 16' depth LST hole = 1 LST);(plus 72"=diameter 220-TSP with overbore, 24' depth TSP hole = 12 TSP). 100% spoils from road work and crane pads to remain at site; 32,361feet length new permanent spur roads, 16' wide = 47 new or extended spur roads estimated. 32,361' length permanent new spur roads. 40' by 50' crane pad, 2' deep = 47 estimated (utilizing existing pads at all locations practicable).

4 =concrete @ 5,300 lbs cu/yd x 30"d x 48"l x 4 removals (1-220kv sc LST); + 48"d x 48"l x 8 removals (2-220kv dc LST); + 30"d x 48"l x 4 removals (1-220kv sc LST).

5 =(220kV conductor @ 1.33 lbs per foot x 3 conductor x 200 feet = 798 lbs)+(500kV conductor @ 2.51 lbs per foot x 12 conductor x 1630 feet = 49,095 lbs)+(220kV conductor @1.33 lbs per foot x 6 conductor x 600 feet = 4,788 lbs)+(220kV shield wire @ .517 lbs per foot x 2 wire x 200 feet = 206 lbs)+(500kV shield wire @.517 lbs per foot x 2 wire x 1630 feet = 1,685 lbs)+(220kV shield wire @ .517 lbs per foot x 600 feet = 620 lbs) = total lbs 57,194 lbs / 30,000 per load = 2 loads.

6 =(220kV sc lattice structure @ 17,000 lbs per structure x 1 structure)+(220kV dc lattice structure @ 27,000 lbs per structure x 2 structures)+(500kV SC lattice structure @ 85,000 lbs per structure x 2 structure) = 241,000 lbs / 30,000 per load = 8 loads).

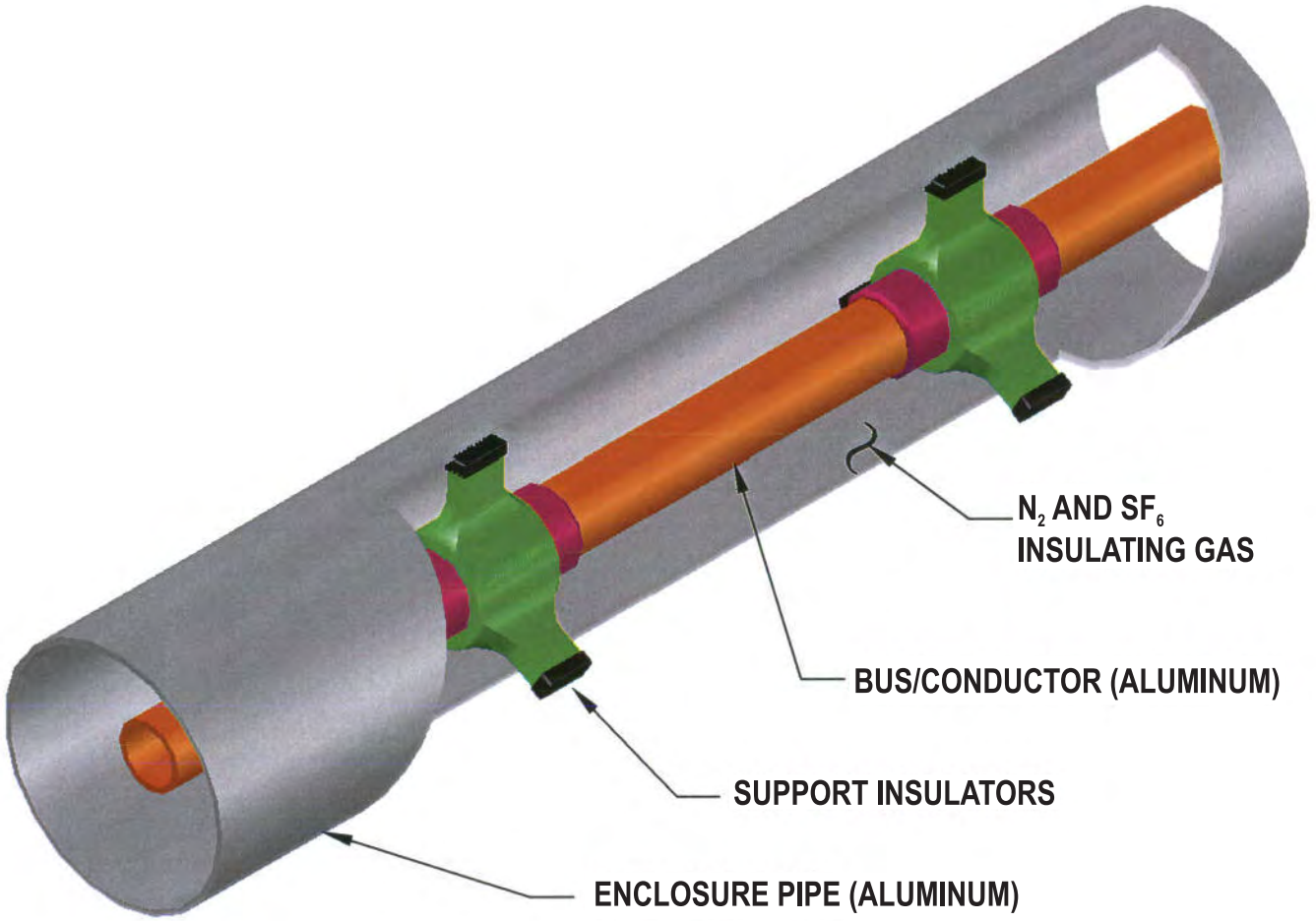
ALTERNATIVE 5

(PARTIAL UNDERGROUND ALTERNATIVE)

FIGURES

Figure 2.5-1

Partial Underground Alternative
Segment 8A - Chino Hills



Source: RW Beck, 2008.

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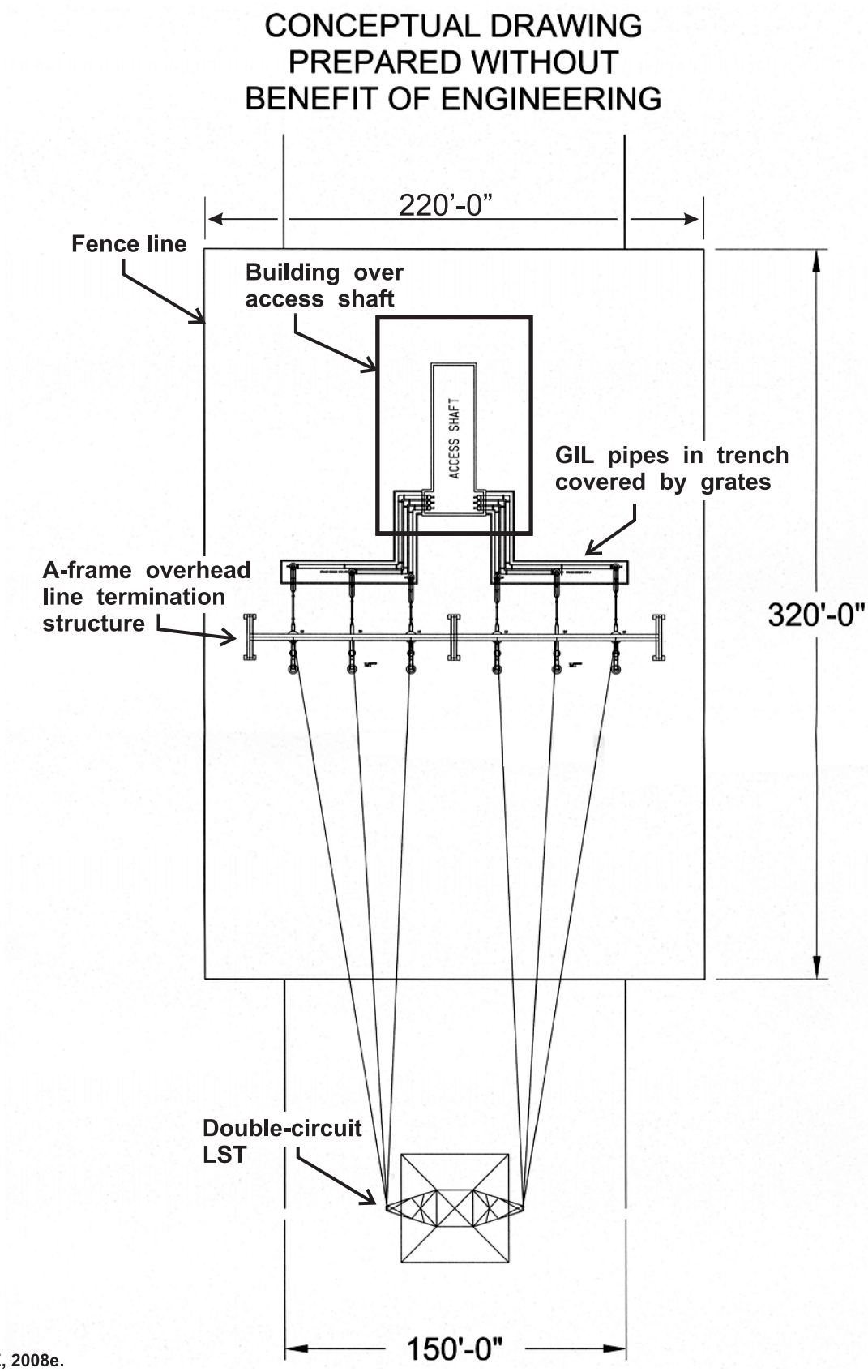
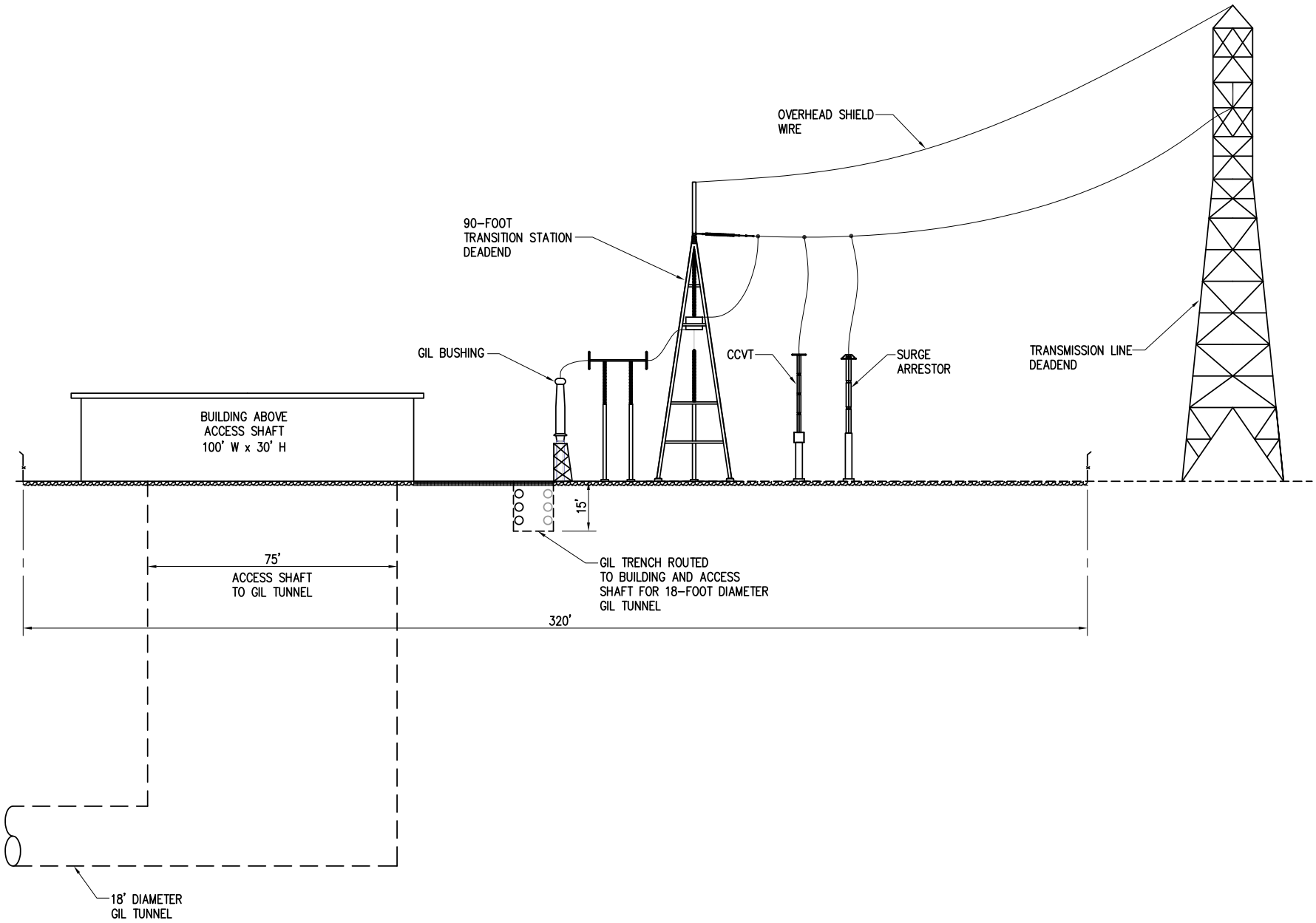
Figure 2.5-2
Typical GIL Enclosure Section



Source: SCE, 2008e.

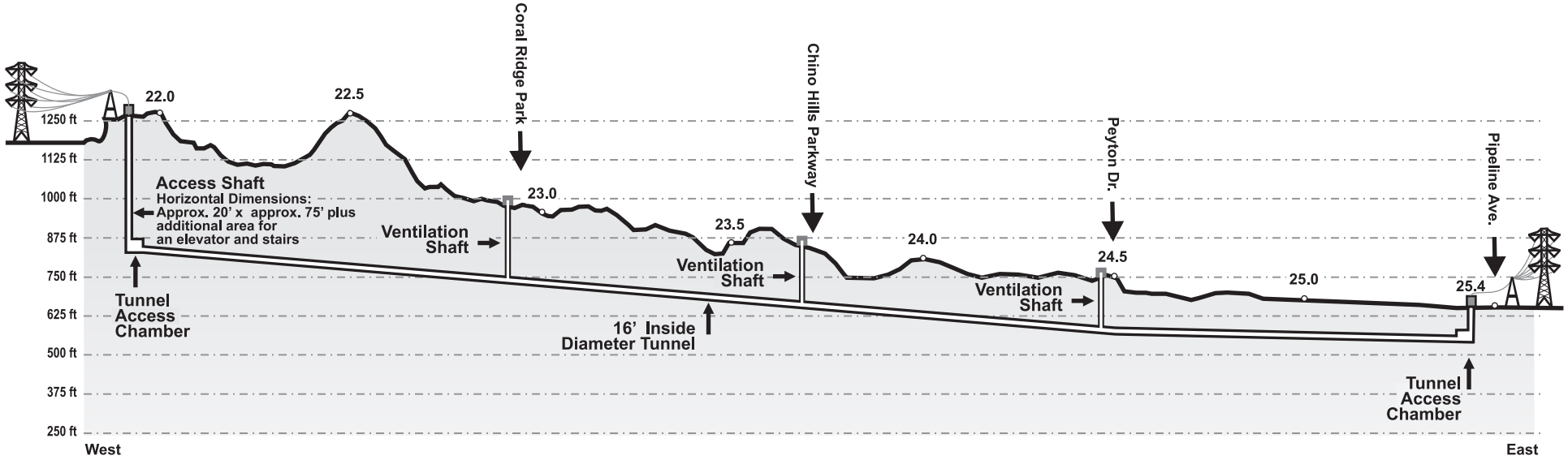
Figure 2.5-3
Conceptual Plan View of a 500-kV GIL Transition Station

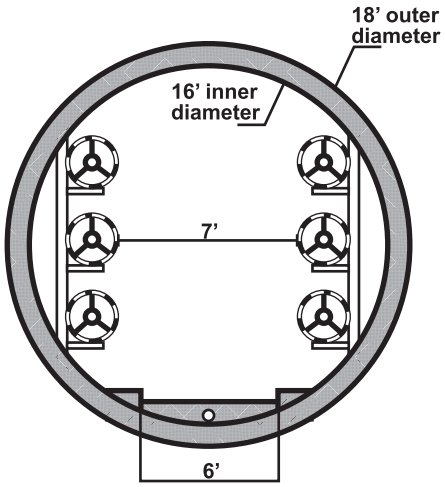


Source: RW Beck, 2008.

Figure 2.5-4
GIL Transition Station Side Elevation

Segment 8A MP 21.8 to 25.4





Note: Not to Scale

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Figure 2.5-5

Partial Underground - Side Elevation Along Segment 8A

ALTERNATIVE 5

(PARTIAL UNDERGROUND ALTERNATIVE)

TABLES

Table 2.5-1. Alternative 5 (Partial Underground) Estimate of Surface Land Disturbance – Segment 8: New Mira Loma – Vincent 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Guard Pole Hole [1] (qty street crossings on quad maps)	59	P/4(28"/12)**2x6 locs *1.5	0.05	0.05	0
Guard Pole Truck Disturbance (same above)	59	2 tracks x10'x2'x6 locs	0.33	0.33	0
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	20	(150' X 150')/2	5.17	5.17	0
TSP Foundation Holes [2] (qty TSP)	49	=PI()*((108"/2)^2)	0.06	0	0.06
TSP Pole Hole Truck Disturbance [2] (same above)	49	2 tracks x20'x2'	0.09	0.09	0
LST Footing Holes [3] (qty LST)	156	=PI()*((54"/2)^2)	0.04	0	0.04
LST Footings Truck Disturbance [3] (same above)	156	2 tracks x20'x2'x4 locs	1.15	1.15	0
LST and TSP Laydown and Assembly Area [4] (varies)	205	See note 7	162.76	162.76	0
Crane Pad for Erection (qty structures)	50	50' X 50'	2.87	2.87	0
Stringing Setups and Splicing Sites [5] (qty setups) <overlap demolition and new>	32	See notes 11 and 12	57.93	57.93	0
Roads New Access (qty miles) [6]	0	L X 16' wide	0	0	0
Roads New Spur (qty miles) [6]	6.1	L X 16' wide	11.83	0	11.83
Roads Existing, <impacted areas of roads only> (qty miles) [6]	41	L X 16' wide	79.52	79.52	0
Radius from access road to spur road (# Spur Roads Total) [6]	89	50' R requires 1464 sq. ft.	2.99	0	2.99
Spur Rd Related Temp Disturbed Areas[6]	30	566 sq. ft per spur road	0.39	0.39	0
Additional Spur Rd Radius for TSP and LST haul Trucks [6]	20	2285 sq. ft. per spur road	1.05	1.05	0
Staging Areas for Materials and Equipment	2-3	3-5 acres per yard	15	15	0
Transition Stations [7]	2	220' x 320' (1.62 acres perm.)	8.08	4.85	3.23
Ventilation System Shafts [8]	3	50' X 50' temp. 25' X 20' perm.	0.17	0.14	0.03
Marshalling Yard for Tunnel Boring [9]	1	20-30 acres	30	30	0
Total Estimated			379.5	361.3	18.2
LAND DISTURBANCE RANGE (±20%)			303.6 – 455.4	289.0 – 433.6	14.6 – 21.8

Source: Based on Table 2.2-9 - Updated for Alternative 5. Note: Numbers provided herein are preliminary and subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range. New assumptions are provided below and footnoted in the table. All applicable previous assumptions are footnoted in Table 2.2-9 (above).

1 Estimated 11 street crossings between S8A MP 21.9 and 25.4, which would not require guard structures due to underground construction.
2 Estimated 11 TSPs would be not installed between S8A 22.85 to 25.4 under Alternative 5 due to underground construction.
3 Estimated 4 LSTs would be not installed between S8A 21.9 to 22.85 under Alternative 5 due to underground construction.
4 Estimated 15 LST and TSPs would be not installed between S8A 21.9 to 25.4 under Alternative 5 due to underground construction.
5 Located approximately every 15,000 feet and at points of inflection or DE structures; therefore, assume for 3.5-mile underground segment one less site would be required.
6 Assume roads required along the underground portion are the same as proposed Project to access aboveground infrastructure such as ventilation system components.
7 For the western transition station, which is located in steep, hilly terrain, it has been assumed that the overall area of disturbance for cut/fill and stabilization of the area would be three times the final area (3 x permanent disturbance = 4.85 acres temporary disturbance).
8 Ventilation shaft buildings will be at least 25 feet long and 20 feet wide. A work area of 50-feet by 50-feet assumed for construction equipment.
9 Potential exists for use of warehouses for equipment storage; however, a worst-case has been assumed.

ALTERNATIVE 6

(MAXIMUM HELICOPTER CONSTRUCTION IN THE ANF ALTERNATIVE)

FIGURES

Legend

Roads on ANF
- Paved Road - to be used
- Maintenance Road
- Reconstruction Road
- New Road
- Private Road
- Forest Service Roads
- Helicopter Staging Areas
- 2.5 Mile Helicopter Buffer
- Pulling Sites
- Alternate Pulling Sites

Proposed Routes
- Segment 6
- Segment 11
- Substation
- Segment Milepost Marker

1" = ~1.5 miles

1:110,000

1 0 0.5 1 Miles

AVAQMD

SCAQMD

Angeles National Forest

Vincent

Gould

Goodrich

Angeles Forest Highway

Upper Big Tujunga Road

Figure 2.6-1 (Revised)

Candidate Helicopter Staging Areas in ANF Alternative 6

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ALTERNATIVE 6

(MAXIMUM HELICOPTER CONSTRUCTION IN THE ANF ALTERNATIVE)

TABLES

Table 2.6-1. Alternative 6 Helicopter Staging Areas for Construction of Towers Within the ANF		
Site #	Location (Proximity to the T/L)	Description of Site (Ownership / Existing Conditions / Accessibility)
1	Adjacent to the west of Angeles Forest Highway at the intersection with Mount Emma Road, approximately 0.1 mile east of S6 MP 3.0	Located on National Forest System (NFS) lands. Site is level and undeveloped. This area appears to have burned recently (based on site visit in June 2008); there is currently moderate vegetative cover, with possible invasive species beginning to establish. A rise of approximately 5 to 6 feet separates the site from Angeles Forest Highway. Direct access provided via Angeles Forest Highway, which would be temporarily restricted during helicopter operations.
2	Adjacent to the south of Aliso Canyon Road, 0.5 mile NW of Price Ranch Rd, within 0.1 mile to the east of S11 MP 3.75	Located on a private in-holding (this is a private site which SCE plans to use for Alternative 2 as a pulling/stringing site~~of the proposed Project, regardless of helicopter construction~~). Site is relatively level with vegetation cover. Scattered homes are nearby, to the south. Direct access provided via Aliso Canyon Road, which would be temporarily restricted during helicopter operations.
3	South of Aliso Canyon Road and east of Price Ranch Road, roughly equidistance between Segments 6 and 11	Located on NFS lands. Site is currently undeveloped with dense vegetation cover. Site is adjacent and to the north of Aliso Creek, and is in a ~~, a possible~~ Riparian Conservation Area (RCA). ~~, and may encroach upon the RCA buffer area.~~ Direct access provided via Aliso Canyon Road, which would be temporarily restricted during helicopter operations.
4	Along south side of a non-Forest system road, near where road ends. Approximately 0.15 mile north of Mt. Gleason Road, approximately 1.7 miles west of S11 MP 7.8	Located on NFS lands. The site appears to have been graded in the past and is relatively flat for those portions along the existing access road. The site drops off rapidly as you head down slope (west). The site is undeveloped except for a small weather station near the middle of the parcel. There is evidence of a past revegetation effort with some seedlings remaining. Site is long and narrow and stretches along southern side of road. On the northern side of the road are the remnants of a stone and concrete outbuilding of indeterminate age. Also on the north side of the road just east of the site is a water tank and associated buildings. There is a microwave tower at the intersection of the non-system access road and Mt. Gleason Road. Mt. Gleason Indian Paintbrush, a State-listed Rare and Forest Service Sensitive plant, was identified adjacent to the site.
5	Within 0.1 mile to the west of Forest Road 4N18 and 0.3 mile NW of Rabbit Peak, within 0.1 mile to the west of S6 MP 9.75	Located on NFS lands. This is a currently undeveloped area which is occupied by moderate vegetation and a population of medium- to mature pine trees. Access would be provided via a new temporary spur road from Forest Road 4N18, which would be temporarily restricted during helicopter operations.
6	Adjacent to the west of Upper Big Tujunga Canyon Road and 0.8 mile SE of Lynx Gulch, approximately 0.25 mile west of S6 MP 14.0	Located on NFS lands. This site is currently undeveloped and populated by moderate vegetation with some small- to medium-sized pine trees (natural growth). Site is currently fairly narrow, but could be expanded with grading. Slopes vary throughout the site. This site is near Lynx Gulch Road, a sensitive resource for multiple amphibian species. Site encroaches upon Big Tujunga Creek, located to the west. Access provided via Upper Big Tujunga Canyon Road, which would be temporarily restricted during helicopter operations. After improvements, the site would connect with Upper Big Tujunga Canyon Road via a new access road.
7	Barley Flats (former US Air Force Nike missile site), 0.5 mile north of Angeles ~~Forest~~ Crest Hwy and 1.75 miles west-NW of intersection with Upper Big Tujunga Canyon Rd, approximately 1.8 miles west of S6 MP 16.75	[Same as SCE#6B] Located on NFS lands. This is a split site which includes an existing helipad (operated and maintained by the Los Angeles County Sheriff's Department) located to the south of Barley Flats Road, used in conjunction with a portion of the former US Air Force Nike missile site known as "Barley Flats". The Barley Flats area encompasses two lots located at the western end of Barley Flats Road; because the western lot is currently occupied by numerous abandoned buildings which may have potential for Historical designation, only the eastern lot is included as part of this helicopter staging site. No existing structures in the western lot would be removed. The eastern lot of Barley Flats, as included in this split site, is currently bordered to the west by several small abandoned structures, to the north by mature natural-growth trees, to the east by what appears to be an abandoned stormwater detention basin, and to the south by an earth embankment and another abandoned structure (possibly an old office). The existing entrance to this lot is located in the southwestern corner. The Los Angeles County Sheriff's helipad that would be used in conjunction with the eastern Barley Flats lot is considered large enough to accommodate the sky crane required for helicopter construction. The helipad area is surrounded by mature trees, some of which may need to be removed to land the sky crane. Use of this site as a helicopter staging area would include helicopters and a sky crane landing at the helipad, with

Table 2.6-1. Alternative 6 Helicopter Staging Areas for Construction of Towers Within the ANF		
Site #	Location (Proximity to the T/L)	Description of Site (Ownership / Existing Conditions / Accessibility)
		tower laydown and assembly taking place at the eastern Barley Flats lot. Access provided via Barley Flats Road, which is accessed from Angeles Crest Highway (approximately 300 feet west of Upper Big Tujunga Canyon Road). Barley Flats Road is just over three miles long, heading in a west-northwest direction towards the proposed helicopter site. Barley Flats Rd is currently gated at Angeles Crest Highway.
8	Terraced area near Big Tujunga Dam approximately 0.15 mile west-southwest of Big Tujunga Canyon Road and S11 MP 14.5	Located on NFS lands. Site is a currently disturbed area, located on the plateau on top of a benched and graded hillside. The plateau is bounded to the east by Big Tujunga Canyon Road, to the north by a steep rocky slope, to the south by vegetated hills, and open space to the west (where the benched hillside stretches down into Big Tujunga Canyon). Direct access provided via Big Tujunga Canyon Road, which would be temporarily closed during helicopter operations.
9	Adjacent to Rincon-Redbox Road in the Newcomb Pass area, approximately 0.36 mile west of junction with Shortcut-Edison Road , just west of S6 MP 19.5	[Same as SCE#7] Located on NFS lands. Site is a currently disturbed area used by Forest Service fire personnel as a helicopter landing site. Site is relatively flat and in some areas supports large populations of nonnative grasses and Spanish broom. Mature oaks and potential spotted owl habitat surround the site. Native vegetation has recruited in many areas and includes California buckwheat, ceanothus, and manzanita. A small depression occurs near the middle of the site which collects seasonal rainfall. This area supports wetland plant species such as spikerush. Several recreational trails cross or pass near to the site, and are used extensively by recreationists during the summer months. Access to the site is via two points along Rincon-Redbox Road just west of the intersection with Shortcut-Edison Road.
10	Adjacent to the north of Angeles Forest Hwy, ~0.25 mile north of intersection with Big Tujunga Canyon Road, 0.8 mile east of S11 MP 13.25	Located on NFS lands. Site is an old, abandoned Forest Service overlook site that includes a flattened area (probably the old parking lot), some remnant retaining walls, and other stone/masonry walls. Above the flat area, there is a knob approximately 8 to 10 feet higher than the flat. The flat is covered with Spanish broom; the knob has brush and scattered trees. The site is accessible by an existing access road, but it is gated at the intersection of Angeles Forest Highway to prohibit vehicular access by the public.
11	West of Van Tassel Road, north of Duarte, west of S6 MP 26	[Same as SCE#8] Located on NFS lands. Site is adjacent to Forest Road 1N36, about 0.5 mile southwest of Mount Bliss. Roughly half of the site is disturbed due to the road, a dirt turnout, and a water tower. The remaining half is covered by native vegetation. A knoll near the center is covered by coastal sage scrub (dominated by California buckwheat and black sage), surrounded on all sides are chaparral (dominated by manzanita, ceanothus, and laurel sumac). There is a woodland of California bay laurel and canyon live oak immediately north of the site. *Quercus durata* var. *gabrielensis* (CNPS List 4.2) is present on the site. There is no potential for rare species in the disturbed portion of the site.
12	Roadside turnout adjacent to Angeles Forest Highway, east of S6 MP 6.6	Located on NFS lands. This is a roadside turnout adjacent to Angeles Forest Highway north of Mill Creek Summit Station. The site is an open graded road turnout approximately 0.60 acres in size. Transmission lines pass over the site. Much of the site is open with very little vegetative cover. The vegetation that does occur within the site includes non-native annual grasses and some native annuals and perennial herbs. The fill slope beneath the turnout is covered by rabbitbrush scrub. There is no natural habitat and minimal potential for special-status species to occur in the turnout area, but the surrounding natural vegetation has the potential to provide habitat for several special-status plants, including San Gabriel manzanita (*Arctostaphylos gabrielensis*), Plummer's mariposa lily (*Calochortus plummerae*), Mount Gleason Indian paintbrush (*Castilleja gleasonii*), San Gabriel Mountains sunflower (*Hulsea vestita subsp. gabrielensis*), short-jointed beavertail cactus (*Opuntia basilaris var. brachyclada*), chickweed oxytheca (*Oxytheca caryophylloides*), Transverse Range phacelia (*Phacelia exilis*), and Lemmon's syntrichopappus (*Syntrichopappus lemmonii*).
13	Existing helicopter landing area located off 3N17.4, east of S6 MP 7.5	Located on NFS lands. Existing helicopter landing area southeast of Mill Creek Summit Station. The site is a flat dirt area approximately 0.38 acres in size. The helipad has very minimal cover of non-native annual grasses surrounded by native vegetation. Vegetation on the site includes non-native annual grasses and some native herbs such as perennial woollystar and sandaster (*Corethrogyne filaginifolia*). Most of the surrounding vegetation is chaparral dominated by chamise, San Gabriel manzanita, chaparral whitethorn (*Ceanothus leucodermis*) and desert ceanothus (*Ceanothus greggii*). There also is a Coulter pine (*Pinus coulteri*) plantation adjacent to the site. San Gabriel manzanita is a CNPS list 1B.2 and Forest Service Sensitive plant. It was observed immediately adjacent to the helipad. There is

Table 2.6-1. Alternative 6 Helicopter Staging Areas for Construction of Towers Within the ANF		
Site #	Location (Proximity to the T/L)	Description of Site (Ownership / Existing Conditions / Accessibility)
		no natural habitat and minimal potential for special-status species to occur on the helipad site, but the surrounding natural vegetation has the potential to provide habitat for several special-status plants, including Plummer's mariposa lily, Mount Gleason Indian paintbrush, San Gabriel Mountains sunflower, short-jointed beavertail cactus, chickweed oxytheca, Transverse Range phacelia, and Lemmon's syntrichopappus.

Note: Site numbers correspond to those shown in Figure 2.6-1.

Table 2.6-2. Alternative 6 (Maximum Helicopter Construction in the ANF) Helicopter Trip Estimate					
Structure Type (Activity)	Number of Structures in ANF Using Helicopters	Minimum Helicopter Round Trips Per Tower	Maximum Helicopter Round Trips per Tower	Total Minimum Helicopter Round Trips	Total Maximum Helicopter Round Trips
Segment 6	92 (plus 2 wreck-out only) ~~74~~				
220-kV Suspension (Wreck Out) [1]	89~~70~~	55	89	4,895~~3,850~~	7,921~~6,230~~
220-kV Dead End (Wreck Out) [1]	5~~4~~	64	105	320~~256~~	525~~420~~
500-kV Suspension (Construct)	87~~70~~	146	194	12,702~~10,220~~	16,878~~13,580~~
500-kV Dead End (Construct) [2]	5~~4~~	380	480	1,900~~1,520~~	2,400~~1,920~~
Total Helicopter Round Trips Segment 6 =				19,817~~15,846~~	27,724~~22,150~~
Segment 11	56 (3 with no wreck-out required)				
220-kV Suspension (Wreck Out)	51	55	89	2,805	4,539
220-kV Dead End (Wreck Out)	2	64	105	128	210
500-kV Suspension (Construct)	54	146	194	7,884	10,476
500-kV Dead End (Construct) [2]	2	380	480	760	960
Total Helicopter Round Trips Segment 11 =				11,577	16,185
TOTAL Helicopter Round Trips (Segments 6 & 11) =				31,394~~27,423~~	43,909~~38,335~~

Source: SCE, 2008a; SCE, 2008c (DR#5 - Q14); GIS data provided by SCE.

[1] Wreck out towers for Segment 6 assumed to be one-for-one with replaced towers.

[2] Dead End towers determined based on May 30, 2008, Road Story. Segment 6 Dead End structures assumed to be Structures 29 (M6-T2), M6-T5, 42 (M9-T2), 49 (M11-T1), and 83 (M19-T4). Segment 11 Dead End Structures assumed to be Structures 16 and 17.

Table 2.6-3. Alternative 6 (Maximum Helicopter Construction in the ANF) Estimate of Land Disturbance – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L					
Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Gould – Vincent 500-kV T/L (NFS Lands)					
Towers Constructed by Helicopter	56				
Guard Structures (Qty = Pair)	8	2 X 50' x 150'	2.75	2.75	0.00
Tower Sites (Includes Tower wreck-out, Foundation Installation, Tower Assembly and Erection – including crane pads, Wire Installation) [5]	59	200' X 200'	37.37	23.83	13.54
Tower Sites (Tower wreck-out only) [1] (Newly disturbed area only)	3	(100' X100')/2	0.34	0.34	0.00

Table 2.6-3. Alternative 6 (Maximum Helicopter Construction in the ANF) Estimate of Land Disturbance – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Abandonment Of Existing Spur Roads [2] (Qty in Feet - To Tower Wreck-out Sites Only)	80	0	0.00	0.02	0.00
Wire Stringing Areas (pulling/tensioning/splicing) [9] (qty setups)	10	150' X 300'	10.33	10.33	0.00
Roads, New Access/Spur (qty miles) [3]	0.32~~6~~	L X 16' wide	0.611~~98~~	0.00	0.611~~98~~
Roads, Reconstruction (qty miles) [3]	8.56	L X 16' wide	16.60	0.00	16.60
Roads, Maintenance (qty miles) [3] (Impacted area of roads only)	7.0369~~8~~	L X 5' wide	4.263~~0~~	0.00	4.263~~0~~
Radius From Access Road to Spur Road [6]	3	50' radius=1464sq'	0.099	0.00	0.099
Staging Areas, Material and Equipment [4]	1	10 acres	10.00	10.00	0.00
Helicopter Staging/Support Areas [10]	3	4 acres (avg.)	15.58~~12.00~~	15.58~~12.00~~	0.00
Landing Pads [7]	56	40' X 40'	2.06	0.52~~2.06~~	1.54~~0.00~~
Support Yards [8]	6	100' X 100'	1.38	1.38	0.00
Total Estimated			101.4~~97.92~~	64.75~~62.69~~	36.65~~35.24~~
LAND DISTURBANCE RANGE (±15%)			86.2 – 116.6 ~~83.2 – 112.6~~		31.2 – 42.2 ~~30.0 – 40.5~~
New Structure Foundations – Spoils	244	Qty X 5' Dia X 35' Deep = Cu Yd	6,100.00	0.00	Hauled Away
Gould – Vincent 500-kV T/L (Non-NFS Lands)					
Towers Constructed by Helicopter	0				
Guard Structures (Qty = Pair)	5	2 X 50' X 150'	1.72	1.72	0.00
Tower Sites (Includes Tower wreck-out, Foundation Installation, Tower Assembly and Erection – including crane pads, Wire Installation)[5]	8	200' X 200'	7.34	5.50	1.84
Tower Sites (Tower wreck-out only) [1] (Newly disturbed area only)	1	(100' X100')/2	0.26	0.26	0.00
Abandonment Of Existing Spur Roads [2] (Qty in Feet - To Tower Wreck-out Sites Only)	0		0.00	0.00	0.00
Wire Stringing Areas (pulling/tensioning/splicing) [9] (qty setups)	6	Note 9	13.43	13.43	0.00
Roads, New Access/Spur (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Reconstruction (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Private/Maintenance (qty miles) [3] (Impacted area of roads only)	6.91~~7.12~~	L X 5' wide	4.193~~1~~	0.00	4.193~~1~~
Radius From Access Road to Spur Road [6]	7	50' radius=1464sq'	0.24	0.00	0.24
Staging Areas, Material and Equipment [4]	4	9.5 acres	40.0	40.0	0.00
Helicopter Staging/Support Areas [10]	1	4 acres (avg.)	4.00	4.00	0.00
Landing Pads [7]	0	40' X 40'	0.00	0.00	0.00
Support Yards [8]	2	100' X 100'	0.46	0.46	0.00
Total Estimated			71.64~~77~~	65.37	6.27~~39~~
LAND DISTURBANCE RANGE (±15%)			60.9 – 82.4 ~~61.0 – 82.5~~		5.3 – 7.2 ~~5.4 – 7.4~~
New Structure Foundations – Spoils	36	Qty X 5' Dia X 35' Deep = Cu Yd	900.0	0.00	Hauled Away
Gould-Mesa 220-kV T/L (NFS Lands)					
Guard Structures (Qty = Pair)	4	2 X 50' X 100'	2.75	2.75	0.00
~~Lattice Tower Sites for Mesa - Vincent 220 kV T/L at Gould Sub. (Includes Foundation Installation, Tower Assembly and Erection - Wire Installation)~~	~~5~~	~~200' X 200'~~	~~4.59~~	~~4.13~~	~~0.46~~

Table 2.6-3. Alternative 6 (Maximum Helicopter Construction in the ANF) Estimate of Land Disturbance – Segment 11: New Mesa – Vincent (Via Gould) 500/220-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
~~Structure Sites for Eagle Rock - Gould 220 kV T/L at Gould Sub. (Includes Foundation Installation, Tower Assembly and Erection – iWire Installation)~~	~~5~~	~~160' X 200'~~	~~3.67~~	~~3.31~~	~~0.37~~
Wire Stringing Areas (pulling/tensioning/splicing) [9] (qty setups)	1	150' X 300'	1.03	1.03	0.00
Roads, New Access/Spur (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Reconstruction (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Maintenance (qty miles) [3] (Impacted area of roads only)	0	L X 5' wide	0.00	0.00	0.00
Radius From Access Road to Spur Road,	0	50' radius=1464sq'	0.00	0.00	0.00
Staging Areas, Material and Equipment	0	10 acres	0.00	0.00	0.00
Total Estimated			3.78~~12.04~~	3.78~~11.21~~	0.00~~0.83~~
LAND DISTURBANCE RANGE (±15%)			3.2 – 4.3 ~~10.2 – 13.8~~		0.00 ~~0.7 – 1.0~~
~~New Structure Foundations - Spoils on Mesa - Vincent 220 kV T/L at Gould Sub.~~	~~5~~	~~Qty X 120 Cu Yd~~	~~600.00~~	~~0.00~~	~~Hauled Away~~
~~New Structure Foundations - Spoils on Gould – Eagle Rock 220 kV T/L at Gould Sub.~~	~~5~~	~~Qty X 120 Cu Yd~~	~~600.00~~	~~0.00~~	~~Hauled Away~~
Gould-Mesa 220-kV T/L (Non-NFS Lands)					
Guard Structures (Qty = Pair)	57	2 X 50' X 100'	13.09	13.09	0.00
Tower Sites (Wire Installation Only)	68	No Disturbance	0.00	0.00	0.00
Tower Sites - # 104 (Includes Foundation Installation, Tower Assembly and Erection – including crane pads, Wire Installation)	1	200' X 200'	0.92	0.87	0.05
Lattice Tower Sites for Mesa - Vincent 220 kV T/L at Gould Sub. (Includes Foundation Installation, Tower Assembly and Erection –Wire Installation)	5	200' X 200'	4.59	4.13	0.46
Structure Sites for Eagle Rock - Gould 220 kV T/L at Gould Sub. (Includes Foundation Installation, Tower Assembly and Erection – iWire Installation)	5	160' X 200'	3.67	3.31	0.37
Wire Stringing Areas (pulling/tensioning/splicing) [9] (qty setups)	19	150' X 300'	19.63	19.63	0.00
Roads, New Access/Spur (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Reconstruction (qty miles) [3]	0	L X 16' wide	0.00	0.00	0.00
Roads, Private/Maintenance (qty miles) [3] (Impacted area of roads only)	0	L X 5' wide	0.00	0.00	0.00
Radius From Access Road to Spur Road	0	50' radius=1464sq'	0.00	0.00	0.00
Staging Areas, Material and Equipment	0	10 acres	0.00	0.00	0.00
Total Estimated			41.90~~33.64~~	41.03~~33.59~~	0.88~~0.05~~
LAND DISTURBANCE RANGE (±15%)			35.6 – 48.2 ~~28.6 – 38.7~~		0.7 – 1.0 ~~0.0 – 0.1~~
New Structure Foundations – Spoils #104	4	Qty X 5' Dia X 35' Deep = Cu Yd	100.00	0.00	Hauled Away
New Structure Foundations - Spoils on Mesa - Vincent 220 kV T/L at Gould Sub.	5	Qty X 120 Cu Yd	600.00	0.00	Hauled Away
New Structure Foundations - Spoils on Gould – Eagle Rock 220 kV T/L at Gould Sub.	5	Qty X 120 Cu Yd	600.00	0.00	Hauled Away

Source: Based on Table 2.2-6 – Updated for Alternative 6. Note: Numbers provided herein are preliminary and subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Previously disturbed portions of existing 220 kV tower site locations that were left as permanent disturbance were not counted as construction disturbance in this calculation.

2 Spur roads to and tower site landing at existing 220 kV tower sites that are not designated as new 500 kV tower sites would be restored and abandoned.

3 Definitions of road categories (maintenance, reconstruction, and new) are provided in Section 3.13 (Traffic and Transportation). Access roads and spur roads would be stabilized for drainage at the end of construction and left serviceable for the maintenance of the power line. Common access roads near Vincent Substation (Private – Non-NFS) have been included as part of Segment 11.

4 Assume material and equipment distributed along the ROW as the work progresses.

5 For helicopter constructed towers, disturbance would not include assembly & erection areas or crane pads (Assume 0.24 acres per laydown/assembly area per Segment 6 [32.5acres/135 structures] and 0.06 acres per crane pad [50'x50'] per Segment 6 = Total reduction of 0.3 acres per heli tower). Area of permanent disturbance does not change. Land disturbance assumes conventional construction techniques for new footing installation; however, micropiles may be utilized where appropriate, feasible, and/or cost effective.

6 The number of total spur roads is assumed to be proportional to the quantity of structures constructed utilizing ground-based operations ratioed from the PEA, where 61 structures are constructed utilizing ground-based operations resulting in 60 total spurs.

7 Assume typical landing pad (40'x40') for every tower constructed by helicopter, of which 75 percent would be considered permanent to support operations and maintenance activities.

8 Assume 2 small support yards for personnel drop-off/pick-up, emergency landing, etc. per large helicopter staging/support area.

9 Assume average wire stringing site area of 150'x300' per GIS data; except for one site located off NFS lands near Vincent Substation, which is estimated to be approximately 1,200'x300'.

10 Average helicopter staging/support area of 4 acres assumed for most staging areas, although the size could range substantially depending on land available and intended use. For example, an exception to this assumption includes Site #8 (on NFS lands), which is estimated to be 7.58 acres.

Table 2.6-4. Alternative 6 (Maximum Helicopter Construction in the ANF) Estimate of Land Disturbance – Segment 6: Rio Hondo – Vincent No. 2 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Rio Hondo – Vincent No. 2 500-kV T/L (NFS lands)					
Towers Constructed by Helicopter	92~~87~~				
Guard Pole Hole [1] (qty street crossings on quad maps)	2	P/4(28"/12)**2x6 locs *1.2	0.002	0.002	0.00
Guard Pole Truck Disturbance [2] (same above)	2	2 tracks x10'x2'x6 locs	0.011	0.011	0.00
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	8	(150' X 150')/2	2.07	2.07	0.00
TSP Foundation Holes [3] (qty TSP)	6	=PI()*((108"/2)^2)	0.007	0.00	0.007
TSP Pole Hole Truck Disturbance [4] (same above)	6	2 tracks x20'x2'	0.011	0.011	0.00
LST Footing Holes [5] (qty LST)	99	=PI()*((54"/2)^2)	0.029	0.00	0.029
LST Footings Truck Disturbance [6] (same above)	7~~12~~	2 tracks x20'x2'x4 locs	0.05~~188~~	0.05~~188~~	0.00
LST and TSP Laydown and Assembly Area [7] (varies)	13~~8~~	See note 7	3.13~~4.34~~	3.13~~4.34~~	0.00
Crane Pad for Erection (qty structures)	13~~8~~	50' X 50'	0.75~~1.03~~	0.75~~1.03~~	0.00
Wire Stringing Areas (pulling/tensioning/splicing) [11.12] (qty setups) <overlap demolition/new>	16	See note 11	13.99	13.99	0.00
Roads, New Access/Spur (qty miles) [10]	0.464~~0.303~~	L X 16' wide	0.900~~587~~	0.00	0.900~~587~~
Roads, Reconstruction (qty miles)	3.983~~4.268~~	L X 16' wide	7.72~~8.28~~	0.00	7.72~~8.28~~
Roads, Maintenance (qty miles) (impacted areas of roads only)	27.34~~98~~	L X 5' wide	16.57~~96~~	0.00	16.57~~96~~
Radius from access road to spur road (# Spur Roads Total) [13]	7~~10~~	50' R requires 1464 sq. ft.	0.237~~0.329~~	0.00	0.237~~0.329~~
Spur Rd Related Temp Disturbed Areas[8]	9~~13~~	566 sq. ft per spur road	0.122~~0.168~~	0.122~~0.168~~	0.00

Table 2.6-4. Alternative 6 (Maximum Helicopter Construction in the ANF) Estimate of Land Disturbance – Segment 6: Rio Hondo – Vincent No. 2 500-kV T/L

Project Feature	Quantity	Disturbed Acreage Calculation	Acres Disturbed During Construction	Acres to be Restored	Acres Permanently Disturbed
Additional Spur Rd Radius for TSP and LST haul Trucks [9]	5~~7~~	2285 sq. ft. per spur road	0.247~~0.342~~	0.247~~0.342~~	0.00
Staging Areas for Materials and Equipment	2	3-5 acres per yard	10.00	10.00	0.00
Helicopter Staging/Support Areas [16]	9~~7~~	4 acres (avg.)	26.83~~28.00~~	26.83~~28.00~~	0.00
Landing Pads [14]	92~~87~~	40' X 40'	3.379~~196~~	0.845~~3.196~~	2.534~~0.00~~
Support Yards [15]	18~~4~~	100' X 100'	4.132~~3.214~~	4.132~~3.214~~	0.00
Total Estimated			90.19~~92.65~~	62.19~~66.46~~	28.00~~26.19~~
LAND DISTURBANCE RANGE (±15%)			76.7 – 103.7 ~~78.8 – 106.6~~		23.8 – 32.2 ~~22.3 – 30.1~~
Rio Hondo – Vincent No. 2 500-kV T/L (Non-NFS lands)					
Towers Constructed by Helicopter	0				
Guard Pole Hole [1] (qty street crossings on quad maps)	1	P/4(28"/12)**2x6 locs *1.2	0.001	0.001	0.00
Guard Pole Truck Disturbance [2] (same above)	1	2 tracks x10'x2'x6 locs	0.006	0.006	0.00
Tower Sites (Tower wreck-out only) (Newly disturbed area only)	6	(150' X 150')/2	1.55	1.55	0.00
TSP Foundation Holes [3] (qty TSP)	24	=PI()*((108"/2)^2)	0.028	0.00	0.028
TSP Pole Hole Truck Disturbance [4] (same above)	24	2 tracks x20'x2'	0.044	0.044	0.00
LST Footing Holes [5] (qty LST)	9	=PI()*((54"/2)^2)	0.003	0.00	0.003
LST Footings Truck Disturbance [6] (same above)	9	2 tracks x20'x2'x4 locs	0.066	0.066	0.00
LST and TSP Laydown and Assembly Area [7] (varies)	33	See note 7	7.95	7.95	0.00
Crane Pad for Erection (qty structures)	33	50' X 50'	1.89	1.89	0.00
Wire Stringing Areas (pulling/tensioning/splicing) [11.12] (qty setups) <overlap demolition/new>	3	See note 11	3.10	3.10	0.00
Roads, New Access/Spur (qty miles) [10]	0	L X 16' wide	0.00	0.00	0.00
Roads, Reconstruction (qty miles) [10]	0~~.170~~	L X 16' wide	0.00330	0.00	0.00330
Roads, Maintenance (qty miles) [10] (impacted areas of roads only)	0.062	L X 5' wide	0.038	0.00	0.038
Roads, Private (qty miles) [10] (impacted areas of roads only)	2.42~~3~~	L X 5' wide	1.47	0.00	1.47
Radius from access road to spur road (# Spur Roads Total) [13]	18	50' R requires 1464 sq. ft.	0.603	0.00	0.603
Spur Rd Related Temp Disturbed Areas[8]	24	566 sq. ft per spur road	0.308	0.308	0.00
Additional Spur Rd Radius for TSP and LST haul Trucks [9]	12	2285 sq. ft. per spur road	0.627	0.627	0.00
Staging Areas for Materials and Equipment	2	3-5 acres per yard	10.00	10.00	0.00
Helicopter Staging/Support Areas	0	4 acres (avg.)	0.00	0.00	0.00
Landing Pads [14]	0	40' X 40'	0.00	0.00	0.00
Support Yards [15]	0	100' X 100'	0.00	0.00	0.00
Total Estimated			27.69~~28.03~~	25.55	2.14~~47~~
LAND DISTURBANCE RANGE (±15%)			23.5 – 31.8 ~~23.8 – 32.2~~		1.8 – 2.5 ~~2.1 – 2.9~~

Source: Based on Table 2.2-7 – Updated for Alternative 6. Note: Numbers provided herein are preliminary and subject to change based on final engineering. To best assess the environmental impacts, a range has been developed whereby the assessment of impacts provided in the EIR/EIS covers the shown range.

1 Guard pole-assume two guard poles per each side of street thus 6 poles for each crossing for standard 'double H' design, 28" diameter poles, assume that 50% more crossings present (1.5 multiplier) due to preliminary engineering undercrossings not showing mapped distribution, dirt roads and jeep trails.

2 Guard pole-augering process, same as above plus, assume 'dualie' type rear axle trucks with two 2' wide tracks backing to location.

3 TSP-assume 96" dia x 35' depth with overbore for concrete backfill based on conventional footing construction.

4 TSP-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to one locations per TSP approx. 20" from stub road.

5 LST-assume 42" dia x20' depth with overbore for concrete backfill based on conventional footing construction.

6 LST-assume 'dualie' type rear axle trucks with two 2' wide tracks backing to four locations per LST approx. 20" from stub road. Total number is reduced by the number of towers to be constructed by helicopter.

7 LST and TSP structure layout, assembly and erection dimensions vary due to quantity of structures to be worked on located within immediate vicinity =(150*150*99)+(200*200*13)+(250*300*2)+(200*250)+(250*250)+(150*250)+(150*300). Total area from PEA (32.54 acres) based on ground-based construction of 135 structures. Ratioed acreage based on reduced number of ground-based constructed structures.

8 Parking tracks for 3 utility trucks (180 ft^2), and one turnaround track on an 18' radius (386 ft^2). Assume spur road temporary disturbance is proportional to the quantity of structures constructed utilizing ground-based operations.

9 Difference between 80' radius and 80' radius from access to spur road for access by 80' trailer bed truck. Assume additional spur road radius for TSP & LST Haul Trucks is proportional to the quantity of structures constructed utilizing ground-based operations.

10 Definitions of road categories (maintenance, reconstruction, and new) are provided in Section 3.13 (Traffic and Transportation). Access roads and spur roads would be stabilized for drainage at the end of construction and left serviceable for the maintenance of the power line. Common access roads near Vincent Substation (Private – Non-NFS) have been included as part of Segment 11. Spur road is required when access road is over 50' from structure site.

11 Setups site dim vary due to terrain. The 16 wire stringing sites on NFS lands, as identified in the GIS data, are assumed to have the following dimensions (as detailed in the PEA):
=(400*200*2)+(400*100*5)+(550*100)+(250*100)+(400*100+3650)+(150*100*2)+(300*100+5525)+(300*100*2). The additional wire stringing sites located off NFS lands in Segment 6 (3 total) are assumed to be 150'x300' per the GIS data.

12 Approximately every 15,000' and at points of inflection or dead-ends.

13 The number of total spur roads is assumed to be proportional to the quantity of structures constructed utilizing ground-based operations ratioed from the PEA, where 138 structures are constructed utilizing ground-based operations resulting in 75 total spurs.

14 Assume typical landing pad (40'x40') for every tower constructed by helicopter, of which 75 percent would be considered permanent to support operations and maintenance activities.

15 Assume 2 small support yards for personnel drop-off/pick-up, emergency landing, etc. per large helicopter staging/support area.

16 Average helicopter staging/support area of 4 acres assumed for most staging areas, although the size could range substantially depending on land available and intended use. For example, exceptions to this assumption include the following sites located on NFS lands: Site #7 (1.85 acres), Site #12 (0.60 acres), and Site #13 (0.38 acres).

Table 2.6-5. Inconsistencies with Established Scenic Integrity Objectives ~~Amendments to~~ of the 2005 Forest Plan for Alternative 6 (Maximum Helicopter Construction in the ANF)	
~~Forest Plan~~Project Elements	Inconsistencies with Established Scenic Integrity Objectives (SIO)
Alternative 6 Maximum Helicopter Construction in the ANF (~~Changes required inside rights of way in ANF f~~For Segments 11 and 6 within the ANF)	Segment 11: *~~High SIO changed to~~An Unacceptably Low Level of Scenic Integrity would occur in an area designated as High SIO for a total of 5.2 miles (A drop of 4 Levels)* (from MP 19.2 to 19.7 and MP 19.8 to 24.5) *~~High SIO changed to~~ A Very Low SIO would occur in an area designated as High SIO for a total of 2.0 miles (A drop of 3 Levels)* (from MP 1.5 to 2.25 and MP 3.0 to 4.25) *~~High SIO changed to~~A Low SIO would occur in an area designated as High SIO for a total of 12.85 miles (A drop of 2 Levels)* (from MP 4.75 to 6.8, MP 6.9 to 8.25, MP 8.25 to 8.7, MP 9.9 to 11.3, MP 11.5 to 14.75, MP 14.75 to 15.2, and MP 15.3 to 19.2) *~~High SIO changed to~~A Moderate SIO would occur in an area designated as High SIO for a total of 0.75 mile (A drop of 2 Levels)* (from MP 2.25 to 3.0) [1] *~~Moderate SIO changed to~~An Unacceptably Low Level of Scenic Integrity would occur in an area designated as Moderate SIO for a total of 0.1 mile (A drop of 4 Levels)* (from MP 19.7 to 19.8) *~~Moderate SIO changed to~~A Very Low SIO would occur in an area designated as Moderate SIO for a total of 0.1 mile (A drop of 3 Levels)* (from MP 6.8 to 6.9) *~~Moderate SIO changed to~~A Low SIO would occur in an area designated as Moderate SIO for a total of 1.5 miles (A drop of 2 Levels)* (from MP 8.7 to 9.9, MP 11.3 to 11.5, and MP 15.2 to 15.3) [1] *Total in Segment 11 = 22.5 miles* Segment 6: *~~High SIO changed to~~An Unacceptably Low Level of Scenic Integrity would occur in an area designated as High SIO for a total of 13.6~~11.0~~ miles (A drop of 4 Levels)* (from MP 1.4 to 8.0, MP 8.0 to 10.6, MP 13.1 to 13.5, and MP 13.6 to 17.6) *~~High SIO changed to~~A Very Low SIO would occur in an area designated as High SIO for a total of 1.1~~3.7~~ miles (A drop of 3 Levels)* (from ~~8.0 to 10.6,~~ MP 10.8 to 11.5, and MP 17.6 to 18.0) *~~High SIO changed to~~A Low SIO would occur in an area designated as High SIO for a total of 6.6~~4.2~~ miles (A drop of 2 Levels)* (from MP 11.5 to 12.1, MP 12.3 to 13.1, MP 19.0 to 21.4, and MP 24.1 to 26.9) *~~High SIO changed to~~A Moderate SIO would occur in an area designated as High SIO for a total of 3.7~~6.1~~ miles (A drop of 1 Level)* (from MP 18.0 to 19.0~~, MP 19.0 to 21.4,~~ and MP 21.4 to 24.1) [1] *~~Moderate SIO changed to~~An Unacceptably Low Level of Scenic Integrity would occur in an area designated as Moderate SIO for a total of 0.1 mile (A drop of 4 Levels)* (from MP 13.5 to 13.6) *~~Moderate SIO changed to~~A Very Low SIO would occur in an area designated as Moderate SIO for a total of 0.2 mile (A drop of 3 Levels)* (from MP 10.6 to 10.8) *~~Moderate SIO changed to~~A Low SIO would occur in an area designated as Moderate SIO for a total of 0.2 mile (A drop of 2 Levels)* (from MP 12.1 to 12.3) [1] *Total in Segment 6 = 25.5 miles* TOTAL IN SEGMENTS 6 AND 11 = 48.0 MILES

Note:

[1] The Forest Supervisor may approve a project in the ANF ~~that would lower the Scenic Integrity Objectives level~~ without a Forest Plan amendment, as long as the SIO decrease would not be greater than one SIO level (for instance if a project would achieve a Moderate SIO in an area designated for a High SIO).

The following Forest-specific Design Criteria and Place-specific Standards are applicable to the Project:

- ANF S1 - Pacific Crest Trail - Protect scenic integrity of foreground views as well as from designated viewpoints. Where practicable, avoid establishing nonconforming land uses within the viewshed of the trail (Liebre-Sawmill, Santa Clara Canyons, Soledad Front Country and Angeles High Country). (p. 76)
- S9: Design management activities to meet the Scenic Integrity Objectives (SIOs) shown on the Scenic Integrity Objectives Map.
- S10: Scenic Integrity Objectives will be met with the following exceptions: (1) Minor adjustments not-to-exceed a drop of one SIO level is allowable with the Forest Supervisor's approval. (2) Temporary drops of more than one SIO level may be made during and immediately following project implementation providing they do not exceed three years in duration.

Table 2.6-6. RCA Crossing Points Summary – Alternative 6 (Maximum Helicopter Construction in the ANF)

Drainage Type	Crossing Type	Total	Non-conformity to Forest Plan
ROAD CROSSINGS			
Perennial	Paved Arizona	2	2
Intermittent	Arizona	18	16
	Paved Arizona	1	1
	CMP	4	4
	Concrete Culvert	1	1
Ephemeral	Arizona	51	27
	Paved Arizona	2	2
	CMP	7	4
	Subtotal	86	57
LINE CROSSINGS*			
Perennial	N/A	7	0
Intermittent	N/A	63	0
Ephemeral	N/A	26	0
	Subtotal	96	0
HELICOPTER STAGING AREAS			
Perennial	N/A	1	1
	Subtotal	1	1
	Total	~~182~~183	~~57~~58

*Line crossings were determined by aerial photography.

*Line crossings were determined by aerial photography and are indicated as such in Figure 3.4-6 (located in the Map & Figure Series Volume).

ALTERNATIVE 7

(66-KV SUBTRANSMISSION ALTERNATIVE)

FIGURES

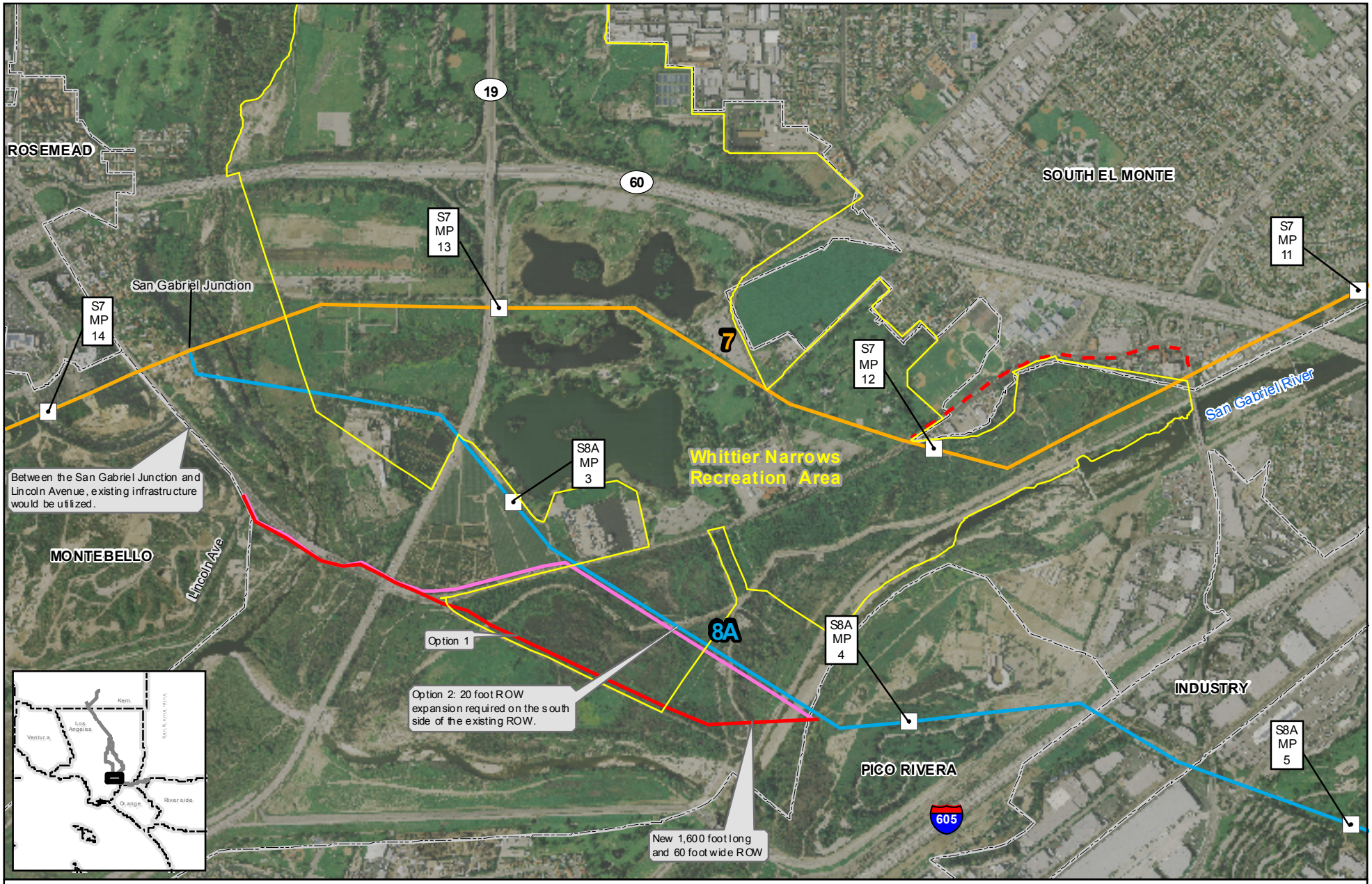
Figure 2.7-1

Aspen Environmental Group

Alternative 66-kV Underground
Proposed Project 66-kV Overhead
Proposed Project 500-kV T/L
Mileposts
Duck Farm (Phase 1)
City Boundary

Alternative 7: Duck Farm 66-kV Underground

0 750 1,500 Feet



Aspen Environmental Group

Figure 2.7-2 (Revised)

Alternative 7: Whittier Narrows 66-kV Underground and Overhead Re-Routes

CUMULATIVE PROJECTS

FIGURES

Substations

Proposed Routes

- Segment 4
- Segment 5
- Segment 6
- Segment 7
- Segment 8A
- Segment 8B
- Segment 8C
- Segment 10
- Segment 11
- West Lancaster Alternative
- 2-mile Buffer

1" = 2 miles

1:126,720

0 0.45 0.9 1.8 2.7 Miles

Kern County Wind Energy Projects

PdV Wind Energy Project
- 6,435-acre proposed site located in Willow Springs
- 300 MW project includes construction of 300 wind turbines, a substation, switching station, access roads, and transmission lines
- Would interconnect to the Cottonwind Substation (Segment 4).

Alta-Oak Creek Mojave Project
- 50-square mile site in the Tehachapi area
- 1,500 MW project includes 750 turbines

Pine Tree Wind Development Project (beyond mapped area)
- 8,000-acre site located 12 miles north of the community of Mojave.
- 120 MW project includes construction of 80 wind turbines, meteorological towers, a substation, 1.1 miles of a transmission line, a switching station, an operation and maintenance building, and access roads.

Pine Canyon Wind Project (beyond mapped area)
- 12,000-acre site adjacent to the Pine Tree Wind Development Project
- Proposed 150 MW of wind energy

Tehachapi
Substation two
Windhub (Substation one)
Mojave
10
Cottonwind
Whirlwind
Rosamond
Kern
4
Los Angeles
138
Antelope Valley Poppy Preserve
Lancaster
Antelope

- CA High Speed Rail
- El Paso Line 1903 Conversion Project
- Antelope Segments 2 & 3 Project
- Antelope-Pardee Project
- Barren Ridge Project
- Willow Springs Specific Plan
- Alta-Oak Creek Mojave Project
- PdV Wind Energy Project

Aspen Environmental Group

Figure 2.9-1a

TRTP Cumulative Projects by Jurisdiction

October 2009

Substations

Proposed Routes
- Segment 4
- Segment 5
- Segment 6
- Segment 7
- Segment 8A
- Segment 8B
- Segment 8C
- Segment 10
- Segment 11
- West Lancaster Alternative

2-mile Buffer

1" = 2.5 miles
1:158,400

0 2.5 5 Miles

Maglev
CA High Speed Rail
Antelope Segments 2 & 3 Project
Antelope-Pardee Project
Barren Ridge Project
Palmdale Hybrid Power Project
Quail Valley Annexation and Development Plan (approx. 4,500 acres)
City Ranch (known as Ana Verde)
- 3,715 single-family lots (includes 350 single-family units in Ana Verde)
- 1 commercial lot (3 acres total)
- Open Space - 50 lots (12 acres); School - 1 lot
- Fire Station - 1 lot
- Palmdale Hybrid Power Project – A 570-MW project consisting of natural gas and solar thermal generating equipment, and a 35.6-mile T/L that would connect to Vincent Substation

Ritter Ranch Master Planned Community
- 9,798 single-family lots (approx. 4,500 acres total)
- 1 commercial project; 9 industrial lots; (3 acres total)
- Park/Open Space - 2 lots; School - 2 lots

Quartz Hill
- 21 single-family lots; 75 senior housing units

Unincorporated Los Angeles County
AV Solar Ranch One Project – A 230-MW solar photovoltaic facility proposed on approximately 2,100 acres of land located northwest of the City of Lancaster

Leona Valley (Unincorporated L.A. County)
- 131 residential lots

Vincent
Antelope
Lancaster
Palmdale
Quartz Hill
Desert View Highlands
Acton
Angeles National Forest
Glendale
Los Angeles
Los Angeles Aqueduct
5
14
138
2
4
6
11
210

Figure 2.9-1b (Revised)

TRTP Cumulative Projects by Jurisdiction

Aspen Environmental Group

Angeles National Forest

Montrose (Unincorporated L.A. County)
- 3 single-family lots; 96 multi-family units

La Cañada Flintridge
- 14 single-family lots
- 13,250 sq ft office/retail

Altadena (Unincorporated L.A. County)
- 8 lots; 70 multi-family units; 1 senior housing facility
- 1 commercial project
- School - 2 lots

Arcadia
- 8 multi-family units
- Mall Expansion (250,000 sq ft); 1 industrial building

Pasadena
- 63 single-family units; 605 multi-family units
- 612,451 sq ft commercial/industrial projects
- 231,000 sq ft hospital facility

East Pasadena (Unincorporated L.A. County)
- 6 single-family parcels
- 1 new motel

Temple City
- 12 single-family
- School - 2 lots

East San Gabriel (Unincorporated L.A. County)
- 10 single-family lots; 62 multi-family units

San Gabriel (Unincorporated L.A. County)
- 5 residential lots; 21 multi-family unit; 28 senior housing units

San Gabriel
- 11 multi-family units; 12 senior housing units (mixed-use housing units not included)
- 3 mixed-use commercial/industrial buildings

South San Gabriel/Rosemead (Uninc. L.A. County)
- 17 single-family units; 10 multi-family units

Rosemead
- 69 single-family units; 360 multi-family units (mixed-use units included)
- 8 mixed-use buildings (retail/office)
- 50-room hotel expansion

Monterey Park
- 527,157 sq ft (one retail center)

USACE – Santa Fe Basin
Kare Youth League Sports Park

USACE – Whittier Narrows
San Gabriel River Discovery Center

Gould
Goodrich
Rio Hondo
Mesa

La Crescenta-Montrose
La Canada Flintridge
Altadena
Sierra Madre
Monrovia
Duarte
Bradbury
Azusa
Pasadena
East Pasadena
Arcadia
San Marino
East San Gabriel
Irwindale
Mayflower Village
South Pasadena
Temple City
North El Monte
San Gabriel
Vincent
Alhambra
El Monte
Rosemead
West Covina
West Puente Valley
South El Monte
Monterey Park
South San Gabriel
Avocado Heights
Valinda
East Los Angeles
La Puente
South San Jose Hills
Vernon
Commerce
Maywood
Pico Rivera
Hacienda Heights
Bell
West Whittier-Los Nietos
Rowland Heights
Cudahy
Bell Gardens
Whittier
La Habra Heights
South Gate
Downey
Santa Fe Springs
South Whittier
Lynwood
La Habra
East La Mirada
Brea
Norwalk
La Mirada
Paramount
Bellflower
Fullerton

Substations

Proposed Routes
- Segment 4
- Segment 5
- Segment 6
- Segment 7
- Segment 8A
- Segment 8B
- Segment 8C
- Segment 10
- Segment 11
- 2-mile Buffer

1" = 2 miles

1:126,720

0 0.5 1 2 3 Miles

- Metro Gold Line Foothill Extension
- Corridor Management Plan - ANF

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TRTP Cumulative Projects by Jurisdiction

Figure 2.9-1c

Duarte
- 4 specific plans
- 73 single-family units; 10 multi-family units
- 47,509 sq ft commercial/office; 2 commercial projects

Monrovia (Unincorporated L.A. County)
- 20 multi-family units

Irwindale
- 68,357 sq ft commercial/office; 161,700 sq ft industrial
- Church - 12,227
- Continued quarry operations

Bradbury
- 2 residential estates

Ontario (New Model Colony)
- 12,207 single-family units; 4,723 multi-family units
- Approximately 115 acres commercial/industrial
- Elementary Schools - 5; Middle School - 1; High School - 2; Parks and trails

El Monte
- 283 planned units; 3 senior housing facilities (within mixed-used buildings)
- 20 projects (size not provided); 3 mixed-use buildings
- 1 transit village; 1 community center

South El Monte
- 13 single-family units
- 150,000 sq ft commercial; 9-acre shopping center

L.A. County (Near Diamond Bar)
- 3,600 residential units
- 300,000 sq ft commercial/industrial
- Open Space/Recreation - 1,670 acres

Diamond Bar
- 16 residential lots
- Open Space - 1

La Puente
- 30 single-family lots; 111 multi-family units
- 4 commercial/industrial projects
- Duck Farm Park Project

Chino (Uninc. San Bernardino County)
- 4 specific plans
- 8 single-family parcels

Pico Rivera
- 10 single-family lots; 23 multi-family units
- 12 commercial/industrial projects

Chino Hills
- 759 single-family lots; 571 multi-family units
- 1,909,905 sq ft commercial/industrial
- Church - 3; Civic Center - 200,000 sq ft

Hacienda Heights (Uninc. L.A. County)
- 18 single-family lots; 12 multi-family units
- 4 commercial/industrial projects

Brea
- 166 single-family lots; 267 multi-family units
- 1 retail building; 1 business park

Yorba Linda
- 2,644 single-family lots; 228 multi-family units
- High School - 2; Parks and Open Space - 83 acres

Aspen Environmental Group

1" = 2.5 miles

1:158,400

0 0.5 1 2 3 4 5 Miles

Substations
2-mile Buffer
Chino Hills State Park

Proposed Routes
Segment 4
Segment 5
Segment 6
Segment 7
Segment 8A
Segment 8B
Segment 8C
Segment 10
Segment 11
Chino Hills Route Alternatives 4A-4D
Partial Underground Alternative 5
Metro Gold Line Foothill Extension
Chino College Park Specific Plan
New Model Colony
Chino Hills Specific Plan

Figure 2.9-1d

TRTP Cumulative Projects by Jurisdiction

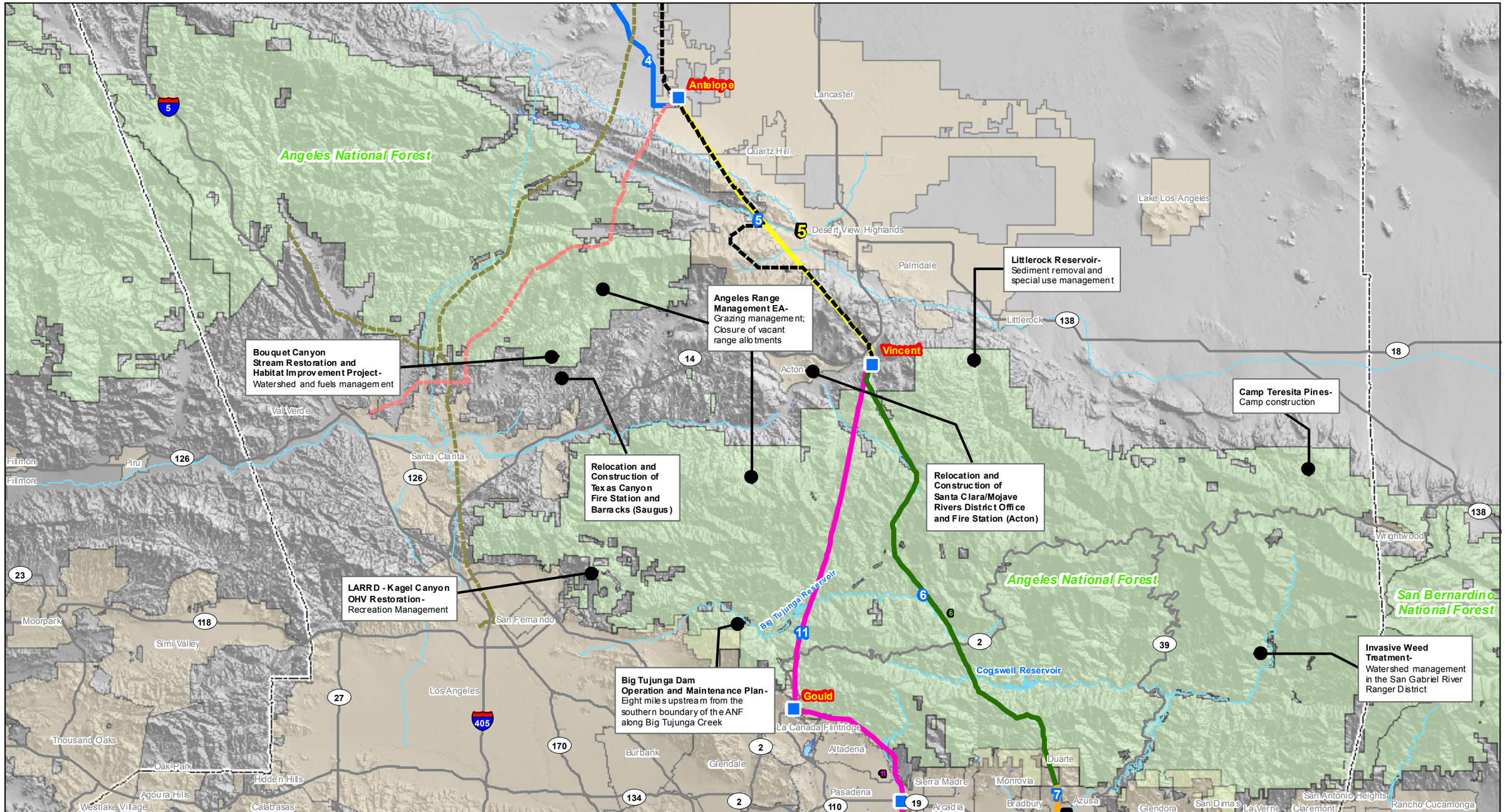

Figure 2.9-2

TRTP Cumulative Projects on NFS Lands

CUMULATIVE PROJECTS

TABLES

Table 2.9-1. Wind Generation Projects in Early Planning Stages			
Project Name	Location	Proposed MWs	Description
Pacific Wind	South of PdV site	205	250 wind turbines, new substation
Rudnick	Approx. 30 miles north of Tehachapi	N/A	N/A
Aero Energy/ Windstar	TWRA	120	Would connect to Sagebrush T/L
Aero Energy/ Windridge	Tehachapi Pass Wind Park	N/A	Development of a 1,062-acre wind farm
BLM - Wind Energy Applications			
Oak Creek Energy	Lucchese, west of Tehachapi	N/A	6,828-acre site with 12 meteorological towers
Oak Creek Energy	Mojave, Tehachapi	200+	495-acre site with 4 meteorological towers
Oak Creek Energy	Soledad Mountains	N/A	1,800-acre site with 3 meteorological towers
Oak Creek Energy	Rand Mountains	N/A	19,565-acre site with 3 meteorological towers
Boulevard Associates	Tehachapi Mountains	N/A	2,678-acre site with 4 meteorological towers
Sean Roberts	Mojave	N/A	267-acre site with 2 meteorological towers
RES/North American	Fossil Falls, Rose Valley	N/A	742-acre site with 2 meteorological towers
Oak Creek Energy	Tehachapi, Oak Creek	20	160-acres site
Power Partners Southwest, LLC	Southern Tehachapi Mountains	N/A	77-acre site with 1 meteorological tower
Renewergy, LLC	Rand Mountains	N/A	14,209-acre site with 6 meteorological towers

Source: Bureau of Land Management, Wind Energy Applications, February 2008.

Table 2.9-2. California Independent System Operator - Kern County Wind Generation Queue						
Queue Position	Application Status	Maximum MWs	Utility	Point of Interconnection (Station of T/L)	Proposed On-line Date	Current On-line Date
20	Active-Serial	300	SCE	Antelope	12/31/2006	12/31/2008
73	Active-Serial	250	SCE	Antelope Substation	12/31/2007	12/31/2008
79	Active-Serial	51	SCE	Windhub Substation 66kV bus	6/1/2006	5/31/2009
84	Active-Serial	340	SCE	Whirlwind Substation 230kV	12/31/2009	12/31/2009
86A	Active-Serial	33.1	SCE	Vincent Substation	1/1/2008	10/1/2009
86B	Active-Serial	34	SCE	Canwind Substation	1/1/2008	10/1/2009
91	Active-Serial	51	SCE	Windhub Substation 66kV bus	3/31/2010	3/31/2010
93	Active-Serial	220	SCE	Tehachapi Conceptual Substation #1	12/31/2008	12/31/2012
94	Active-Serial	180	SCE	Tehachapi Conceptual Substation #2	12/31/2008	12/31/2011
95	Active-Serial	550	SCE	Tehachapi Conceptual Substation #1	12/31/2009	12/31/2011
96	Active-Serial	600	SCE	Tehachapi Conceptual Substation #1	12/31/2009	12/31/2010
97	Active-Serial	160	SCE	Tehachapi Conceptual Substation #5	12/31/2009	12/31/2013
100	Active-Serial	120	SCE	Vincent Substation through Sagebrush 230kV line	12/31/2007	12/31/2009
119	Active-Serial	500	SCE	Windhub Substation 230kV	12/31/2010	12/31/2013
132	Active-Serial	297	SCE	230kV Conceptual Substation #2	12/31/2009	12/31/2010
153	Active-Serial	100	SCE	Whirlwind Substation 230kV	5/30/2008	12/31/2012
159	Transition Cluster	100	SCE	66kV Antelope-Neenach-Bailey line	5/30/2008	12/31/2013
175	Transition Cluster	500	SCE	Proposed Whirlwind 230kV Substation	9/30/2008	12/31/2014
188	Transition Cluster	200	SCE	Windhub Substation 230kV	12/15/2013	11/15/2012
409	Transition Cluster	205	SCE	Highwind Substation 230kV	10/01/2011	10/01/2011

Source: California Independent System Operator Controlled Grid Generation Queue, as of January 9, 2009.

Table 2.9-3. BLM Solar Energy Applications

Project Name	Location	Proposed MWs	Planned Technology	Site Description
Opti-Solar "Sapphire" Project	Near Mojave between the LA Aqueduct and Highway 14	745	Photo-voltaic	5,760 acres
Opti-Solar "Garnet" Project	Highway 395, Kramer Junction	745	Photo-voltaic	6,600 acres

Source: http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/cdd/energy.Par.44006.File.dat/Solar%20Application%20Tracking%205.13-1.pdf.

Table 2.9-4. Summary of Cumulative Projects by Jurisdiction

Jurisdiction	Residential Projects	Commercial / Industrial Projects	Other Project Types
Kern County	No Information Provided	No Information Provided	4 wind energy developments plus the Whirlwind Substation Expansion
Antelope Valley (LA County)	None Identified	None Identified	Solar energy generating facility
Lancaster	9,798 single-family lots (approx.4,500acres)	1 commercial project 9 industrial lots (3 acres total)	Park/Open Space - 2 lots School - 2 lots
Palmdale	3,715 single-family lots (includes 350 single-family units in the Ana Verde	1 commercial lot (3 acres total)	Open Space - 50 lots (12 acres) School - 1 lot Fire Station - 1 lot
Quartz Hill	21 single-family lots 75 senior housing units	None Identified	None Identified
Leona Valley	131 lots	None Identified	None Identified
Montrose (LA County)	3 single-family lots 96 multi-family units	None Identified	None Identified
La Cañada Flintridge	14 single-family lots	13,250 sq ft office/retail	None Identified
Altadena (LA County)	8 lots 70 multi-family units 1 senior housing facility	1 commercial project	School- 2 lots
Pasadena	63 single-family units 605 multi-family units	612,451 sq ft	231,000 sq ft hospital facility
East Pasadena (LA County)	6 single-family parcels	1 new motel	None Identified
East San Gabriel (LA County)	10 single-family lots 62 multi-family units	None Identified	None Identified
Arcadia	8 multi-family units	Mall Expansion (250,000 sq ft) 1 industrial building	None Identified
Temple City	12 single-family	None Identified	School - 2 lots
San Gabriel (LA County)	5 lots 21 multi-family unit 28 senior housing units	None Identified	None Identified
San Gabriel	11 multi-family units 12 senior housing units (mixed-use housing units not included)	3 mixed-use buildings	None Identified
South San Gabriel/Rosemead (LA County)	17 single-family units 10 multi-family units	None Identified	None Identified
Rosemead	69 single-family units 360 multi-family units (mixed-use units included)	8 mixed-use buildings (retail/office) 50-room hotel expansion	None Identified
Monterey Park	None Identified	527,157 sq ft (one retail center)	None Identified

Table 2.9-4. Summary of Cumulative Projects by Jurisdiction			
Jurisdiction	Residential Projects	Commercial / Industrial Projects	Other Project Types
Duarte	73 single-family units 10 multi-family units	47,509 sq ft commercial/office 2 commercial projects	None Identified
Bradbury	2 single-family estates	None Identified	None Identified
Monrovia (LA County)	20 multi-family units	None Identified	None Identified
Irwindale	None Identified	~~68,357~~87,557 sq ft commercial/office ~~161,~~745,700 sq ft industrial	Church - 12,227 Continued mining
El Monte	283 planned units 3 senior housing facilities (within mixed-used buildings)	20 projects (size not provided) 3 mixed-use buildings	1 transit village 1 community center
South El Monte	13 single-family units	150,000 sq ft commercial; 9-acre shopping center	None Identified
Pico Rivera	10 single-family lots 23 multi-family units	12 projects	None Identified
La Puente	30 single-family lots 111 multi-family units	4 projects	Duck Farm Park Project
Hacienda Heights (LA County)	18 single-family lots 12 multi-family units	4 projects	None Identified
Brea	166 single-family lots 267 multi-family units	1 retail building 1 business park	None Identified
Diamond Bar	16 lots	None Identified	Open Space - 1
LA County (near Diamond Bar)	3,600 units	300,000 sq ft	Open Space/Recreation- 1,670 acres
Yorba Linda	2,644 single-family lots 228 multi-family units	None Identified	High School - 2 Parks and Open Space - 83 acres
Chino (San Bernardino County)	8 single-family parcels	None Identified	None Identified
Chino Hills	759 single-family lots 571 multi-family units	1,909,905 sq ft	Church - 3 Civic Center - 200,000 sq ft
Ontario (New Model Colony)	12,207 single-family units 4,723 multi-family units	Approximately 115 acres	Elementary Schools - 5 Middle School - 1 High School - 2 Parks and trails

Table 2.9-5. Other Notable Projects in the Project Vicinity					
Jurisdiction	Project Name	Project Type	Project Description/Size	Project Location	Project Status
Kern County	Christine Bower	Residential	20-acres site; four single-family units	¼ mile west of 105th St. and McConnell Rd., north of the Willow Springs Specific Plan	N/A
Kern County/ LA County	Frazier Park Estate	Residential/ Commercial	847-acre site, 705 dwelling units, associated infrastructure in LA County	Southern Boundary of Kern County and a portion of LA County	N/A
LA County	Centennial Specific Plan	Residential/ Commercial	12,000-acre site; 23,000 dwelling units, 14 million sq ft commercial	One mile east of I-5, adjacent to State Hwy 138	Proposed

Table 2.9-5. Other Notable Projects in the Project Vicinity					
Jurisdiction	Project Name	Project Type	Project Description/Size	Project Location	Project Status
LA County	Tejon Mountain Village Specific Plan	Residential/ Commercial	3,450 dwelling units, 160,000 sq ft commercial	East of I-5 in the hills north and east of Castaic Lake	Proposed
City of Yorba Linda	Vista Del Verde	Master Planned Golf Community	843-acre site; 2,713 single-family dwellings, golf course, 10 acres of parks, 73 acres of open space	Yorba Linda Blvd and Imperial Highway	Approved - Construction In Progress

Table 2.9-6. Cumulative Projects on Federal Lands					
Project Name	Description/Project Purpose	Location	Planning Status	Decision	Expected Completion
USDA Forest Service – Los Angeles River District					
Big Tujunga Dam Operation & Maintenance Plan	Special use management; Watershed management; Wildlife, Fish, Rare Plants; Operation and maintenance plan for the dam and other facilities within the Big Tujunga Reservoir	Big Tujunga Creek u~~U~~pstream 8 miles from the ANF boundary ~~along Big Tujunga Creek~~	Developing Proposal Est. Scoping Start 7/2009	Expected: 8/2010	9/2010
~~LARRD – Kagel Canyon OHV Restoration~~	~~Recreation management; Install vehicle barriers and signs to restrict unauthorized use and access; Scarify soils and revegetation~~	~~Kagel Canyon~~	~~Developing Proposal Est. Scoping Start 4/2008~~	~~Expected7/2008~~	~~4/2009~~
USDA Forest Service – San Gabriel River Ranger District					
Invasive Weed Treatment EA	Watershed management; Fuels management; Vegetation management; Eradication of specified invasive weeds utilizing herbicide as the treatment method	Selected drainages~~watershed~~ in this district	Developing Proposal Est. Scoping Start 6/2009	Expected 9/2009	10/2009
Re-opening of Highway 39	Special Uses/Transportation Management - Cal Trans is seeking environmental approvals to reopen Highway 39 to connect with Highway 2. Highway 39 has been closed to the public since 1978. First phase will be construction of retaining walls, second phase will be remainder of work including re-surfacing and drainage improvement.	San Gabriel Canyon	Awaiting approval of EA and signing of Decision Notice	Phase 1 – 12/2009 Phase 2 - unknown	Fall 2011
USDA Forest Service – Santa Clara/Mojave Rivers Ranger District					
~~Angeles Range Management EA~~	~~Grazing management; Closure of vacant range allotments~~	~~Santa Clara/Mojave Rivers Ranger District and San Gabriel River Ranger Districts~~	~~Developing Proposal Est. Scoping Start 5/2008~~	~~Expected: 9/2008~~	~~10/2008~~
~~Barren Ridge-Castaic Transmission Project~~	~~Special use management; Construct, use and maintain a double-circuit 230-kV T/L, reconductor an existing 230-kV T/L, and add a new 230-kV circuit to existing transmission tower structures~~	~~San Francisquito Canyon~~	~~In progress: NOI in Federal Register 3/27/2008; Est. DEIS NOA in Federal Register 7/2009~~	~~Expected: 1/2010~~	~~6/2010~~

Table 2.9-6. Cumulative Projects on Federal Lands					
Project Name	Description/Project Purpose	Location	Planning Status	Decision	Expected Completion
~~Bouquet Canyon Stream Restoration and Habitat Improvement Project~~	~~Watershed management; Fuels management; Project would realign the Boquet Creek into its historical alignment along western slope of Boquet Canyon~~	~~Across from the Saugus Ranger Station in Boquet Canyon~~	~~Developing Proposal Est. Scoping Start 12/2008~~	~~Expected 4/2009~~	~~5/2009~~
Barren Ridge-Castaic Transmission Project	Special use management; Construct, use and maintain a double-circuit 230-kV T/L, reconductor an existing 230-kV T/L, and add a new 230-kV circuit to existing transmission tower structures	San Francisquito Canyon	In progress: NOI in Federal Register 3/27/2008; Est. DEIS NOA in Federal Register 1/2010	Expected: 1/2010	6/2010
Antelope-Pardee 500-kV Transmission Project EIS	Special use management; Authorization of a 50-year easement to SCE for the construction, use and maintenance of a 500-kV line along approx. 13 miles	Bouquet Canyon/Del Sur Ridge~~Santa Clara/Mojave Rivers~~	Completed	Actual: 8/21/2007	10/2009~~9/2007~~
USDA Forest Service – Angeles National Forest, Forest-wide					
SCE Distribution Line Maintenance	Special Uses Operations/Maintenance - Ongoing program to inventory and replace wood poles on SCE electrical distribution lines. Usually involves no new road construction or major disturbance.	Varies, across entire forest	Ongoing	Varies	Ongoing program
Recreation Facilities	Recreation Facility Management - Several existing developed recreation sites will undergo facility repair, upgrade, or modification. Sites include Switzer Picnic Area, Charlton/Chilao Rec. Area, Colby Trailhead, and Aliso Springs Picnic Area.	Along or near to Forest Highway or Angeles Crest	Varies – under construction, awaiting funding, or undergoing environmental approvals.	Varies	Within next 2-3 years
Fuels Management Projects	Vegetation Management – Various projects to improve forest stand health and construct and maintain fuelbreaks. Tree cutting, hand and mechanical brush removal, chipping, and pile burning are primary activities.	West of Shortcut Fire Station, Barley Flats, Little Gleason, Millcreek and Fatcat Plantations	Varies – ongoing or completing environmental reviews	Varies	Ongoing program
~~Littlerock Recreation Area EA~~	~~Road management; Heritage resource management; Recreation management; Proposed reopening of Littlerock Creek Rd, Alimony TT and OHV Trail; Bridge construction over creeks; Fencing of critical toad habitat~~	~~Littlerock Recreation Area~~	~~In Progress: 3/18/2005~~	~~Expected 9/2009~~	~~12/2009~~
~~Littlerock Reservoir Sediment Removal Project EIS~~	~~Special use management; Remove excess reservoir sediment; Restore water storage and flood control capacity; Prevent sediment loss~~	~~Littlerock Reservoir~~	~~In Progress: DEIS in Federal Register 7/5/2005 Est. FEIS NOA in Federal Register 11/2008~~	~~Expected: 3/2009~~	~~6/2009~~

Table 2.9-6. Cumulative Projects on Federal Lands

Project Name	Description/Project Purpose	Location	Planning Status	Decision	Expected Completion
~~Relocation and Construction of Texas Canyon Fire Station and Barracks in Saugus~~	~~Facility management; Relocate the Texas Canyon Fire Station and Barracks approximately a mile west of its current location~~	~~Saugus, CA~~	~~Developing Proposal Est. Scoping Start 3/2008~~	~~Expected: 5/2008~~	~~10/2008~~
~~Relocation and Construction of Santa Clara/Mojave Rivers District Office and Fire Station, Acton~~	~~Facility management; Construct a new District Office and Fire Station for the Santa Clara/Mojave Rivers Ranger District on 5 acres in Acton~~	~~Acton, CA~~	~~Developing Proposal Est. Scoping Start 3/2008~~	~~Expected: 5/2008~~	~~10/2008~~
~~Teresita Pines Organization Camp Construction~~	~~Special use management; Modify existing building; Construct new facilities and a parking area~~	~~Teresita Pines Organization Camp~~	~~In Progress: Legal Notice 8/15/2003~~	~~Expected: 1/2009~~	~~2/2009~~
U.S. Army Corp of Engineers					
Kare Youth League Sports Park	Recreational athletic park	Santa Fe Basin			
San Gabriel River Discovery Center	Discovery Center building, outdoor classrooms and parking	Whittier Narrows	EIR to be complete mid-2009	N/A	2011

Source: Angeles National Forest, Schedule of Proposed Action 01/01/2009 to 03/31/2009; for USACE projects, refer to Chapter 8 (References)~~.~~; and cumulative project information provided by the Forest Service in response to the Administrative Final EIR/EIS in July 2009.

Table 2.9-7. Plans and Environmental Documents Consulted in Cumulative Impact Analysis

FEDERAL PLANS
BLM - The California Desert Conservation Area Plan
BLM - West Mojave Plan
USDA Forest Service - US Forest Service Manual (Section 2700)
USDA Forest Service - USFS Manual Region 5 Supplement No. 2700-92-8
USDA Forest Service - Pacific Crest Trail Management
USDA Forest Service - National Fire Plan
USDA Forest Service - Angeles National Forest Land Management Plan
USACE Whittier Narrows Recreation Master Plan
USACE Santa Fe Basin Master Plan
STATE PLANS
California Department of Forestry and Fire Protection
California State Parks
California High-Speed Rail Implementation Plan
COUNTY AND REGIONAL PLANS
Southern California Association of Governments
Southern California Association of Governments - Regional Transportation Plan (Includes the Maglev System and Regional Aviation Plan)
Los Angeles County Department of Parks and Recreation - Strategic Plan
Kern County - General Plan
Antelope Valley-East Kern Water Agency - Urban Water Management Plan
Los Angeles County - General Plan
Los Angeles County Metro Gold Line Foothill Extension - Pasadena to Montclair
San Bernardino County - General Plan
Corridor Management Plan- Angeles Crest Scenic Byway, CA State Route 2 Enhancement
Los Angeles County Public Works - San Gabriel River Corridor Master Plan and PEIR

Table 2.9-7. Plans and Environmental Documents Consulted in Cumulative Impact Analysis
San Gabriel Valley Council of Governments - General Plan
City of Whittier or the Sanitation Districts of Los Angeles County - Puente Hills Landfill Native Habitat Preservation Authority Resource Management Plan
LOCAL PLANS
City of Lancaster - General Plan 2020
City of Palmdale - General Plan
City of Duarte - General Plan
City of Monrovia - General Plan
City of Azusa - General Plan
City of Irwindale - General Plan
City of Baldwin Park - General Plan 2020
City of El Monte - General Plan
City of Industry - General Plan
City of South El Monte - General Plan
City of Montebello - General Plan
City of Monterey Park - General Plan
City of Pico Rivera - General Plan
City of Whittier - General Plan
City of La Habra Heights - General Plan
City of La Canada Flintridge - General Plan
City of Pasadena - General Plan
City of San Gabriel - General Plan
City of Temple City - General Plan
City of Rosemead - General Plan
City of Chino Hills - General Plan
City of Ontario - General Plan
SPECIFIC PLANS & MASTER PLANS
Kern County Department of Planning and Development Services - Willow Springs Specific Plan
City of Palmdale - Ritter Ranch Master Planned Community
City of Palmdale - City Ranch Specific Plan (also known as Ana Verde)
~~City of Palmdale – Quail Valley Annexation and Development Plan~~
City of Bradbury – General Plan
City of Duarte - Rancho Verde Specific Plan
City of Duarte - Encanto Parkway Specific Plan
City of Duarte - Las Brisas Specific Plan
City of Duarte - Andes Duarte Terrace Specific Plan
City of El Monte - El Monte Urban Transit Village Specific Plan
City of Sierra Madre - Sierra Madre Downtown Specific Plan
City of Temple City - Downtown Specific Plan
City of San Gabriel - Mission District Specific Plan
City of Alhambra - Vincent Lugo Master Plan
City of Pasadena - East Pasadena Specific Plan
City of Pasadena - East Colorado Boulevard Specific Plan
City of Whittier - Uptown Whittier Specific Plan
Duck Farm Park Project Initial Study and Mitigated Negative Declaration - Watershed Conservation Authority

Table 2.9-7. Plans and Environmental Documents Consulted in Cumulative Impact Analysis
City of Chino Hills - Chino Hills Specific Plan
City of Chino Hills - Multi-Use Trails Master Plan
City of Chino - Eucalyptus Business Park Specific Plan
City of Chino - East Chino Specific Plan
City of Chino - Chino College Park Specific Plan
City of Chino - Central Avenue Specific Plan
Aera Master Plan Community - Unincorporated LA County, near the City of Diamond Bar
City of Ontario - New Model Colony Specific Plan

Table 2.9-8. Kern County Population Projections	
2000 Population	664,694
2010 Population	808,808
2020 Population	950,112
2030 Population	1,114,878
2040 Population	1,325,648
2050 Population	1,549,594
Change	884,900
Percent Change from 2000 to 2050	133%

Source: Population Forecast- KernCOG/California Dept. of Finance, May 2004

Table 2.9-9. Kern County Employment Projections	
2004 Employment	270,800
2014 Employment	312,200
Change	41,400
% Change 2004 to 2014	15%

Source: California Employment Development Department, Labor Market Info, 2007

Table 2.9-10. ~~Los Angeles County~~ Population Projections <u>for Incorporated Cities Along the Proposed Route</u>

City	2000	2005	2010	2015	2020	2025	2030	Change from 2000 to 2030	% Change from 2000 to 2030
Lancaster	119,416	142,043	168,032	191,912	215,468	238,048	259,696	140,280	117.5%
Palmdale	117,729	145,995	176,506	218,387	259,712	299,324	337,314	219,585	186.5%
Alhambra	86,162	91,173	94,802	96,963	99,091	101,134	103,093	16,931	19.7%
Azusa	44,889	48,783	51,412	53,231	55,025	56,741	58,388	13,499	30.0%
Baldwin Park	76,304	82,160	86,367	87,633	88,880	90,071	91,219	14,915	19.5%
Diamond Bar	56,543	59,667	60,812	62,632	64,427	66,146	67,798	11,255	19.9%
Duarte	21,576	22,656	23,110	23,490	23,866	24,227	24,570	2,994	13.8%
El Monte	116,471	125,790	132,082	137,498	142,843	147,966	152,880	36,409	31.3%
Irwindale	1,452	1,612	1,809	2,086	2,358	2,620	2,871	1,419	97.7%
Industry	779	796	799	799	799	799	799	20	2.5%
Monrovia	37,091	38,674	39,037	39,586	40,126	40,648	41,145	4,054	10.9%
Montebello	62,404	65,202	66,020	67,067	68,102	69,094	70,046	7,642	12.2%
Monterey Park	60,517	65,945	70,072	75,531	80,917	86,077	91,027	30,510	50.4%
Pasadena	134,477	143,837	146,489	152,908	159,242	165,317	171,138	36,661	27.3%

Table 2.9-10. ~~Los Angeles County~~ Population Projections for Incorporated Cities Along the Proposed Route

City	2000	2005	2010	2015	2020	2025	2030	Change from 2000 to 2030	% Change from 2000 to 2030
Rosemead	53,866	56,706	57,750	59,288	60,806	62,256	63,651	9,785	18.2%
San Gabriel	39,986	43,006	45,346	47,753	50,127	52,403	54,585	14,599	36.5%
South El Monte	21,232	22,187	22,559	23,000	23,438	23,855	24,256	3,024	14.2%
Temple City	33,515	35,046	35,610	36,284	36,948	37,585	38,195	4,680	14.0%
Pico Rivera	63,686	66,534	67,523	69,389	71,231	72,993	74,687	11,001	17.3%
La Habra Heights	5,744	6,284	6,631	7,296	7,950	8,579	9,181	3,437	59.8%
Whittier	83,997	87,073	88,085	89,577	91,049	92,462	93,814	9,817	11.7%
La Canada Flintridge	20,417	21,262	21,340	21,399	21,456	21,510	21,562	1,145	5.6%
Chino	67,299	75,097	82,319	90,563	98,703	106,500	113,977	46,678	69.3%
Chino Hills	67,312	75,017	78,307	80,126	81,916	83,636	85,284	17,972	26.7%
Ontario	158,331	171,154	180,059	212,734	244,977	275,873	305,509	147,178	92.9%
Bradbury	859	932	949	999	1,049	1,097	1,143	284	33.1%
San Marino	12,991	13,455	13,486	13,497	13,505	13,515	13,523	532	4.1%
La Puente	41,240	43,159	44,001	47,755	51,464	55,017	58,426	17,186	41.7%

Source: SCAG, 2004 Regional Transportation Plan: Growth Forecast Report

Table 2.9-11. ~~Los Angeles County~~ Employment Projections by Number of Jobs for Incorporated Cities Along the Proposed Route

City	2000	2005	2010	2015	2020	2025	2030	Change from 2000 to 2030	% Change from 2000 to 2030
Lancaster	52,119	52,791	59,684	62,937	66,081	69,026	71,816	19,697	37.8%
Palmdale	45,116	45,876	53,695	61,591	69,133	76,059	82,470	37,354	82.8%
Alhambra	36,118	36,743	43,159	44,975	46,690	48,230	49,621	13,503	37.4%
Azusa	14,753	14,939	16,840	17,436	18,000	18,504	18,961	4,208	28.5%
Baldwin Park	18,319	18,667	22,257	23,214	24,116	24,925	25,656	7,337	40.0%
Diamond Bar	16,128	16,402	19,217	20,071	20,874	21,595	22,248	6,120	19.3%
Duarte	10,033	10,131	11,150	11,409	11,653	11,873	12,071	2,038	20.3%
El Monte	42,873	43,345	48,195	49,594	50,916	52,105	53,181	10,308	24.0%
Irwindale	25,257	26,666	41,119	43,892	46,511	48,855	50,971	25,714	101.1%
Industry	80,213	80,407	82,397	82,505	82,609	82,707	82,801	2,588	3.2%
Monrovia	22,435	22,587	24,134	24,697	25,227	25,705	26,142	3,707	16.5%
Montebello	24,807	25,060	27,642	28,425	29,164	29,830	30,428	5,621	22.6%
Monterey Park	22,590	22,848	25,491	26,368	27,195	27,939	28,609	6,019	26.6%
Pasadena	94,570	95,772	108,096	111,392	114,518	117,321	119,860	25,290	26.7%
Rosemead	20,700	20,878	22,689	23,269	23,816	24,310	24,757	4,057	19.6%
San Gabriel	14,747	14,856	15,963	16,275	16,568	16,833	17,071	2,324	15.8%
South El Monte	19,186	19,287	20,320	20,605	20,875	21,120	21,342	2,156	11.2%
Temple City	7,204	7,252	7,731	7,868	7,999	8,115	8,219	1,015	14.1%
Pico Rivera	22,809	23,082	25,867	26,631	27,349	27,994	28,574	5,765	25.3%
La Habra Heights	425	425	429	434	440	446	451	26	6.1%
Whittier	31,911	32,298	36,237	37,300	38,303	39,200	40,011	8,100	25.3%
La Canada Flintridge	12,364	12,499	13,877	14,193	14,494	14,767	15,016	2,652	21.4%
Chino	34,055	37,393	41,983	44,714	47,507	50,321	53,174	19,119	56.1%
Chino Hills	4,871	5,297	5,883	6,304	6,734	7,167	7,605	2,734	56.1%
Ontario	76,927	85,536	97,366	109,637	122,204	134,897	147,785	70,858	92.1%
Bradbury	229	248	440	481	518	551	580	351	153.0%
San Marino	4,498	4,535	4,914	5,013	5,106	5,189	5,265	767	17.0%
La Puente	7,716	7,725	7,812	7,893	7,968	8,037	8,100	384	4.9%

Source: SCAG, 2004 Regional Transportation Plan: Growth Forecast Report

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
KERN COUNTY – No Information Provided by the County					
CITY OF LANCASTER					
5	Standard Pacific Corporation	Residential	Approximately 645 acres; 1,925 single-family lots	Between 92nd and 105th Street West and Avenues G and H, Lancaster	Grading
5	Rafael and Aida Torres	Residential	3 parcels; approximately 10.08 acres	106th St. West and Avenue K, Lancaster	N/A
5	Western Consolidated Investors	Residential	60 single-family lots and 1 public lot	Avenue N between 40th and 42nd St. West, Lancaster	68% Complete
5	Suburban Development Company	Residential	94 single-family lots	Avenue L and 55th St. West, Lancaster	0% Complete
5	All California Funding	Residential	18 single-family lots	Avenue L and 55th St. West, Lancaster	0% Complete
5	Los Hermanos-Gary Fischer and Thomas M. Wilson	Residential	Approximately 71 acres; 67 single-family lots (Phase I- 38 lots, Phase II- 29 lots)	Avenue M between 32nd and 40th St. West, Lancaster	Phase I- 68% Complete, Phase II- 31% Complete
5	Turnkey Developers, Inc.	Residential	Approximately 8 acres; 23 single-family lots	Avenue L-12 and 70th St. West, Lancaster	98% Complete
5	Heller Development	Residential	Approximately 180 acres; 631 single-family lots and 1 acre for drainage basin	Avenue H between 80th and 90th St. West, Lancaster	N/A
5	Larwin Company	Residential	Approximately 880 acres; 2,469 single-family lots; 1 park, 1 commercial lot and 2 lots for schools	Bounded by 90th and 105th St. West, Avenue G to Avenue H-8, Lancaster	N/A
5	Forecast Homes	Residential	Approximately 40 acres; 137 single-family lots and 3 open space lots	90th St. West and Avenue I, Lancaster	0% Complete
5	Trimark Pacific Homes	Residential	Approximately 20 acres; 88 single-family lots and a detention basin	Avenue K near 50th St. West, Lancaster	92% Complete
5	Forecast Homes	Residential	Approximately 80 acres; 289 single-family lots and 3 open space lots	90th St. West and Avenue I, Lancaster	N/A
5	KB Home	Residential	Approximately 18 acres; 73 single-family lots	Avenue J and 60th St. West, Lancaster	Complete
5	Lancaster 563, LLC	Residential	Approximately 483 acres; 73 single-family lots	70th St. West and Avenue K , Lancaster	N/A
5	Pacific Communities	Residential	Approximately 20.17 acres; 62 single-family lots	Near 75th St. West and Avenue L-8, Lancaster	98% Complete
5	Pacific Communities	Residential	Approximately 40 acres; 156 single-family lots	Near Avenue K-8 and 60th St. West, Lancaster	N/A
5	Standard Pacific Corporation	Residential	Approximately 40 acres; 156 single-family lots	Avenue J-8 and 65th St. West, Lancaster	Complete
5	Standard Pacific Corporation	Residential	Approximately 15 acres; 63 single-family lots	Avenue K and future 62nd St. West, Lancaster	Complete
5	Stratham Properties	Residential	Approximately 10 acres; 31 single-family lots	Avenue L and 70th St. West, Lancaster	0% Complete
5	Hearthside Homes	Residential	Approximately 70 acres; 77 single-family lots	Avenue L-8 and 70th St. West, Lancaster	9% Complete
5	Richmond American Homes	Residential	Approximately 70 acres; 50 single-family lots	Avenue L-8 and 70th St. West, Lancaster	0% Complete

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
5	Capital Pacific Homes	Residential	Approximately 70 acres; 80 single-family lots	Avenue L-8 and 70th St. West, Lancaster	26% Complete
5	Forecast Homes	Residential	Approximately 63 acres; 254 single-family lots	Avenue K and 60th St. West, Lancaster	99% Complete
5	Beazer Homes	Residential	Approximately 10 acres; 36 single-family lots	Avenue J-8 and 60th St. West, Lancaster	94% Complete
5	Matthews Homes	Residential	Approximately 27 acres; 106 single-family homes	Avenue J and 60th St. West, Lancaster	0% Complete
5	Pacific Communities Builder	Residential	Approximately 120 acres; 305 single-family lots	Avenue L-8 and 80th St. West, Lancaster	N/A
5	Matthews Homes	Residential	Approximately 30 acres; 99 single-family homes	65th St. West and Avenue J, Lancaster	N/A
5	Pacific Communities	Residential	74.48 acres; 162 single-family homes	40th St. West and Avenue N, Lancaster	N/A
5	Warmington House	Residential	80.5 acres; 50 single-family homes	60th St. West and Avenue K	39% Complete
5	Capital Pacific Homes	Residential	80.5 acres; 87 single-family homes	60th St. West and Avenue K	89% Complete
5	Richmond American Homes	Residential	80.5 acres; 81 single-family homes	60th St. West and Avenue K	Complete
5	Pinnacle Communities	Residential	80.5 acres; 78 single-family homes	60th St. West and Avenue K	73% Complete
5	Beazer Homes	Residential	18.2 acres; 77 single-family lots	Avenue K and 62nd St. West, Lancaster	44% Complete
5	Richmond American Homes	Residential	Approximately 10 acres; 43 single-family lots	60th St. West and future Avenue K-8	35% Complete
5	Richmond American Homes	Residential	Approximately 10 acres; 41 single-family lots	60th St. West and future Avenue K-12, Lancaster	0% Complete
5	Larwin Company	Residential	Approximately 40 acres; 156 single-family lots	Future 85th St. West and future Avenue G-8, Lancaster	N/A
5	Larwin Company	Residential	17.7 acres; 63 single-family lots	Future 85th St. West and future Avenue G-8, Lancaster	N/A
5	Royal Investors Group	Residential	12.51 acres; 49 single-family lots	60th St. West and Avenue J-8, Lancaster	N/A
5	Richmond American Homes	Residential	Approximately 25 acres; 85 single-family lots	Avenue L and 60th St. West, Lancaster	80% Complete
5	Mark Seminaro	Residential	Approximately 10 acres; 41 single-family lots	60th St. West and future Avenue K-12, Lancaster	N/A
5	Royal Investors Group	Residential	15.1 acres; 40 single-family lots	55th St. West and Avenue L, Lancaster	N/A
5	KB Home	Residential	Approximately 20 acres; 86 single-family lots	60th St. West and Avenue K-4, Lancaster	10% Complete
5	Matthews Homes	Residential	9.98 acres; 33 single-family lots	Avenue J and 62nd St. West, Lancaster	N/A
5	Pulte Homes	Residential	Approximately 40 acres; 67 single-family lots	Avenue M-8 and 35th St. West, Lancaster	99% Complete
5	Pinnacle Communities	Residential	4.72 acres; 15 single-family lots	45th St. West and Avenue M-12, Lancaster	0% Complete
5	Ellevan, Inc	Residential	Approximately 5 acres; 22 single-family lots	56th St. West and Avenue J-12, Lancaster	N/A
5	Ben Kwon	Residential	18.25 acres; 27 single-family lots and 1 open space RPD	40th St. West and Avenue M, Lancaster	N/A
5	Taft Corporation	Residential	7.5 acres; 33 single-family lots	60th St. West and Avenue K-12, Lancaster	N/A

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
5	Royal Investors Group	Residential	Approximately 15 acres; 58 single-family lots	57th St. West and Avenue K, Lancaster	N/A
5	Royal Investors Group	Residential	15.14 acres; 58 single-family lots	Avenue K and future 57th St. West, Lancaster	N/A
5	Royal Investors Group	Residential	20.15 acres; 60 single-family lots	55th St. West and Avenue K, Lancaster	N/A
5	KB Home	Residential	20.25 acres; 77 single-family lots	60th St. West and Avenue K, Lancaster	0% Complete
5	Royal Investors Group	Residential	Approximately 5 acres; 19 single-family lots	Avenue J-12 and 60th St. West, Lancaster	N/A
5	Lennar Homes	Residential	20.25 acres; 56 single-family lots	67th St. West and Avenue L, Lancaster	N/A
5	United Engineering Group	Residential	5.58 acres; 21 single-family lots	60th St. West and Avenue J-12, Lancaster	N/A
5	PHB and Associates, Inc.	Residential	64.22 acres; 205 single-family lots	80th St. West and Avenue L, Lancaster	N/A
5	Pacific Land Company	Residential	Approximately 10 acres; 36 single-family lots	65th St. West and Avenue K, Lancaster	N/A
5	Pacific Communities	Residential	Approximately 10 acres; 15 single-family lots	35th St. West and Avenue M-8, Lancaster	N/A
5	The Gilley Group, LLC	Residential	17.5 acres; 30 single-family lots	40th St. West and Avenue M-4, Lancaster	N/A
5	Ariel Properties	Residential	64.3 acres; 183 single-family lots	Future 85th St. West and future Avenue M-4, Lancaster	N/A
5	Bola Akinpelu	Residential	7.23 acres; 11 single-family lots	42nd St. West and Avenue N, Lancaster	N/A
5	P&S Development	Residential	Approximately 20 acres; 84 single-family lots	60th St. West and Avenue K-12, Lancaster	N/A
5	Ariel Properties	Residential	56.4 acres; 111 single-family lots	Future 85th St. West and future Avenue L-8, Lancaster	N/A
5	WSI Avanta Land, LLC	Residential	Approximately 468 acres; create 13 lots ranging in size from 16 to 64 acres	Avenue K and 80th St. West, Lancaster	N/A
5	Mojave Merchant Ltd	Industrial	3.07 acres; 9 industrial lots- PUD creating 8 building units and 1 common parking lot	Avenue K-6 and Gingham Place, Lancaster	N/A
5	Rancho Del Sur	Residential	1,975 single-family homes		Active; Anticipated in 2008
CITY OF PALMDALE					
5	TTM 060431	Residential	Subdivide approximately 75 acres into 176 single-family lots	North side of Avenue M-8 between 70th and 75th Streets West	Approved 8/11/04 Expires 8/11/07
5	TTM 60209	Residential	Subdivide 20.5 acres into 41 single-family lots	Southwest corner of Avenue M and 70th Street West	Recorded Map
5	TTM 54339	Residential	83 lots	Southeast corner of Avenue M and 70th Street West	Recorded Map
5	TTM 54301	Residential	180 lots	Northwest corner of Avenue M-8 and 65th Street West	Recorded Map
5	TTM 061794	Residential	Subdivide 10 acres into 16 single-family lots	South of Avenue M-8, 660 feet west of 70th Street West	Submitted 11/2004, remains incomplete, no hearing date

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
5	TTM 061874	Residential	Subdivide 15 acres into 23 lots	Southwest corner of Avenue N and 60th Street West	Submitted 4/2004, remains incomplete, no hearing date
5	VTT 52200 TE (Joshua Ranch)	Residential	539 Single-Family Lots, 1 Commercial Lot, and Open Space Lots	North of Elizabeth Lake Road, 1,000 feet west of 30th Street West	Phases 1-3 recorded Phases 4 & % unrecorded
5	TTM 063145	Residential	Subdivide 50.56 acres into 240 lots and 2 parks	Parkview Drive and Westland Drive	Approved 6/7/2006 Expires 7/10/12
5	VTTM 51508-03 (Ritter Ranch)	Residential	Subdivide 92.322 acres into 4 lots	South of Elizabeth Lake Road and east of Ranch Center Drive within the Ritter Ranch Specific Plan	Approved 6/7/2006 Expires 7/10/12
5	VTT 51604 (Ritter Ranch)	Residential	126 lots	Northeast corner of Westland Drive and Parkview Drive – Planning Unit 5W – Ritter Ranch	Recorded Map
5	VTT 51605 (Ritter Ranch)	Residential	125 lots	Approximately 2,700 feet south of Elizabeth Lake Road west of 40th Street West – Planning Unit 5V – Ritter Ranch	Recorded Map
5	VTT 51606 (Ritter Ranch)	Residential	59 lots	Approximately 2,700 feet south of Elizabeth Lake Road west of 40th Street West – Planning Unit 5D – Ritter Ranch	Recorded Map
5	VTT 51607 (Ritter Ranch)	Residential	82 lots	Approximately 2,700 feet south of Elizabeth Lake Road west of 50th Street West – Planning Unit 5D – Ritter Ranch	Recorded Map
5	VTT 52093 (Ritter Ranch)	Residential	106 lots	Southeast corner of Westland Drive and Parkview Drive – Planning Unit 5W – Ritter Ranch	Recorded Map
5	VTT 52116 (Ritter Ranch)	Residential	53 lots	Southwest of Westland Drive and Parkview Drive – Ritter Ranch	Recorded Map
5	TTM 061894 (City Ranch/Ana Verde)	Master Planned Community	Subdivide 471.85 acres into 350 single-family lots, 3 detention basin lots, 1 school site, 1 fire station, 33 open space lots, and 13 natural open spaces	South side of Avenue S, west of Parkwood Drive within the City Ranch Specific Plan (Ana Verde)	Approved 3/25/05 Expires 5/10/13
5	TPM 061895	Residential	Subdivide 471.85 acres into 9 parcels	South side of Avenue S west of Ranch Center Drive	Approved 2/3/05 Expires 5/10/13
5	TT 54116 (City Ranch/Ana Verde)	Residential	53 lots	Parkwood Drive and Magnolia within the City Ranch Specific Plan	Recorded Map
5	TT 54116-02 (City Ranch/Ana Verde)	Residential	117 lots	Parkwood Drive within the City Ranch Specific Plan	Recorded Map

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
5	TT 54117-03 (City Ranch/Ana Verde)	Residential	81 lots	Parkwood Drive and Greenbrier Street within the City Ranch Specific Plan	Recorded Map
5	TT 54117-04 (City Ranch/Ana Verde)	Residential	126 lots	Parkwood Drive and Greenbrier Street within the City Ranch Specific Plan	Recorded Map
5	SPR 9-03-1 Norm Titcher Park	Park	12 acres	The Groves, east of Parkwood Drive	Under construction
5	CUP 05-26	Fire Station	Develop a 9,000 sq.ft. fire station on 1.5 acres	Avenue S and Estancia Street	Approved 11/16/06 Expires 11/28/09
5	TT 54328	Residential	Subdivide 166 acres into 393 Single Family Residential Lots	North side of Avenue S, between east boundary of City Ranch Specific Plan and California Aqueduct	Submitted 6/2004, remains incomplete, no hearing date
5	General Plan Amendment 06-04, Planned Development 06-02 and Tentative Tract Map 65813	Residential	Develop approximately 1,004 acres into a comprehensive planned residential development with 712 single-family homes	Approximately 1.2 miles west of SR-14 and south of Avenue S	Under Review
5		Residential	21-lot subdivision with single-family dwellings on one-acre lots	Avenue S and Felicitas Ave., Palmdale	Tentative Map and CUP In Progress
QUARTZ HILL (Los Angeles County)					
5	TR062832	Residential	19 single-family lots	5657 Avenue M8, Quartz Hill	N/A
5	R2005-02265	Residential	75 senior housing units, convalescent home and retirement community	6705 Avenue M, Quartz Hill	N/A
5	PM66554	Residential	Two-lot subdivision	4631 Avenue M8, Quartz Hill	N/A
LEONA VALLEY (Los Angeles County)					
5	PM62789	Residential	Create three single-family lots	9539 Leona Ave., Leona Valley	Tentative Map In Progress
5	PM066871	Residential	Three-lot subdivision	9828 Elizabeth Lake Rd., Leona Valley	Tentative Map In Progress
5	PM068295	Residential	Four single-family lots	6989 Elizabeth Lake Rd., Leona Valley	Tentative Map In Progress
5	TR066952	Residential	121 single-family lots and two private street lots on 292.49 acres	80th St. West and Bouquet Canyon, Leona Valley	Tentative Map and CUP In Progress
MONTROSE (Los Angeles County)					
11	PM061826	Residential	Three-unit condo on one lot	4428 Ocean View Blvd, Montrose	Tentative Map In Progress
11	R2006-01361	Residential	Eight-unit apartment building	2222 & 2226 Montrose Ave., Montrose	CUP Approved
11	PM065814	Residential	Four condo units	2621 Prospect Ave., Montrose	N/A
11	R2006-01849	Mixed-Use	2,888 sq ft of office space and five one-bedroom apartment units	2767 & 2773 Foothill Blvd, Montrose	N/A
11	R2006-02054	Residential	Four-unit apartment building	2429 Montrose Ave., Montrose	N/A
11	TR065885	Residential	Six-unit condominium building	2505 Montrose Ave., Montrose	N/A

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
11	PM067564	Residential	Three single-family lots on 0.50 gross acres	2752 Prospect Ave., Montrose	Tentative Map Approved
11	TR066999	Residential	One multi-family lot with 16 new condos on 0.76 gross acres	2340 Montrose Ave., Montrose	N/A
11	TR066188	Residential	One multi-family lot with 12 new condos	2528 & 2532 Montrose Ave., Montrose	N/A
11	R2006-03317	Residential	Five-unit apartment building	2128 Glenada Ave., Montrose	N/A
11	TR068107	Residential	One multi-family lot with 26 new condos in seven buildings on 1.52 acres	3900 & 3908 Park Pl., Montrose	N/A
11	TR068404	Residential	Seven new condo units	4400 & 4404 Ocean View Blvd, Montrose	N/A
CITY OF LA CAÑADA FLINTRIDGE					
11	Dave De Angelis	Residential	New 4,612 sq ft two-story residence	1032 Wiladonia Dr., La Cañada Flintridge	N/A
11	Darling/ Stoddard	Residential	New 3,690 sq ft two-story residence	5236 Stardust Rd., La Cañada Flintridge	N/A
11	Zaimes/ Hutchins	Residential	New 4,300 sq ft residence	1046 Lavender Ln., La Cañada Flintridge	N/A
11	Bolton	Residential	New 5,490 sq ft residence	5271 Vista Miguel Dr., La Cañada Flintridge	N/A
11	Copeland/ Boghossian & Associates	Residential	4.04 acres subdivided into two lots	285 Berkshire Ave., La Cañada Flintridge	N/A
11	Ott & Associates	Residential	New 5,942 sq ft residence	4596 Leir Dr., La Cañada Flintridge	N/A
11	Avedian	Single-Family Residential	3,200 sq ft two-story residence	1936 Hilldale Dr., La Cañada Flintridge	N/A
11	Lim/Larkin Design	Single-Family Residential	4,743 sq ft residence	4365 Chevy Chase Dr., La Cañada Flintridge	N/A
11	Lee	Residential	Two-lot parcel map	4335 Vista Pl., La Cañada Flintridge	N/A
11	Shaheen	Residential	New 5,100 sq ft residence	2255 San Gorgonio Dr., La Cañada Flintridge	N/A
11	Zentmyer	Office/Retail	Construct 4,050 sq ft office/retail building	1434 Foothill Blvd, La Cañada Flintridge	N/A
11	Sandoval/Aceytuno	Residential	New two-story residenc; 1,811 sq ft first floor, 1,105 sq ft second story	4843 Burgoyne Ln., La Cañada Flintridge	N/A
11	Lee	Residential	New 3,907 two-story residence	327 Santa Inez Way, La Cañada Flintridge	N/A
11	Brad Howard	Retail	9,200 sq ft retail center	1975 Verdugo Blvd, La Cañada Flintridge	N/A
ALTADENA (Los Angeles County)					
11	85257	Residential	Three single-family lots on 3.2 acres	1167 Loma Alta Dr., Altadena	Tentative Map Approved
11	R2004-00402	Residential and Commercial	Eleven-lot fitness center and residential	Lincoln Ave. and Acacia St., Altadena	CUP Approved
11	PM062747	Residential	Create two single-family parcels on 0.42 acres	707 Harriet St., Altadena	Tentative Map Approved
11	87044	Residential	Four condominium units on a commercial lot	2233 Giddings Ranch, Altadena	Tentative Map and CUP Approved
11	PM062857	Residential	Four condominium units	85 Las Flores Dr., Altadena	Tentative Map Application In Progress

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
11	R2005-02234	School	Pre-school, day care and kindergarten (45 kids)	2320 Lake Ave., Altadena	CUP Approved
11	TR0650062	Residential	Construct two multi-family lots with 49 condominium units on 4.55 acres	2399 Fair Oaks Ave., Altadena	Tentative Map Approved
11	PM064462	Residential	Three-lot subdivision	3572 Canyon Ridge, Altadena	Tentative Map Application In Progress
11	PM066769	Residential	Three units on one lot	1796 Sierra Bonita Ave., Altadena	Tentative Map Application In Progress
11	R2006-02805	Residential	Adult residential facility in a commercial zone	20 Mariposa St., Altadena	CUP Application In Progress
11	R2007-02030	Residential	Construct a new independent and assisted living community for seniors consisting of 278 units (623,871 sq ft)	Crawford Ave. and Alameda St., Altadena	CUP and Housing Permit In Progress
11	R2007-02446	School	Proposed day care center	2737 Tola Ave., Altadena	Community Care License In Progress
CITY OF PASADENA					
11	Grand Oaks Lofts	Mixed-Use	Four story, 44 unit work/live development; two levels of underground parking	2191 E. Colorado Blvd, Pasadena	Design Review approved 3/12/07
11	Las Encinas Hospital	Hospital Facility	Add 231,000 sq ft new development	2900 E. Del Mar Blvd, Pasadena	EIR In Progress
11	Stor-Box Self Storage	Commercial	106,910 sq ft expansion of self-storage facility	2233 E. Foothill Blvd, Pasadena	Under Construction
11	A Noise Within	Mixed-Use	350 seat theatre; 212 unit residential project with underground parking	3330 E. Foothill Blvd, Pasadena	CUP & Variance Under Review
11	SMV/BRE Residential	Residential	188 residential units	3360 E. Foothill Blvd, Pasadena	Under Construction
11		Mixed-Use	Four story project with 90 units, 1,500 sq ft commercial and underground parking	1299 E. Green St, Pasadena	Under Construction
11	Cogent/ Broadreach	Office Park	381,000 sq ft master planned office park	465 N. Halstead St, Pasadena	PAC Under Review
11	Rose Estates	Residential	35 new single-family homes	1000 Rose Ave, Pasadena	Grading Permit Issued
11	PSP Sierra Madre	Commercial	216,451 sq ft self-storage facility	3111 E. Sierra Madre Blvd, Pasadena	
11	Sierra Madre Townhouse	Residential	71 townhomes	200 S. Sierra Madre Blvd, Pasadena	PAC Completed
11	Madre Villa Estates	Residential	28 unit subdivision	800 Sierra Madre Villa Ave, Pasadena	Under Construction
EAST PASADENA (Los Angeles County)					
11	PM061753	Residential	To create four single-family parcels on 0.63 acres	3901 Sycamore Ave, East Pasadena	CUP Approved
11	1523	Commercial	Construction of a motel	3570 Colorado Blvd, East Pasadena	CUP Approved
11	PM062014	Residential	Create two single-family parcels on 2.94 acres	2224 Villa Heights Rd, Pasadena	Tentative Map Approved

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
EAST SAN GABRIEL (Los Angeles County)					
11	TR061866	Residential	Ten attached condos/townhomes	9156 Huntington Dr., East San Gabriel	Tentative Map Application In Progress
11	PM061869	Residential	To create three single-family lots on 0.54 acres	8375 Beverly Dr., East San Gabriel	Tentative Map Application In Progress
11	TR061617	Residential	To create one multi-family lots on 0.91 acres	8356 & 8362 Sheffield Rd., East San Gabriel	Tentative Map Application Approved
11	PM062355	Residential	Four single-family lots	5639 Angelus Ave., East San Gabriel	Tentative Map Application In Progress
11	TR062863	Residential	21-unit condominium complex	5006, 5012, 5020 Bartlett St., East San Gabriel	Tentative Map Application In Progress
11	TR066664	Residential	Nine condos on one lot	8300 Longden Rd., East San Gabriel	Tentative Map Application In Progress
11	TR065808	Residential	19 new condo units	9128 Huntington Dr., East San Gabriel	Tentative Map Application In Progress
11	PM068770	Residential	One multi-family lot with three detached condos	5019 Acacia St., East San Gabriel	Tentative Map Application In Progress
11	PM068770	Residential	Two-lot subdivision	5334 Burton Ave., East San Gabriel	Tentative Map Application In Progress
CITY OF ARCADIA					
11	Santa Anita Westfield Shopping Expansion	Commercial	Additional 250,000 sq ft	400 S. Baldwin Ave., Arcadia	N/A
11	ADR 07-17	Residential	Eight-unit condominium	724 Fairview Ave., Arcadia	N/A
11	ADR 07-19	Industrial	Industrial masonry building	11626 Clark St., Arcadia	N/A
CITY OF TEMPLE CITY					
11		Residential	2,907 sq ft two-story five bedroom/five bathroom	8636 Longden Ave., Temple City	N/A
11		School	New preschool including 8 classrooms, office and kitchen	6529 Rosemead Blvd, Temple City	N/A
11		School	One-story preschool including 7 classrooms and an office	6515 Rosemead Blvd, Temple City	N/A
11		Residential	1,918 sq ft two-story single-family residence	9401 Longden Rd., Temple City	N/A
11		Residential	1,918 sq ft two-story single-family residence	9403 Longden Rd., Temple City	N/A
11		Residential	1,896 sq ft one-story single-family residence	8855 Elm Ave., Temple City	N/A
11		Residential	2,674 sq ft two-story single-family residence	5989 Ivar Ave., Temple City	N/A
11		Residential	Two-story single-family residence	6164 Muscatel Ave., Temple City	N/A
11		Residential	2,961 sq ft single-family residence	5922 Ivar Ave., Temple City	N/A
11		Residential	2,255 sq ft two-story single-family residence	8622 Garibaldi, Temple City	N/A
11		Residential	9,880 sq ft single-family residence	5008 Rosemead Blvd, Temple City	N/A

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
11		Residential	2,662 sq ft two-story residence	8815 Hermosa Dr., Temple City	N/A
11		Residential	1,959 sq ft two-story single-family residence	6206 Rosemead Blvd, Temple City	N/A
11		Residential	1,867 sq ft two-story single-family residence	6208 Rosemead Blvd, Temple City	N/A
SAN GABRIEL (Los Angeles County)					
11	PM061764	Residential	Two detached condos	6825 Lotus Ave., San Gabriel	N/A
11	PM061844	Residential	Two single-family lots on 0.40 acres	9439 Naomi Ave., Arcadia	N/A
11	PM062033	Residential	One multi-family lot with four single-family detached condos on 0.54 acres	9105 Ardendale Ave., San Gabriel	N/A
11	R2005-01996	Residential	28 senior apartments	8946-48 Duarte Rd., San Gabriel	N/A
11	PM065871	Residential	Four condo units	9622 Naomi Ave., Arcadia	N/A
11	PM065940	Residential	Two-unit condo	6361 Lemon Ave., Arcadia	N/A
11	PM067164	Residential	Three-lot subdivision	8809 Fairview Ave., San Gabriel	N/A
11	TR068037	Residential	One multi-family lot with nine single-family detached condos on 0.45 acres	9012 Fairview Ave., San Gabriel	N/A
CITY OF SAN GABRIEL					
11	William Culter	Mixed-Use	Mixed-use building and townhomes	221 E. Valley Blvd, San Gabriel	Under Review
11	Michael Hsiao	Multi-Family Residential	New three-unit condominiums	1920 Strathmore Ave., San Gabriel	Tentative Parcel Map Under Review
11	Paul Chen	Mixed-Use	Mixed-use building	130 Mission Dr., San Gabriel	Tentative Tract Map Under Review
11	Alex Chang	Senior Housing	12-unit senior condominiums	35 Hampton Court, San Gabriel	Tentative Tract Map Under Review
11	Kingdom Construction, Inc.	Residential	Tentative Map Extension	1409 Stevens Ave., San Gabriel	Approved
11	Patrick Yang	Residential	New eight-unit condominiums	116 Marshall St., San Gabriel	Under Review
11	Paul Ahm	Mixed-Use	New mixed-use condos (3) and retail spaces (3)	902 E. Mission Dr., San Gabriel	Under Review
11	Hank Jong	Residential	Tentative Map Extension	1309 Stevens, San Gabriel	Approved
11	Hank Jong	Residential	Tentative Map Extension	1915 Denton, San Gabriel	Approved
11	Hank Jong	Residential	Tentative Map Extension	126-130 E. Broadway, San Gabriel	Approved
SOUTH SAN GABRIEL/ROSEMEAD (Los Angeles County)					
11	PM062380	Residential	Create one multi-family lot with four detached condos on 0.83 acres	1605 Delta St., San Gabriel	Tentative Map In Progress
11	PM063158	Residential	Two single-family lots on 0.47 acres	8102 Graves Ave., Rosemead	Tentative Map In Progress
11	PM063101	Residential	Two single-family lots	1523 Delta St., San Gabriel	Tentative Map In Progress
11	PM063165	Residential	Three single-family lots on 0.73 acres	7815 Steddom Dr., Rosemead	Tentative Map In Progress
11	TR063876	Residential	Five single-family lots on one acre	7648 Sunside Dr., Rosemead	Tentative Map In Progress

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
11	TR063315	Residential	Six-unit condo project	1423 Potrero Grande Dr., Rosemead	Tentative Map In Progress
11	TR068521	Residential	Five single-family lots on 0.30 acres	1433 Potrero Grande Dr., Rosemead	Tentative Map In Progress
CITY OF ROSEMEAD					
11		Mixed-Use	38 Condos - 39,062 s.f. [38 X 1 BR (728 to 729 s.f.)] Retail - 10,586 s.f	9400-9412 Valley, Rosemead	Under Review
11		Mixed-Use	36 Condos - 42,288 [4 X 3 BR (1,330 s.f.) & 32 X 2 BR (760 to 1,218 s.f.)] Retail - 5,865 s.f. Restaurant - 5,640 s.f.	3212-3232 Del Mar, Rosemead	Under Review
11		Mixed-Use	32 Condos - 38,065 s.f. [30 X 2 BR (808 to 1,062 s.f. & 2 X 1 BR (1,250 to 1,375 s.f.)] Retail and Office - 6,685 s.f. Restaurant - 4,160 s.f.	3862 Rosemead/ 9016 Guess, Rosemead	Under Review
11		Mixed-Use	50 Condos - 60,820 s.f. [42 X 2 BR (1,120 to 1,480 s.f.) & 8 X 3 BR (1,460 s.f.)] Retail - 20,100 s.f	7801-7825 Garvey, Rosemead	Under Review
11		Mixed-Use	127 Condos - 145,649 s.f. [30 X 1 BR (855 s.f.) & 94 X 2 BR (1,205 to 1,355 s.f.) & 6 X 3 BR(1,388 to 1,660 s.f)] Retail - 41,400 s.f. Restaurant - 17,830 s.f.	7419-7459 Garvey, Rosemead	Under Review
11		Mixed-Use	15 Condos - 14,400 s.f. [13 X 2 BR (1,000 s.f.) & 2 X 1 BR (700 s.f.)] Retail - 5,200 s.f. Office - 5,264 s.f. Loft - 4,983 s.f.	8479 E. Garvey, Rosemead	Under Review
11		Mixed-Use	16 Condos - 22,426 s.f. [8 X 2 BR (1,211 s.f.) & 8 X 3 BR (1,402 s.f.)] Restaurant - 3,200 s.f. Office - 17,001 s.f.	8930-8932 Mission, Rosemead	Approved
11		Commercial Addition	Hotel expansion- 50 rooms	888 Montebello Blvd, Rosemead	
11		Residential	Two-lot Residential Subdivision	4118 Arica Ave., Rosemead	N/A
11		Office/Retail	New office/retail building	9800 Valley Blvd, Rosemead	N/A
11	Hubert Trieu	Single-Family Residential	Six single-family residential units	8444 Dorothy St., Rosemead	N/A
11	Lanh Tich Trinh	Single-Family Residential	Six single-family residential units	3049-3061 Ivar St., Rosemead	N/A
11	Ivan Ho	Single-Family Residential	Eight single-family residential units	4433-47 Walnut Grove, Rosemead	N/A
11	Bill Lau	Single-Family Residential	Twelve single-family residential units	8723-29 Mission Dr., Rosemead	N/A
11	Chin Sung Chen	Multi-Family Residential	16 condos	8930-32 Mission Dr., Rosemead	N/A
11	Nevis Homes	Multi-Family Residential	15 condos	3309-19 Del Mar Ave., Rosemead	N/A
11	Tom Lee	Single-Family Residential	Thirteen single-family residential units; two-story units between 2,250 & 2,365 sq ft; includes a new private street	4600-31 Singing Wood Ln., off Mission Rd. just east of San Gabriel Blvd in Rosemead	N/A
11	Union Pacific Funding	Single-Family Residential	Eight single-family residential units	8718-42 Bethanie, Rosemead	N/A

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
11	Sierra Eagle, LLC	Single-Family Residential	Six single-family residential units	7931-45 Whitmore, Rosemead	N/A
11	Peter and Brenda Jong	Single-Family Residential	Eight single-family residential units	7621-37 Garvalia St., Rosemead	N/A
11	Wen Tu Chen	Multi-Family Residential	Eight-unit apartment building	8858 Marshall St., Rosemead	N/A
11	8907 Glendon Way, LLC	Multi-Family Residential	Seven-unit apartment building	8907 Glendon Way, Rosemead	N/A
CITY OF MONTEREY PARK					
11	Cascades Marketplace	New Retail Center.	527,157 square feet retail center and 2,791 parking spaces	Southeast portion of the City of Monterey Park immediately north of the Pomona Freeway (State Route 60) and west of Paramount Boulevard	Approved project. Plan check and building permits not anticipated till 2010
CITY OF MONTEBELLO					
11	Montebello Hills Specific Plan	Planned residential community	488-acre property owned by Plains Exploration & Production Company (PXP) covering the Montebello oil field; community would include up to 1,200 detached and attached residential housing units	Located in the northeastern portion of the city, near the cities of Rosemead and Monterey Park to the north, and unincorporated areas of the County of Los Angeles and the Whittier Narrows Flood Plain to the east	Public Review Period for the Draft EIR Closed 5/09; the Final EIR will be presented to the Planning Commission and City Council in Summer 2009
CITY OF DUARTE					
7	Ohio/Capri Motels (Huntington Courts)	Single and multi-family housing units	192,640 sq ft (4.42 acres); 45 single-family units, 2 triplexes, total of 51 units	2145 Huntington Drive, Duarte	Approved by City Council, County approvals are pending, grading has begun
7	Attalla Ranch Project	Residential ; single-family housing units	15-lot Residential Subdivision for 15 single-family detached units (sq ft ??)	City of Duarte - north of Sunnydale, east of Las Lomas, located in the foothills	Architectural application pending
7	1569 Huntington (First Wok)	Single and multi-family housing units	17-unit housing that consists of 2 two-unit duplexes and 13 single-family units	1569 Huntington Drive, Duarte	Grading has been Complete, building permits have been issued, scheduled to be Complete by April 2008
7	Duarte Trailer Park/Anita Motel	Land banked property	One-acre site; intended use not yet determined	1437 & 1423 Huntington Drive, Duarte	Land banked by the City until completion of the downtown Duarte task force study

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
7	Texaco - 1263 Huntington Drive	Commercial	4,874 square foot quick serve restaurant featuring three national chains on one-half acre	1263 Huntington Drive, Duarte	Disposition and Agreement in progress
7	Lerner's Gas Station Site	Mixed-used commercial and office	Two-story mixed use with a total of 6,635 sq ft; 1st floor 1,410 sq ft restaurant & 1,748 sq ft office, 2nd floor 3,477 sq ft office	Northeast corner of Huntington Dr and Bradbourne Ave, City of Duarte	Site plan approval is pending
7	Maryvale	Expansion of a child care facility	Replace the existing 1,600 square foot building with a 34,000 square foot two-story complex on 1.4 acres	2502 Huntington Drive, Duarte	Application is pending; construction is expected to commence in 6 to 9 months
7	Royal Liquor and Gun Store Property	Commercial	1.38 acre site, acquired by the Re Agency, intended use is has not yet been determined	2400-2404 Huntington Drive, Duarte	N/A
7	Mountain Avenue North of 210 Freeway	Commercial	Best Buy store and in-line shops	N/A	City Council approved a DDA
7	Northeast Corner of Huntington & Buena Vista (Big Lots)	Commercial	8-acre site	Huntington and Buena Vista, Duarte	Site plan approval is pending
CITY OF BRADBURY					
7		Residential	Estate dwelling	Northeast Bradbury near border of ANF	Under construction
7		Residential	Estate dwelling	Northwest Bradbury adjacent to City of Monrovia	Under construction
CITY OF IRWINDALE					
7	Restaurant, Convenience Store, Gas Station	Commercial	2,315 sq ft restaurant with drive-thru; 2,572 sq ft convenience store; gas station with six double-sided pumps	5200 Rivergrade Rd., Irwindale	Approved and in plan check
7	Our Lady of Guadalupe	Religious Facility	12,227 sq ft sanctuary	16025 Cypress St., Irwindale	Approved, plans not yet submitted
7	Gas Station and Car Wash	Commercial	2,236 sq ft car wash; 3 double-sided gas pumps	15602 Arrow Highway, Irwindale	N/A
7	Irwindale Business Park	Industrial/ Office	Three industrial buildings totaling 73,350 sq ft, including office, warehouse/distribution and manufacturing	5352, 5354 and 5360 Irwindale Ave., Irwindale	Under Construction
7	Hallett Boats	Manufacturing Retail	Boat manufacturing, showroom and sales; four buildings totaling 69,000 sq ft	4600 Rivergrade Rd., Irwindale	Construction almost complete
7	Arco Self-Serve Car Wash	Commercial	990 sq ft car wash; 260 sq ft office/storage room	16000 Foothill Blvd, Irwindale	Approved and under construction
7	Los Angeles Engineering	Industrial/ Office	19,350 sq ft office/truck maintenance facility	201 East Longden Ave., Irwindale	Approved, not yet in plan check
7	Vulcan Materials Company	Entitlement Extension-Reliance I Quarry	Proposal is to continue mining to a depth of 440 ft below ground surface or until 2050, whichever occurs first; currently scheduled to end in 2009	16001 Foothill Blvd, Irwindale	N/A

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
7	City of Hope	Office	59,984 sq. ft. office/research/ transfusion building	1500 East Duarte Rd., Irwindale	Went before City Council on 9/26/07
7	Proposed motel	Commercial	75-80 room hotel with a 4,200 sf restaurant and 15,000 sq ft of retail/ office.	15744 Arrow Highway – APN 8417-035-902	Formal application has not been submitted. Exclusive Negotiating Agreement with a developer
7	Proposed manufacturing building	Industrial	Manufacturing building proposal with 26,000 sq ft of office space; 408,000 sq ft warehouse; and 150,000 sq ft of manufacturing.	Northeast Corner Azusa Canyon Road and Cypress Street – APN 817-001-916	Formal application has not been submitted. Exclusive Negotiating Agreement with a developer.
CITY OF EL MONTE					
7	DR 02-06	Light Manufacturing	2,000 sq ft storage building	4455 Arden Dr., El Monte	Design Review Approved
7	LD 669, CUP 06-06	Residential	Three-unit PUD	4427 Bannister Ave., El Monte	N/A
7	TTM 63511, CUP 27-05	Residential	Project addition- construct seven additional dwelling units to an existing seven-unit project at 10938 Basye Ave.	10930 Basye St., El Monte	Application in Progress
7	CUP 20-06	Residential	Six-unit PUD	11028-11038 Basye St., El Monte	N/A
7	LD 675, CUP 31-06	Residential	Three-unit PUD	11643 Bryant Rd., El Monte	In Plan Check
7	TTM 66120, CUP 07-06	Residential	One-story four-unit PUD	11414 Cherrylee Dr., El Monte	TTM and CUP Approved
7	LD 662	Residential	Subdivide a 17,450 sq ft lot to develop a two-unit planned residential	11727 Cherrylee Dr., El Monte	Lot Division Approved
7	TTM 63223	Planned Residential	To annex a 5.2 acre site from the City of Arcadia to develop a 34-unit PRD	Clark St. and Durfee Ave., El Monte	Incomplete Application
7	LD 616, CUP 02-03	Residential	Three-unit PUD	12056 Clora Pl., El Monte	Approved Time Extenstion for LD and CUP
7	LD 653	Residential	Subdivide a 20,250 sq ft lot to develop a two-unit planned residential	4123 Cogswell Rd., El Monte	Application Process Closed
7	LD 676	Residential	Two-unit PUD	4414 Cogswell Rd., El Monte	Lot Division Approved
7	LD 674, CUP 29-06	Residential	Three-unit PUD	4516-18 Cogswell Rd., El Monte	Lot Division Approved
7	TTM 65351, CUP 46-05	Residential	Subdivide a parcel into six residential lots	12041-51 Deana St., El Monte	TTM and CUP Approved
7	LD 665	Residential	Subdivide a parcel into two residential lots	12340 Deana St., El Monte	Lot Division Approved

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
7	CUP 18-05	Residential	Establish and construct three dwelling unit on a property consisting of 15,189 sq ft	11229 Dodson St., El Monte	Application Process Closed
7	CUP 29-05	Residential	Establish and construct three dwelling unit on a property consisting of 21,876 sq ft	3708-10 Durfee Ave., El Monte	Application Process Closed
7	LD 766, CUP 33-06	Residential	Three-unit PUD	4327 Durfee Ave., El Monte	Lot Division Approved
7	LD 681	Residential	Two-unit PUD	11664 Ferris Rd., El Monte	Lot Division Approved
7	LD 663	Residential	Subdivide a 14,140 sq ft lot to develop a two-unit planned residential	12027 Ferris Rd., El Monte	Lot Division Approved
7	DR 04-07	Commercial	Office building	9650 Flair Rd., El Monte	Design Review Approved
7	DR 11-05	Commercial	Design review and variance to construct a new 2,750 sq ft one-story commercial building	10353 Garvey Ave., El Monte	Application Process Closed
7	CUP 49-04, DR 19-04	Special Use	Construct an 8,000 sq ft religious institution	11040-44 Garvey Ave., El Monte	CUP and Design Review Approved
7	DR 14-05	Commercial	2,868 sq ft building	11812 Garvey Ave., El Monte	Design Review Process Closed
7	CUP 18-06	Commercial	El Pollo Loco restaurant wth a drive-thru	11928 Garvey Ave., El Monte	CUP Process Closed
7	DR 03-06	Commercial	42,000 sq ft office and warehouse addition	9904-06 Gidley St., El Monte	Design Review Process Closed
7	TTM 65551, CUP 01-06	Residential	Consolidate two parcels and subdivide the resulting parcel into four residential lots	9846-50 Giovane St., El Monte	TTM and CUP Approved
7	DR 22-05	Light Manufacturing	3,600 sq ft warehouse building	10950 Grand Ave., El Monte	Design Review Process Closed
7	LD 680	Residential	Two-unit PUD	11336 Hallwood Dr., El Monte	Lot Division Application In Plan Check
7	TTM 66929, CUP 30-06	Residential	Four-unit PUD	11640 Hallwood Dr., El Monte	TTM and CUP Approved
7	TTM 67296, CUP36-06	Residential	Five-unit PUD	3131 Havenpark Ave., El Monte	TTM and CUP Approved
7	LD 668, CUP 31-05	Residential	Subdivide a 18,896 sq ft parcel into four residential lots	12327 Kerrwood St., El Monte	Application Process Closed
7	LD 666	Residential	Two-unit PUD	11822-26 Killian St., El Monte	Lot Division Approved
7	LD 683, Variance 06-06	Residential	Two-unit PUD	4566 La Madera Ave., El Monte	Lot Division and Variance Approved
7	LD 672	Residential	Two-unit PUD	5356 La Madera Ave., El Monte	Lot Division Approved
7	LD 659, CUP 38-05	Residential	Subdivide an 18,000 sq ft parcel to construct a three-unit planned residential	11742 Lansdale Ave., El Monte	Lot Division and CUP Process Closed

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
7	LD 671, CUP 11-06	Residential	Three-unit PUD	11338 Lower Azusa Rd., El Monte	Lot Division and CUP Approved
7	LD 656, CUP 34-05	Residential	Subdivide a 12,632 sq ft parcel to construct a two-unit planned residential	11511 Lower Azusa Rd., El Monte	Lot Division and CUP Approved
7	CUP 57-04, DR 22-04	Commercial	Construct a CVS Pharmacy	11574 Lower Azusa Rd., El Monte	Application Process Closed
7	TTM 64986, CUP 17-06	Residential	Four-unit PUD	11646 Lower Azusa Rd., El Monte	TTM and CUP Approved
7	LD 661, Variance 20-05	Residential	Subdivide a 14,910 sq ft lot to develop a two-unit planned residential	11920 Lower Azusa Rd., El Monte	Application Process Closed
7	LD 679	Residential	Two-unit PUD	12012 Lower Azusa Rd., El Monte	Lot Division Approved
7	TTM 62949, CUP 23-05	Residential	Subdivide a 33,641 sq ft lot to develop four residential lots	12034 Lower Azusa Rd., El Monte	Application Process Closed
7	CUP 39-05, DR 23-05	Light Manufacturing	Establish a self storage facility in conjunction with industrial office and warehousing use	3133 Maxson Rd., El Monte	CUP and Design Review Approved
7	CUP 45-05	Light Manufacturing	Establish auto repair facility in M-1 zone	3330 Maxson Rd., El Monte	Application Process Closed
7	TTM 67293, CUP 32-06	Residential	Four-unit PUD	4249 Maxson Rd., El Monte	TTM and CUP Applications In Progress
7	CUP 40-06, DR 11-06	Commercial	New auto repair	2614 Merced Ave., El Monte	CUP and Design Review Approved
7	CUP 03-07, DR 03-07	Commercial	New single tenant warehouse	2658 Merced Ave., El Monte	CUP and Design Review Approved
7	LD 660, CUP 40-05	Residential	Subdivide a 18,857 sq ft parcel to construct a three-unit planned residential	2652 Mountain View Rd., El Monte	Lot Division and CUP Approved
7	LD 654, Variance 12-04	Residential	Subdivide a 7,919 sq ft parcel to construct a two-unit planned residential	2630 Nevada Ave., El Monte	Application Process Closed
7	LD 638	Residential	Two-unit PUD	2816-18 New Deal Ave., El Monte	Time Extension for Lot Division Approved
7	LD 678, CUP 34-06	Residential	Three-unit PUD	2104 Parkway Dr., El Monte	Application Process Closed
7	CUP 27-06	Residential	Third residential unit on a lot	2133 Parkway Dr., El Monte	CUP In Plan Check
7	LD 682, Variance 05-07	Commercial	Consolidate five parcels to make two lots for a new shopping center	3607 Peck Rd., El Monte	In Appeal
7	DR 18-05	Commercial	Two-story office building	4014 Peck Rd., El Monte	Design Review Approved
7	TTM 63193, CUP 13-05, Variance 10-05, DR 13-05	Mixed-Use	Establish a mixed-use project consisting of a 69,416 sq ft four-story building, 49 senior condominium units, 6,483 sq ft of office/commercial use, and 3,439 sq ft of restaurant use	4151 Peck Rd., El Monte	Application Process Closed

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
7	CUP 35-05, Variance 17-05, DR 20-05	Commercial	Establish a multiple tenant retail/office building	4610 Peck Rd., El Monte	Application Process Closed
7	TTM 68444, CUP 45-06 Variance 08-06, DR 13-06	Mixed-Use	Senior housing and retail	4704-16 Peck Rd., El Monte	TTM and CUP Approved
7	CUP 09-5-05, DR 05-05	Commercial	New commercial building and multi-tenant auto repair	4727 Peck Rd., El Monte	Application Process Closed
7	TTM 64283, CUP 33-05	Residential	Consolidate two parcels and subdivide the resulting 41,625 sq ft parcel into eight residential lots	5344 Peck Rd., El Monte	Application Process Closed
7	LD 684, CUP 43-06	Residential	Three-unit PUD	3646 Penn Mar Ave., El Monte	Lot Division and CUP Approved
7	TTM 65404, CUP 05-06	Residential	Four-unit PUD	4012 Penn Mar Ave., El Monte	TTM and CUP Approved
7	LD 673	Residential	Two-unit PUD	11642 Ranchito St., El Monte	In Plan Check
7	TTM 67002, CUP 23-06	Residential	Four-unit PUD	12044 Ranchito St., El Monte	TTM and CUP Approved
7	TTM65926, CUP 09-06	Residential	Four-unit PUD	3838 Richwood Ave., El Monte	TTM and CUP Approved
7	LD 657	Residential	Subdivide a 16,018 sq ft parcel into two residential lots	4012 Richwood Ave., El Monte	Application Process Closed
7	CUP 19-05, LD 652	Residential	Subdivide a 24,000 sq ft parcel into three residential lots	4202 Richwood Ave., El Monte	Application Process Closed
7	LD 670, CUP 08-06	Residential	Three-unit PUD	4234 Richwood Ave., El Monte	In Plan Check
7	LD 687, CUP 12-07	Residential	Three-unit PUD	12020 Roseglen St., El Monte	Incomplete Application
7	LD 655	Residential	Subdivide a 15,412 sq ft parcel into two residential lots	12106 Roseglen St., El Monte	Application Process Closed
7	TTM 64497, CUP 13-06	Residential	53-unit PUD	4177 Rowland Ave., El Monte	TTM and CUP Approved
7	TTM 68798	Mixed-Use	Transit Village	3629-69 Santa Anita Ave., El Monte	Needs City Council Approval
7	DR 21-05	Commercial	Three-story office building	4548 Santa Anita Ave., El Monte	Application Process Closed
7	CUP 39-06, DR 10-06	Community	Community Center	4548 Santa Anita Ave., El Monte	CUP and Design Review Approved
7	CUP 48-05	Residential	Three-unit PUD	11039 Schmidt Rd., El Monte	Lot Division and CUP Pending
7	TTM 67914, CUP 44-06	Residential	Eleven-unit PUD	2620-34 Tyler Ave., El Monte	Needs City Council Approval
7	CUP 05-07	Commercial	Auto mechanic shop	2880 Tyler Ave., El Monte	CUP Approved
7	TTM 54087	Residential	Time extension for a previously approved 18-unit planned residential	3300 Tyler Ave., El Monte	Application Process Closed

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
7	DR 19-05	Commercial	Expand existing office and warehouse complex- construction of 56,478 sq ft new office space; 26,099 sq ft of renovations; a new four-story parking structure; and 20,000 sq ft addition of warehouse space	10515-29 Valley Blvd, El Monte	Application Process Closed
7	CUP 28-06	Commercial	Health fitness center	11838 Valley Blvd, El Monte	Application Process Closed
7	DR 05-07	Light Manufacturing	New industrial building	Valley Blvd, east of Gilman and west of SG River, El Monte	Design Review Pending
7	TTM 626590, CUP 15-05	Residential	Subdivide a 25,058 sq ft parcel to construct a five-unit planned residential	11042 W. Hondo Pkwy, El Monte	TTM and CUP Approved
7	LD 667	Residential	Two-unit PUD	4634 Whistler Ave., El Monte	Lot Division Approved
7	LD 688, CUP 14-07	Residential	Add two units for a three-unit PUD	12111 Hemlock St., El Monte	Lot Division and CUP Pending
7	TTM 69080, CUP 17-07	Mixed-Use	Senior housing and commercial use	11605 Garvey Ave., El Monte	N/A
7	TTM 69088, CUP 18-07	Commercial	New offices and warehouses	4000 Arden Dr., El Monte	TTM and CUP Pending
7	LD 689	Residential	Two-unit PUD	4123 Bannister Ave., El Monte	Lot Division Pending
7	LD 690	Residential	Two-unit PUD	11434 Hallwood Dr., El Monte	Lot Division Pending
7		Commercial	New office/warehouse building	5436 Durfee Ave., El Monte	N/A
CITY OF SOUTH EL MONTE					
7, 8A	Santa Anita and Merced Ave.	Residential and Commercial	Construction of 13 single-family homes and 150,000 sq ft of commercial	Santa Anita and Merced Ave., South El Monte	Phase I of the residential is complete; commercial is in progress
7, 8A	Plaza Del Sol Shopping Center	Commercial	Nine-acre commercial site	Durfee and Thienes Ave., South El Monte	N/A
CITY OF PICO RIVERA					
8A	TTM 060630, CUP 633,	Single-Family Residential	Create a 7-lot residential subdivision to construct 7 two-story single-family homes	Durfee and Gallatin, Pico Rivera	N/A
8A	TTM 65563, CUP 647,	Multi-Family Residential	One-lot residential subdivision for a 14-unit condominium project	3928 Rosemead Blvd, Pico Rivera	N/A
8A	PPD 500	Commercial	New real estate office building	9244 Beverly Rd., Pico Rivera	N/A
8A	PPD 490	Single-Family Residential	3 single-family dwellings	8623 Beverly Rd., Pico Rivera	N/A
8A	CUP 641.1	Retail	Pico Rivera Market Place	8909 Washington Blvd, Pico Rivera	Construction Monitoring Project- Under Construction
8A	CUP 596.1	Retail/Commercial Development	Pico Rivera Village Walk 15- Movie theatre and shopping center	Whittier/Paramount	Construction Monitoring Project- Under Construction

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
8A	CUP 639	Multi-Family Residential	9-unit condominium	3916 Rosemead Blvd, Pico Rivera	Construction Monitoring Project- Under Construction
8A	N/A	Commercial	7,000 sq ft commercial pad	8878 Whittier Blvd, Pico Rivera	Construction Monitoring Project
8A	CUP 632	Commercial	Howard Johnson Motel- 1.12-acre hotel	9515 Whittier Blvd, Pico Rivera	Construction Monitoring Project- Under Construction
8A	PPD 475	Commercial	Yellow Freight Systems	9933 Whittier Blvd, Pico Rivera	Construction monitoring project- under construction
8A	CUP 645.1	Retail	Pico Plaza- Three retail pads	9311-9321 Whittier Blvd, Pico Rivera	Construction monitoring project- under construction
8A	PPD 496	Retail	Auto Zone- 7,381 sq ft retail	9234 Slauson Ave., Pico Rivera	Construction Monitoring Project- Under Construction
8A	PPD 498	Retail	Used car sales lot	8642 E. Beverly Blvd, Pico Rivera	Construction monitoring project- Awaiting plan submittal and permit issuance
8A	CUP 637	Commercial	Royal Motel- 24-unit motel	9431 Whittier Blvd, Pico Rivera	Construction Monitoring Project- Awaiting resubmittal if grading plans
8A	PPD 489	Office	Office building	4029 Rosemead Blvd, Pico Rivera	Construction Monitoring Project
8A	N/A	Office	Office building	4101 Rosemead Blvd, Pico Rivera	Construction Monitoring Project
CITY OF LA PUENTE					
8A	Duck Farm Park Project	Park	Includes 14-acre riparian corridor, 4-acre plant nursery, 2-acre wildflower meadow, 1-acre pocket park	Northern portion of the former Woodland Duck Farm along the San Gabriel River	Conceptual Planning Phase In Progress
8A		Residential	Three single-family lots on 1.54 acres	649 S. 3rd Ave., La Puente	Tentative Map Recorded
8A		Residential	One multi-family lot with 109 detached condominiums on 17.59 gross acres	323 Workman Mill Rd., La Puente (Avocado Heights)	Tentative Map In Progress
8A		Residential	Eleven single-family lots on 1.05 acres	19280 Colima Rd., La Puente	Tentative Map and CUP In Progress
8A		Industrial	Four industrial lots on 3.55 acres	207 6th Ave., La Puente	Tentative Map Approved

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
8A		Residential	Five single-family lots on 0.88 acres	227 Orange Blossom Ave., La Puente	Tentative Map In Progress
8A		Residential	Two condo units	13823 Lomitas Ln., La Puente	Tentative Map In Progress
8A		Residential	Two single-family lots on 0.44 acres	139 Orange Blossom Ave., La Puente	Tentative Map In Progress
8A		Residential	Nine single-family lots	1126 Willow Ave., La Puente	Tentative Map In Progress
HACIENDA HEIGHTS (Los Angeles County)					
8A	PM061779	Residential	Two-lot subdivision	1142 Kwis St., Hacienda Heights	Tentative Map Application Approved
8A	PM01855	Residential	Three detached condos	1214-16 Galemont Ave., Hacienda Heights	Tentative Map Application In Progress
8A	R2004-00387	Commercial	Alternative healing establishment on 30,932 sq ft	1121 Hacienda Blvd, Hacienda Heights	CUP Approved
8A	R2004-00387	Commercial	Message/day spa establishment	15882 Gale Ave., Hacienda Heights	CUP Approved
8A	PM062989	Residential	Three single-family lots on 0.51 acres	15443 Garo St., Hacienda Heights	Tentative Map Application Approved
8A	PM063841	Residential	To create one multi-family lot with four detached condos on 0.81 acres	1431 Dunswell Ave., Hacienda Heights	Tentative Map Application In Progress
8A	TR06344	Residential	To create one multi-family lot with five detached condos on 0.94 acres	1127 Kwis St., Hacienda Heights	Tentative Map Application In Progress
8A	PM063463	Residential	Three-lot subdivision	2576 Turnbull Canyon., Hacienda Heights	Tentative Map Application In Progress
8A	TR065296	Residential	Ten single-family lots	15577 Denley St., Hacienda Heights	Tentative Map Application In Progress
8A	CP 999	Commercial	Two commercial structures- 8,000 sq ft liquor store and a 1,353 sq ft restaurant	2541 Hacienda Blvd, Hacienda Heights	CUP Approved
8A	R2006-02213	Commercial	Multi-tenant shopping center	2020 Hacienda Blvd, Hacienda Heights	CUP Application In Progress
8A	TTM 51153 Pacific Heights	Residential	114.3-acre site; 47 single-family lots; water tank; private driveways and fire lanes; open space	Undeveloped area north of La Habra Heights and	EIR In Progress
CITY OF BREA					
8A	Canyon Crest	Residential	367-acre site; 165 single-family dwellings	East end of Carbon Canyon, northwest of Carbon Canyon Rd, Brea	Under Review
8A	Greg Jones	Retail	Construct a new retail building	Northeast corner of Site Dr. and Central Ave, Brea	Under Review
8A	James McGrade	Residential	Subdivide a 70,950 sq ft parcel into two parcels and construct a single-family residence	1696 N. Puente, Brea	Approved
8A	Bruce Ward	Residential	Construct 7 condominium units	128 and 148 Olinda Dr., Brea	Approved
8A	Olen Development	Residential	Construct 260 apartments	555 Pointe Dr., Brea	Approved
8A	Burke Real Estate Group	Commercial	Construct industrial business park	195 N. Puente St., Brea	Approved

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
CITY OF DIAMOND BAR					
8A	Jewel Rich, LLC	Single-Family Housing	12.9-acre site; 16-lot Residential Subdivision; includes single-family units and open space	Crooked Creek Dr.	Approved
LOS ANGELES COUNTY (Near the City of Diamond Bar)					
8A	Aera Master Planned Community	Master Planned Community	2,935 acres; 3,600 residential units including estates, single-family homes, townhomes and senior housing; 1,670 acres (55% of total acreage) of open space including a golf course; 300,000 sq ft of mixed use commercial and office space; school site and fire station site reserved	90 percent of the property is unincorporated Los Angeles County, 10 percent is unincorporated Orange County; proposed annexation agreement with the City of Diamond Bar	Draft EIR In Progress
CITY OF YORBA LINDA					
8A	Vista Del Verde	Master Planned Golf Community	843-acre site; 2,100 single-family dwellings, golf course, 10 acres of parks, 73 acres of open space	Yorba Linda Blvd and Imperial Highway	Approved - Construction In Progress
8A	Shapell North Yorba Linda Estates	Residential	3 components- TTM 16209 - 315 single-family lots TTM16208 - 168 single-family lots TTM16987 - 228 multi-family lots	Northwest and northeast quadrants of Fairmont Blvd and Bastanchury Rd	Construction In Progress
8A	Hover Development	Residential	50 single-family lots	Northwest corner of Bastanchury Rd and Lakeview Ave	Graded, Not Yet Under Construction
8A	TTM 16488	Residential	11 single-family lots	Northern terminus of Casino Ridge Rd	N/A
8A	Yorba Linda High School	School	2,000 student school	Southwest corner of Fairmont Blvd and Bastanchury Rd	Under Construction
8A	Friends Christian High School	School	1,200 student school	North of Bastanchury Rd between Casa Loma Ave and Eureka Ave	Approved, Not Yet Under Construction
CITY OF CHINO HILLS					
8A	Crossroads Entertainment Center	Commercial entertainment center	32-acre site, 18-screen theater complex, 104-room hotel; restaurants, office buildings, day care center, gas station, total of 170,681 sq ft of building area	North end of Chino Ave., Chino Hills	N/A
8A	Crossroads Community Church	Worship/ fellowship center; education center; outdoor plaza	3.99-acre site; 17,446 sq ft worship center, 14,280-sq ft education center with day care; 7,850-sq ft outdoor plazas with a playground and parking	Northeast corner of Grand Ave. and Madrugada Dr., Chino Hills	N/A
8A	The Shoppes at Chino Hills	Mixed-Use	550,000-sq ft retail center; 235 multi-family dwelling units; 200,000-sq ft civic center; community park with 125 multi-family dwelling units	Southeast corner of Grand Ave. and Peyton Dr., Chino Hills	N/A
8A	Hanaro	Church	4.7-acre site; 11,612 sq ft church	English Rd., Chino Hills	N/A
8A	Windmill Creek Condos	Residential	Two-story , 29-unit condominium	Ridgeview Dr. and Windmill Creek Rd., Chino Hills	N/A
8A	CVS Pharmacy and Retail	Retail Center	3.48-acre site; 24,220 sq ft retail center	N/A	N/A
8A	Walgreens	Retail	1.63-acre site; 14,820 sq ft space with drive-thru pharmacy	N/A	N/A

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
8A	The Courts in Chino Hills	Commercial, retail, office	123,349 sq ft space, including four single-story buildings including two fast food tenants, ten offices buildings, and five two-story office buildings	Pipeline Ave., Chino Hills	N/A
8A	Jolon Gardens	Residential	A tentative tract map and design review to subdivide a 2.74-acre parcel into 13 single-family residences	Jolon St and Aqueduct Lane, Chino Hills	Under Review
8A	Terrace Drive Commons	Residential	Tentative tract map application for Residential Subdivision of a 1.32-acre parcel for 17 condominium units	Terrace Dr. between Orange Grove Ave. and Aqueduct Lane, Chino Hills	Under Review
8A	The Commons	Commercial	493,084 sq ft of commercial	Ramona Ave. and Chino Hills Pkwy, Chino Hills	N/A
8A	BAPS Temple and Cultural Center	Worship and Cultural Center	20.31-acre site; 164,372 sq ft of building area	Located east of and adjacent to the SR-71 freeway, south of Chino Hills Parkway, east of Monte Vista Avenue and west of Central Avenue	N/A
8A	Country Club Estates	Residential	2.5-acres site; subdivide into 10 single-family residential lots	Bird Farm Rd. and Wallace Ave., Chino Hills	N/A
8A	Pomona Rincon Town Homes	Residential	4.73-acre site; construct 70 medium density residential units	Pomona Rincon Rd., Chino Hills	N/A
8A	Lago Los Serranos	Multi-family Residential	8.06-acre site; construct 95 multi-family town homes with a pool, spa and sports courts	Bird Farm Rd. and Ramona Ave., Chino Hills	N/A
8A	Pine Valley Estates at Western Hills by Meritage Homes	Single-Family Housing	192-acre site; construct 98 single-family detached homes	Rancho Hills Dr., Chino Hills	N/A
8A	Carbon Canyon Retail	Commercial	Two-story commercial building, 5,059 sq ft	Canyon Hills and Carbon Canyon Rd., Chino Hills	N/A
8A	Stonefield	Commercial	Construct a 5,059 s.f. two story commercial building	Canyon Hills & Carbon Canyon Road, Chino Hills	N/A
8A	Richard Meaglia	Single-Family Housing	Construct 12 single-family homes on a 6.7-acre site	Old Carbon Canyon and Pinnacle Road, Chino Hills	N/A
8A	Vellano	Single-Family Housing and Recreation	of 205 single-family detached residential , an 18-hole private golf course, clubhouse, swim and fitness center, a neighborhood park and an overlook park.	Woodview Rd., Chino Hills	N/A
8A	Woodview Terrace	Single-Family Housing and Recreation	of 247 single-family detached residential , a neighborhood park, a fire station site, nature park, and multipurpose trails	Pipeline Ave. and Woodview Rd., Chino Hills	N/A
8A	Canyon Estates	Single-Family Residential	of 59 single-family detached residential .	Soquel Canyon Pkwy, Chino Hills	N/A
8A	Holiday Inn Express Hotel and Suites	Commercial	Construct a 4-story, 54,998-square foot hotel and a 3,000-square foot restaurant pad.	Fairfield Ranch Business Park, Chino Hills	N/A
8A	Fieldstone Communities	Single-Family Residential	Construct 27 single-family lots on approximately 8 acres.	Los Serranos County Club Dr and Soquel Canyon Pkwy, Chino Hills	N/A
8A	Fieldstone Communities	Single-Family Residential	Construct 12 single-family lots on approximately 3.60 acres.	Soquel Canyon Pkwy and Pomona Rincon Rd., Chino Hills	N/A

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
8A	Country Club Medical Plaza	Office	Construct a 27,000 s.f. medical office building on a 2-site within the Albertsons Shopping Center	Soquel Canyon Road, Chino Hills	N/A
8A	Soquel Canyon Crossings	Commercial	Commercial project of approximately 93,500 sq. ft. of retail uses including a drug store, bank, general shops, and a super market on a 9.23-acre site. Also includes a Tentative Parcel Map for the Residential Subdivision of the property into one (1) residential and seven (7) commercial parcels	Soquel Canyon Crossings (Regency Centers); Northeast corner of Los Serranos Country Club Drive and Soquel Canyon Parkway	N/A
8A	Soquel Canyon Crossings Phase II	Retail	Construct a 35,300 sq ft retail center	Pomona Rincon and Soquel Canyon Rd., Chino Hills	N/A
8A	The Golden Triangle	Commercial and Retail	The project site is on a 10.67-acre parcel, consists of four buildings: ±60,000-square foot, three-story Medical Building with a sub-terrain parking garage, ±120 rooms, four-story Hotel, 5,025-square foot sit-down restaurant pad (P1), and, 3,500-square foot drive-in, Fast Food restaurant pad (P2). Not included in the resubmitted plans are the previously approved Building S3 (15, 600 square feet) and Building S4 (9,000 square feet) that will house both major and minor retail stores and food services.	Soquel Canyon Pkwy and Pomona Rincon Rd., Chino Hills	N/A
8A	Heritage Professional Center	Office and Retail	Construct a hospital, medical/office, and retail buildings (216,710 sq ft) on a 22-acre site	Pomona Rincon (across from Chino Hills High School)	N/A
8A	PD 9-163		Consists of 76 lots and 8 lettered lots on 140.18 acres.	Located north of Carbon Canyon Road and on the west of Canyon Hills Rd. Chino Hills	N/A
8A	Villa Borba	Single and Multi-Family Residential	336 acres; 351 single-family, 280 multi-family ; three neighborhoods propose (TT 15989 is one neighborhood)	West of Highway 71 between Butterfield Ranch and Hunter's Hill	On Hold
8A	Chino Hills Community Center	Cultural Use	18,500 sq ft community center	14575 Pipeline Ave., Chino HIlls	On Hold
CITY OF CHINO					
8B, 8C	Carson Company Final Phase Warehouse Project	Industrial	11.3 acres; 224,094 sq ft warehouse	16142 Fern Ave., Chino	To Be Complete 5/1/08
8B, 8C	Brad Henderson CNO Hangers, Inc.	Airport Development	Construct 128,800 sq ft of aviation hangars consisting of six building groups and 16,804 sq ft of optional two-story offices	7000 Merrill Avenue, Chino (Chino Airport)	N/A
8B, 8C	Rick Evans, The Evans Company	Commercial-retail, restaurants, fast food, gas station	13.63 acres; 106,930 sq ft shopping center, consisting of 10 separate buildings, and a tentative parcel map to subdivide the property into 7 parcels for condominium purposes.	7079 Schaefer Avenue, Chino	N/A

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
8B, 8C	Lance Watkins	Commercial	17.7 acres; RV storage facility with modular office	North side of Edison Ave., between Magnolia Ave. and Oak Ave., Chino	N/A
8B, 8C	Melissa Beeler, Parkcrest Construction, Inc.	Airport Development	3.2 acres; multi-tenant commercial building, mini-mart and gas station	Southeast corner of Euclid Ave. and Kimball Ave., Chino	N/A
8B, 8C	Ken Carrell, ARE Associates	Commercial	7.77 acres; 381-space RV storage with a 384 sq ft modular office	Northwest corner of Edison Ave. and Mountain Ave., Chino	N/A
8B, 8C	Golden Palms	Office	64,600 sq ft, two-story medical building	Southwest corner of Schaefer Ave. and Roswell Ave., Chino	Approved, Under Construction
8B, 8C	CGM Development	Mixed-use	11.5 acres; 51,143 sq ft of commercial/retail, and 107 units of senior housing	Southwest corner of Schaefer Ave. and Roswell Ave., Chino	N/A
8B, 8C	Quinn Johnson, Xebec Building Co.	Industrial	4.02 acres; two industrial buildings totaling 84,000 sq ft on two parcels	Northwest corner of Monte Vista Ave. and Schaefer Ave., Chino	N/A
8B, 8C	Quinn Johnson, Xebec Building Co.	Industrial	5.69 acres; four industrial buildings totaling 118,600 sq ft on two parcels	13501 Fifth St., Chino	N/A
CITY OF ONTARIO					
8B, 8C	New Model Colony- Countryside Specific Plan	Residential	178 acres; 819 single-family	The boundary of the New Model Colony is generally the entire city south of Riverside Drive.	Specific Plan Under Review; DEIR Available
8B, 8C	New Model Colony- Edenglen Specific Plan	Residential, Commercial	160 acres; 277 single-family units, 307 multi-family units; 20 acres of commercial		Approved
8B, 8C	New Model Colony- Parkside Specific Plan	Residential, Commercial, Open Space	249 acres; 597 single-family units, 1409 multi-family units; 15 acres of commercial; 50 acres of parks and trails		Specific Plan Under Review; EIR In Progress
8B, 8C	New Model Colony- West Haven Specific Plan	Residential, Commercial, School, Open Space	199 acres; 753 single-family units; 10 acres of commercial; elementary school, park		Specific Plan Under Review; EIR In Progress
8B, 8C	New Model Colony- Grand Park Specific Plan	Residential, Commercial, School	320 acres; 389 single-family units, 729 multi-family units; 15,000 sq ft of commercial; high school, elementary school		Specific Plan Under Review; EIR In Progress
8B, 8C	New Model Colony- Subarea 18 Specific Plan	Residential, Commercial, School	560 acres; 2,442 single-family units, 232 multi-family units; 30 acres of commercial; middle school, high school		Specific Plan Under Review; EIR In Progress
8B, 8C	New Model Colony- Subarea 29 Specific Plan	Residential, Commercial, School, Park	532 acres; 2,291 single-family units; 10 acres of commercial; elementary school, park		Specific Plan Under Review; EIR In Progress
8B, 8C	New Model Colony- Esperanza Specific Plan	Residential, School, Park	223 acres; 914 single-family units, 496 multi-family units; elementary school, park		Specific Plan Under Review; EIR In Progress
8B, 8C	New Model Colony- Armstrong Ranch Specific Plan	Residential, Commercial, School, Park	433 acres; 1,616 single-family units; 10 acres of commercial; elementary school, park		Specific Plan Under Review; EIR In Progress

Table 2.9-12. Cumulative Projects by Jurisdiction					
Seg-ment	Project Name	Project Type	Project Description/Size	Project Location	Project Status / Schedule
8B, 8C	New Model Colony- Rich-Haven Specific Plan	Residential, Commercial	510 acres; 2,109 single-family units, 1,550 multi-family units; 848,400 sq ft of commercial		Specific Plan Under Review; EIR In Progress

Source: Refer to Chapter 8 (References)

3. Affected Environment and Environmental Consequences

3.1 Introduction to the Environmental Analysis

3.1.1 Section Content and Organization

Chapter 3 of this EIR/EIS examines the environmental consequences associated with the proposed Project and alternatives to the proposed Project, including the No Project/Action alternative. Chapter 3 includes analyses of the 16 environmental resource/issue areas listed in Table 3.1-1 below.

Table 3.1-1. Topics Addressed in the Impact Analysis

Sec. No.	Issue/Resource Area	Topics Addressed in the Analysis
3.2	Agricultural Resources	• Conversion of Prime Farmland, Unique Farmland, and Farmland of Statewide Importance • Interference with agricultural operations • Conflicts with Williamson Act contracts
3.3	Air Quality	• Generation of air pollutant emissions during construction and operation • Objectionable odors • Compliance with applicable air quality management plans
3.4	Biological Resources	• Riparian habitat and other sensitive natural communities • Endangered and threatened species and critical habitat for such species • Candidate, sensitive, and special-status species • Federally protected wetlands as defined by Section 404 of the Clean Water Act • Wildlife corridors • Conflicts with any local policies or ordinances protecting biological resources • Conflicts with an adopted Habitat Conservation Plan or Natural Communities Conservation Plan
3.5	Cultural Resources	• Historic properties or Traditional Cultural Properties • Historical resources or unique archaeological sites • Cultural resources included in a local register of historical resources • Native American human remains
3.6	Environmental Contamination and Hazards	• Soil contamination, including flammable or toxic gases • Mobilization of contaminants currently existing in the soil • Exposure of workers or the public to contaminated or hazardous materials
3.7	Geology, Soils, and Paleontology	• Unique geologic features or geologic features of unusual scientific value • Known mineral and energy resources • Triggering or acceleration of geologic processes, such as landslides or soil erosion • Earthquake-related ground rupture in the vicinity of major fault crossings • Seismically induced ground shaking, landslides, liquefaction, settlement, lateral spreading, and surface cracking • Corrosive soils and other unsuitable soils • Potential for future slope failures on existing unstable slopes • Scientifically important paleontological resources
3.8	Hydrology and Water Quality	• Degradation of water quality • Depletion of groundwater supplies or interference with groundwater recharge • Flood hazards • Erosion, siltation, and flood-related damage • Inundation by mudflow
3.9	Land Use	• Preclusion of permitted land uses • Conflicts applicable federal, State or local land use plans, goals, or policies
3.10	Noise	• Temporary or periodic increases in ambient noise levels during construction • Permanent increases in ambient noise levels in the vicinity of sensitive receptors

Table 3.1-1. Topics Addressed in the Impact Analysis

Sec. No.	Issue/Resource Area	Topics Addressed in the Analysis
3.11	Public Services and Utilities	• Demand for public services • Interference with existing emergency access • Interruption of existing utility systems • Effects on water treatment, wastewater treatment, or solid waste facilities • Water entitlements and resources
3.12	Socioeconomics	• Population, housing, and employment • Quality of life • Private property values • Agricultural revenues • Public agency revenue
3.13	Traffic and Transportation	• Traffic congestion during construction due to road or lane closures • Level of service on roadways in the area • Temporary access restrictions during construction • Restriction of emergency vehicle movement during construction • Disruption of bus transit service during construction • Disruptions of rail, aviation, bicycle, or pedestrian traffic • Effects on parking supply • Roadway wear in the vicinity of the construction zone • Effects on public and private airports, air traffic, and military aviation
3.14	Visual Resources	• Existing landscape character and visual quality • Light or glare • Scenic resources within a scenic highway viewshed or a national scenic trail viewshed • Applicable plans, policies, regulations, or standards for the protection and management of visual quality in the landscape
3.15	Wilderness and Recreation	• Disruption of activities at federal, State, or local recreation areas or wilderness areas • Long-term loss or degradation of federal, State, local, or private recreational facilities or wilderness areas
3.16	Wildfire Prevention and Suppression	• Fire prevention and suppression • Wildfire risks • Ignition potential and rate of fire spread
3.17	Electrical Interference and Hazards	• Interference with radio, television, communications, or electronic equipment • Induced currents and shock hazards • Interference with cardiac pacemakers • Potential for structural failure due to wind or earthquake

The environmental issue/resource areas listed in Table 3.1-1 above are discussed in detail in Sections 3.2 through 3.17. Analysis within each resource/issue area section includes consideration of SCE's proposed Project (Alternative 2) and other alternatives, which are described fully in Chapter 2 of this EIR/EIS. Each resource/issue area section is organized in the same manner to help the reader find similar information in the various sections for each resource/issue area. The organization and content of the resource/issue area sections are described below:

Introduction

The "Introduction" describes the resource/issue area that is addressed in the section and indicates whether~~that~~ the information and analysis ~~of~~ contained in each section is derived from a corresponding Specialist Report. To support the EIR/EIS and the analysis contained in this chapter (Chapter 3), a series of Specialist Reports were prepared ~~that address each of the issue/resource areas discussed in this chapter (Chapter 3)~~ including: Air Quality; Biological Resources; Riparian Conservation Areas (to support Biological Resources); Cultural Resources; Geology, Soils, and Paleontology; Hydrology and Water Quality; and Visual Resources. The "Introduction" also lists the relevant issues raised

during the scoping process that are addressed in the resource/issue section. The "Introduction" also contains a table that summarizes ~~and~~ the impacts for each alternative for that issue/resource area.

Affected Environment

The "Affected Environment" section describes existing conditions in the Project area for each resource/issue area at the time the EIR/EIS analysis was conducted. Except where indicated differently, the affected environment generally consists of conditions that existed at the time the Notice of Preparation and Notice of Intent for the EIR/EIS were published. The impacts of the alternatives are determined based on changes between existing conditions described in the "Affected Environment" section and conditions in the future with implementation of each alternative. It is the difference between existing conditions and future conditions that forms the basis for identification of impacts associated with the implementation of each alternative. In other words, the changes in the future environment that would be caused by an alternative constitute the impacts of that alternative.

Applicable Laws, Regulations, and Standards

Laws, regulations, and standards relevant to each issue/resource area are described in order to establish the regulatory context for the impact analysis. Many existing requirements serve to avoid or minimize impacts to the environment. The analysis assumes that applicable laws, regulations, and standards will be adhered to and enforced. However, not all relevant laws and regulations are applicable to all projects. For instance, local laws are generally not applicable to projects regulated by the California Public Utilities Commission, which has exclusive authority to approve or deny projects proposed by investor-owned utilities, such as SCE. Similarly, the USDA Forest Service has exclusive authority to approve or deny projects on National Forest System lands.

Impact Analysis Approach

The "Impact Analysis Approach" section describes measures proposed by the Applicant (SCE) to reduce or avoid environmental impacts. These Applicant-proposed measures are considered part of the proposed Project and represent a commitment by the Applicant to be followed or implemented. The Lead Agencies will monitor their implementation. The "Impact Analysis Approach" section also lists the criteria that will be used to determine the significance of identified impacts, as required by CEQA (see Section 3.1.3 below). CEQA requires that the significance of individual impacts be determined by the Lead Agency; however, the use of specific significance criteria is not required by NEPA. NEPA requires that an EIS is prepared when the proposed federal action (project) as a whole has the potential to "significantly affect the quality of the human environment." Under NEPA, once the decision to prepare an EIS was made by the Forest Service, it is the magnitude of the impact that is evaluated. ~~The Forest Service must consider the context and intensity of impacts in determining their significance.~~ This section also describes any specific methods, such as modeling, that were used to conduct the impact analysis for a particular issue/resource area.

Alternative 1: No Project/Action

The analysis of the No Project/Action Alternative attempts to describe, in a general way, forecasted conditions that would exist in the future without the implementation of the proposed Project/Action. In other words, this section describes the conditions that would be expected to exist if the proposed transmission system improvements are not implemented. No Project-related impacts are described; however, any known impacts that would occur without the proposed Project are discussed.

Alternative 2: SCE's Proposed Project

This section describes the impacts of SCE's proposed Project, which is designated as Alternative 2. The first part of the impact analysis describes the direct and indirect effects of the proposed Project. The second part of the impact analysis describes cumulative effects, which are effects of the proposed Project and other projects that could combine to result in an impact that is cumulative in nature. Cumulative effects are discussed in a more general way than the Project's direct and indirect effects. The impact analysis is organized according to subheadings that correspond to the CEQA significance criteria listed in the "Impact Analysis Approach" section. For each identified impact, a numbered impact statement is presented that describes the basic nature of the impact. Each numbered impact statement is followed by a discussion that describes the impact in more detail. For each adverse impact, feasible mitigation measures are listed that would avoid or minimize the identified impact. For the purposes of CEQA, which requires a determination of the significance of each impact, a conclusion is provided regarding the significance of each impact after the effectiveness of the mitigation measures is considered.

Alternative 3: West Lancaster Alternative

This alternative is analyzed in the same manner as the proposed Project (Alternative 2), except that the impact discussion is not fully repeated if the impacts of this alternative are the same or substantially similar to those already described for the proposed Project. Instead, the previous impact discussion is referenced and any differences in the nature or severity of the impact are described, including any differences related to mitigation or impact significance. If this alternative would result in an impact not previously identified, a new impact statement is introduced, along with a corresponding impact discussion, mitigation measures, and CEQA significance conclusion.

Alternative 4: Chino Hills Route Alternatives

This alternative is analyzed in the same manner as the proposed Project (Alternative 2), except that the impact discussion is not fully repeated if the impacts of this alternative are the same or substantially similar to those already described for an alternative already discussed. Instead, the previous impact discussion is referenced and any differences in the nature or severity of the impact are described, including any differences related to mitigation or impact significance. If this alternative would result in an impact not previously identified, a new impact statement is introduced, along with a corresponding impact discussion, mitigation measures, and CEQA significance conclusion.

Alternative 5: Partial Underground Alternative

The analysis of this alternative is presented in the same manner as Alternative 4, described above.

Alternative 6: Maximum Helicopter Construction in the ANF Alternative

The analysis of this alternative is presented in the same manner as Alternative 4, described above.

Alternative 7: 66-kV Subtransmission Alternative

The analysis of this alternative is presented in the same manner as Alternative 4, described above.

Impact Significance Summary

At the end of each resource/issue area section, a table is presented that lists each impact identified for that issue/resource area. The CEQA significance conclusion for each impact for each alternative is presented in the table along with the mitigation measures proposed to address each impact.

As described above, each environmental impact identified is associated with a specific significance criterion, which is used to evaluate the severity, or significance, of the impact. Mitigation measures are proposed for adverse impacts, where feasible. Cumulative impacts are discussed at the end of each issue/resource area section in this Chapter. The growth-inducing impacts of the proposed Project are discussed in Section 5.1.4.

The purpose of identifying the potential environmental impacts and the associated mitigation measures is to provide information about the Project's environmental effects to decision makers and the public that can be used in deliberations about whether or not to approve the proposed Project or one of the alternatives. The information contained in this EIR/EIS will also be used by regulatory agencies that would need to issue permits for the construction of the Project if approved by the Lead Agency decision makers.

3.1.2 Environmental Analysis Methodology

For the purpose of this EIR/EIS document, and pursuant to CEQA Guidelines (Section 15125[a]), the environmental setting used to determine the impacts associated with the proposed Project and alternatives is based on the environmental conditions that existed in the Project area in September 2007, at the time the Notice of Preparation was distributed and the Notice of Intent was published (see Section 7.1). NEPA requires that the EIS shall succinctly describe the environment of the area(s) to be affected or created by the alternatives under consideration (40 CFR 1502.15). However, NEPA has no direct guidance regarding when the establishment of a baseline for determining the significance of an impact when preparing an EIS should occur. Therefore, this document uses the CEQA environmental setting baseline identified above.

This EIR/EIS evaluates the environmental consequences and potential impacts that would be caused by the proposed Project and the alternatives if approved and implemented. The impacts identified were compared with significance criteria and, based on these criteria, the impacts have been classified according to significance categories described in Section 3.1.3, below. A comparative analysis of the impacts of the proposed Project and the alternatives is provided in Section 4 of this EIR/EIS.

The cumulative impacts of the proposed Project and alternatives were assessed by considering similar impacts of other projects in the vicinity that would have the potential to combine with the impacts of the proposed Project. The purpose of the cumulative impact analyses is to identify those Project impacts that might not be significant when considered alone, but contribute to a significant impact when viewed in conjunction with existing or potential future projects.

Mitigation is only required for significant impacts under CEQA; however, NEPA encourages mitigation for all of the adverse impacts of a project. For this reason, some mitigation measures described in this document are wholly appropriate under NEPA, although the impacts they address may not be considered significant under CEQA. Mitigation measures have been identified that would reduce or avoid the adverse impacts identified. Where feasible, mitigation measures have been identified that would reduce significant impacts to a less-than-significant level. These mitigation measures are presented for consideration by decision makers as possible conditions of Project approval.

The Applicant has incorporated design features, measures, and procedures into the description of its proposed Project to avoid or reduce impacts from Project construction and operation. These measures are referred to as Applicant-Proposed Measures (APMs) in this EIR/EIS and are considered in the analysis of impacts and the determinations of impact significance. In the assessment of identified impacts, APMs have been assumed to be part of the proposed Project and, therefore, are not included as mitigation measures. The APMs are considered a commitment by the Applicant and implementation of each APM will be monitored by the Lead Agencies if the proposed Project or an alternative is approved. The APMs that are considered necessary to reduce potential impacts are listed in each environmental issue area discussion (Sections 3.2 through 3.17).

3.1.3 Impact Significance Categories

For the purposes of CEQA compliance, the significance of each identified impact of the proposed Project and alternatives has been determined. The CEQA Lead Agency is responsible for determining whether an impact is significant and is required to adopt feasible mitigation measures to minimize or avoid each significant impact. A series of criteria, identified in the "Impact Analysis Methodology" section for each issue/resource area, are used to help the CEQA Lead Agency gauge the significance of each impact.

In order to provide for a comprehensive and systematic evaluation of potential environmental impacts to the issue area categories, a classification system was applied to the impacts of the proposed Project and alternatives. These classifications indicate whether an identified impact is significant and whether mitigation measures can reduce the severity of the impact to a level that is not significant. The following classifications were uniformly applied to each identified impact:

- **Class I: Significant impact; cannot be mitigated to a level that is not significant.** Class I impacts are significant adverse effects that cannot be mitigated below a level of significance through the application of feasible mitigation measures. Class I impacts are significant and unavoidable.
- **Class II: Significant impact; can be mitigated to a level that is not significant.** A Class II impact is a significant adverse effect that can be reduced to a less than significant level through the application of feasible mitigation measures presented in this EIR/EIS.
- **Class III: Adverse; less than significant.** A Class III impact is a minor change or effect on the environment that does not meet or exceed the criteria established to gauge significance.
- **Class IV: Beneficial impact.** Class IV impacts represent beneficial effects that would result from project implementation.

In cases where there is a potential for a certain type of impact, but no such impact would occur for the proposed Project or an alternative, the reasons for no occurrence of an impact are described and no impact classification is assigned.

A significant impact is defined by CEQA as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (State CEQA Guidelines Section 15382). In comparison, NEPA states that "'Significantly' as used in NEPA requires considerations of both context and intensity…" (40 CFR 1508.27). Significance criteria serve as a benchmark for determining if a project action will result in a significant adverse environmental impact when evaluated against the baseline. Although guidance provided by CEQA and NEPA are used to help determine the significance of impacts, the determination of impact significance is based on the independent judgment of the Lead Agencies. The establishment of any criteria used to evaluate the significance of impacts is also the responsibility of the Lead Agencies. Criteria used to determine the significance of the proposed Project's impacts are presented in the sections addressing individual environmental issue areas (Sections 3.2 through 3.17). Some impact categories in this document lend themselves to scientific or mathematical

analysis and, therefore, to quantification, while others are more qualitative, and resources such as Air Quality have significance thresholds that are established by regulatory agencies.

Pursuant to NEPA, the intent of the environmental impact analysis is to provide a scientific and analytic basis for comparing the alternatives. The analysis also identifies any adverse environmental effects that cannot be avoided should the project be implemented and presents mitigation measures to minimize adverse environmental impacts (40 CFR 1502.16). Environmental effects include direct, indirect, and cumulative impacts.

3.1.4 Cumulative Impact Analysis

Cumulative impacts are the impacts on the environment that result from the incremental impacts of the proposed Project when considered with other past, present, and reasonably foreseeable future.

Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time." 40 CFR §1508.7. Under NEPA, both context and intensity are considered in determining significance. Among other considerations when considering intensity is "[w]hether the action is related to other actions with individually minor but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts." 40 CFR §1508.27(b)(7).

Under the State CEQA Guidelines, "a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts." 14 Cal Code Regs §15130(a)(1). An EIR must discuss cumulative impacts if the incremental effect of a project, combined with the effects of other projects is "cumulatively considerable." 14 Cal Code Regs §15130(a). Such incremental effects are to be "viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." 14 Cal Code Regs §15164(b)(1). Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis.

In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, the analysis of cumulative impacts presented for each issue area relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

The cumulative effects analyses do not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we

are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Third, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005, regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions."

The cumulative effects analysis in this EIR/EIS is also consistent with Forest Service NEPA Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part:

CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision-makers. (40 CFR 1508.7)

Past actions in the cumulative analysis area include projects such as commercial, residential, and infrastructure developments in the North and South Regions and infrastructure, fuels reduction, fire management, and recreational facility development in the Central Region as well as natural events such as fires, floods, and earthquakes. Most of these types of actions are ongoing in the analysis area, and the types of impacts associated with them are evident in current conditions and continue to occur. For these reasons, the analysis of past actions is based on current environmental conditions.

3.2 Agricultural Resources

3.2.1 Introduction

This section describes the agricultural resources that would be affected by the TRTP. The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts for a range of Project alternatives, and recommends measures to reduce or avoid adverse impacts anticipated from Project construction and operation. In addition, existing laws and regulations relevant to agricultural resources are described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Project. Agricultural resources that exist along the alternative routes include land designated as important farmland, other agricultural operations, and lands under Williamson Act contracts.

Scoping Issues Addressed

During the scoping period for the EIR/EIS (August-October 2007), a series of scoping meetings were conducted with the public and government agencies, and written comments were received by agencies and the public that identified issues and concerns (Aspen Environmental Group, 2007). No issues relevant to Agricultural Resources were raised during the scoping process.

Summary and Comparison of Alternatives

Table 3.2-1 on the following page presents some key factors related to agricultural resources for each alternative. It is important to note that the "Environmental Issues" indicated in Table 3.2-1 are not necessarily impact statements, but rather selected information items that provide a comparison between the alternatives. Specific impact statements that have been identified for the Project and alternatives, in accordance with the significance criteria introduced in Section 3.2.4.1 (Criteria for Determining Impact Significance) are described in Sections 3.2.5 through 3.2.11.

3.2.2 Affected Environment

In order to identify California's agricultural land resources, the California Department of Conservation (DOC) established the Farmland Mapping and Monitoring Program (FMMP) which applies the Natural Resources Conservation Service's (NRCS) soil classifications. Agricultural data collected by the NRCS and DOC is compiled by county. Consequently, for the purposes of this analysis, agricultural resources are analyzed by county.

The regional setting for the proposed Project and alternatives includes parts of Kern County, the ANF, Los Angeles County (incorporated and unincorporated), and San Bernardino County (incorporated and unincorporated). The Project is also located within one-half mile of Riverside County (at Mira Loma Substation) and Orange County (along the proposed ROW for Segment 8A). The FMMP important farmland data for Los Angeles, Kern, and San Bernardino Counties includes a 10-acre minimum mapping unit, which means that units of land smaller than 10 acres are incorporated into the surrounding map classifications (DOC, 2004a). Important farmland is classified as the following: Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Importance, Grazing Land, and agricultural land under Williamson Act Contract. See Section 3.2.3 for a description of these important farmland classifications.

Table 3.2-1. Summary Comparison of Environmental Issues – Agricultural Resources

Environmental Issues	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3 (West Lancaster)	Alternative 4 (Chino Hills)	Alternative 5 (Partial Underground)	Alternative 6 (Max. Heli. Construction in ANF)	Alternative 7 (66-kV Subtransmission)
Temporarily or permanently preclude the agricultural use of • Prime Farmland • Unique Farmland • Farmland of Statewide Importance	Potential projects would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and subsequently introduce similar types of impacts.	Prime: 7.98 miles Unique: 0.92 miles Statewide: 0.18 miles	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Acres of Farmland temporarily converted to non-agricultural use (Impact AG-1)	Same as above	54.75 acres	Same as Alternative 2.	~~33.07~~ 43.27 acres	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Acres of Farmland permanently converted to non-agricultural use (Impact AG-2)	Same as above	5.83 acres	Same as Alternative 2.	~~4.35~~ 5.41 acres	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 2.
Miles of agricultural land traversed by Project (Impacts AG-3, AG-4)	Same as above	75.55 miles	75.95 miles	Alt. 4A: ~~57.67~~ 77.21 miles Alt. 4B: ~~58.22~~ 79.80 miles Alt. 4C: ~~64.63~~ 84.35 miles Alt 4C Mod: 85.47 miles Alt. 4D: ~~61.23~~ 80.77 miles	74.85 miles	Same as Alternative 2.	Same as Alternative 2.

Kern, Los Angeles, and San Bernardino Counties have a combined total of approximately 3,310,000 acres of agricultural land within their jurisdictions, with the majority of this total in Kern County. Table 3.2-2 indicates the total acreage of agricultural land in Los Angeles, Kern, and San Bernardino Counties along with the acreage of important farmland in each jurisdiction. As shown in Table 3.2-2, Kern County contains approximately 676,225 acres of Farmland, while Los Angeles County contains approximately 34,658 acres of Farmland, and San Bernardino County contains approximately 30,920 acres of Farmland (DOC, 2004b; DOC, 2006b; DOC, 2006c).

Table 3.2-2. Overview of Important Farmland and Williamson Act Land in Los Angeles, Kern, and San Bernardino Counties (acres)

County	Prime Farmland	Unique Farmland	Farmland of Statewide Importance	Farmland of Local Importance	Grazing Land	Total Agricultural Land	Williamson Act Contract Land
Kern	518,804	51,095	106,326	0	911,708	1,587,933	1,649,779
Los Angeles	32,610	1,024	1,024	8,973	228,730	272,371	0
San Bernardino	17,048	3,150	7,936	2,786	902,853	933,773	9,636

DOC, 2004b; DOC, 2006b; DOC, 2006c; DOC, 2007b

3.2.2.1 Alternative 2: SCE's Proposed Project

Table 3.2-3 shows the categories of Farmland crossed by each segment of Alternative 2 along with the total distance each category of Farmland is traversed.

Table 3.2-3. Farmland Traversed by Segment

Segment	Prime Farmland	Unique Farmland	Farmland of Statewide Importance
Segment 4	4.09 miles	0.0 miles	0.0 miles
Segment 5	0.15 miles	0.0 miles	0.0 miles
Segment 6	0.0 miles	0.0 miles	0.0 miles
Segment 7	0.0 miles	0.0 miles	0.0 miles
Segment 8A	1.63 miles	0.13 miles	0.09 miles
Segment 8B	0.98 miles	0.66 miles	0.0 miles
Segment 8C	1.13 miles	0.13 miles	0.09 miles
Segment 9	0.0 miles	0.0 miles	0.0 miles
Segment 10	0.0 miles	0.0 miles	0.0 miles
Segment 11	0.0 miles	0.0 miles	0.0 miles

The only segment of Alternative 2 that traverses land under Williamson Act contracts is Segment 4, which crosses 0.91 miles of Williamson Act contract land.

The following discussion provides further detail on the agricultural resources existing along the proposed Project route and all Project components for each of the three counties.

Kern County

Project components in Kern County range from the Windhub substation in the north, through Segment 10 to Whirlwind Substation and Segment 4. Segment 4 in Kern County extends from Cottonwind Substation to MP 6.9. Table 3.2-4 lists the Farmland, grazing lands, and Williamson Act contract lands traversed by Alternative 2 in Kern County by milepost.

Table 3.2-4. Kern County Farmland, Grazing Lands, and Williamson Act Contract Lands Traversed by Alternative 2

Project Component	Type of Agricultural Resource	Williamson Act Contract
S10 MP 0.0 – 6.9	Grazing Land	No
S9 Cottonwind Substation	Grazing Land	No
S4 MP 0.0 – 1.9	Grazing Land	No
S4 MP 4.7 – 6.9	Prime Farmland	Yes

DOC, 2007b; DOC, 2007c.

Segment 10 in Kern County traverses 6.8 miles of grazing land and 10 miles of other non-Farmland agricultural lands. Segment 4 crosses 2.14 miles of Prime Farmland, 1.95 miles of grazing land, and 2.8 miles of other agricultural land. Segment 4 also crosses 0.91 miles of Prime Farmland under Williamson Act contracts. Figure 3.2-1 shows Alternative 2 in relation to agricultural resources along its routes.

Los Angeles County

Project components in Los Angeles County include Segment 4 from MP 6.9 to MP 19.6, Segment 5, Segment 11, Segment 6, Segment 7, Segment 8A from MP 0.0 to MP 20.6, Antelope, Vincent, Gould, Goodrich, Rio Hondo, and Mesa Substations. Table 3.2-5 lists the Farmland, grazing lands, and Williamson Act contract lands traversed by Alternative 2 in Los Angeles County by milepost.

Table 3.2-5. Los Angeles County Farmland, Grazing Lands, and Williamson Act Contract Lands Traversed by Alternative 2

Project Component	Type of Agricultural Resource	Williamson Act Contract
S4 MP 6.9 – 7.4	Grazing Land	No
S4 MP 7.4 – 8.7	Prime Farmland	No
S4 MP 8.7 – 9.2	Grazing Land	No
S4 MP 9.2 – 9.9	Prime Farmland	No
S4 MP 9.9 – 19.6	Grazing Land	No
S5 MP 0.0 – 2.0	Grazing Land	No
S5 MP 2.0 – 2.1	Prime Farmland	No
S5 MP 2.1 – 5.8	Grazing Land	No
S5 MP 7.4 – 8.1	Grazing Land	No
S5 MP 9.6 – 10.2	Grazing Land	No

DOC, 2007b; DOC, 2007c.

Segment 4 in Los Angeles County traverses a total of 1.95 miles of Prime Farmland, 0.05 miles of Farmland of Local Importance, and 10.75 miles of grazing land. Segment 5 crosses 0.15 miles of Prime Farmland, 4.7 miles of grazing land, and 12.9 miles of other agricultural land. Segment 6 traverses 1.42 miles of other agricultural land. Segments 7, 8A, 11 and the substations would not affect agricultural lands. No Williamson Act Lands would be affected by Alternative 2. Figures 3.2-2a and 3.2-2b show agricultural lands in Los Angeles County in the vicinity of Alternative 2. Additionally, while the ANF was not mapped under the FMMP, portions of the ANF are used for tree plantations. These plantations, however, are over 0.5 miles from the transmission line (T/L) route.

San Bernardino County

Project components in San Bernardino County include Segment 8A from MP 20.6 to MP 35.2, Chino Substation, Segment 8B from MP 0.0 to MP 6.4, Segment 8C from MP 0.0 to MP 6.4 and Mira Loma Substation. Table 3.2-6 lists the Farmland, grazing lands, and Williamson Act contract lands traversed by Alternative 2 in San Bernardino County by milepost.

Table 3.2-6. San Bernardino County Farmland, Grazing Lands, and Williamson Act Contract Lands Traversed by Alternative 2

Project Component	Type of Agricultural Resource	Williamson Act Contract
S8A MP 21.0 – 23.0	Grazing Land	No
S8A MP 28.2 – 28.7	Grazing Land	No
S8A MP 28.6 – 29.2	Prime Farmland	No
S8A MP 30.0 – 30.1	Prime Farmland	No
S8A MP 30.3 – 30.4	Prime Farmland	No
S8A MP 30.4 – 30.5	Farmland of Statewide Importance	No
S8A MP 31.0 – 31.1	Unique Farmland	No
S8A MP 31.4 – 31.5	Prime Farmland	No
S8A MP 32.0 – 32.3	Prime Farmland	No
S8A MP 32.5 – 32.8	Prime Farmland	No
S8A MP 34.6 – 35.2	Prime Farmland	No
S8C MP 0.1 – 0.7	Prime Farmland	No
S8C MP 1.6 – 1.7	Prime Farmland	No
S8C MP 1.8 – 1.9	Prime Farmland	No
S8C MP 1.9 – 2.0	Farmland of Statewide Importance	No
S8C MP 2.5 – 2.6	Unique Farmland	No
S8C MP 2.9 – 3.0	Prime Farmland	No
S8C MP 3.5 – 3.8	Prime Farmland	No
S8C MP 4.0 – 4.3	Prime Farmland	No
S8B MP 0.1 – 0.7	Prime Farmland	No
S8B MP 1.3 – 1.5	Prime Farmland	No
S8B MP 3.6 – 3.9	Prime Farmland	No
S8B MP 4.8 – 4.9	Prime Farmland	No

DOC, 2007b; DOC, 2007c.

Segment 8A traverses a total of 1.63 miles of Prime Farmland, 0.13 miles of Unique Farmland, 0.09 miles of Farmland of Statewide importance, 1.5 miles of grazing land, and 5.16 miles of other agricultural land. Segment 8B crosses 0.98 miles of Prime Farmland, 0.66 miles of Unique Farmland, and 4.52 miles of other agricultural land. Segment 8C traverses 1.13 miles of Prime Farmland, 0.13 miles of Unique Farmland, 0.09 miles of Farmland of Statewide Importance, 0.1 miles of grazing land, and 3.82 miles of other agricultural land. Figure 3.2-3 shows agricultural lands in San Bernardino County in the vicinity of Alternative 2.

3.2.2.2 Alternative 3: West Lancaster Alternative

As described in Section 2.3 (Alternative 3: West Lancaster Alternative), this alternative includes one deviation from the proposed Project route, which would extend for 3.4 miles along Segment 4, between S4 MP 14.9 and S4 17.9 in Los Angeles County. No other portion of the proposed Project route would be altered under Alternative 3. While the portion of Segment 4 that would be re-routed for Alternative 3 is situated in an area that is predominately used for agriculture, this portion is surrounded by grazing land. Consequently, the amount of grazing land traversed by Segment 4 would be increased by 0.4 miles from 10.75 miles to 11.15 miles. No other types of agricultural land would be traversed by the re-routed portion of Segment 4. With the exception of this change in the amount of grazing land traversed by the Segment 4 re-route, the Affected Environment for Alternative 3 would be the same as the Affected Environment for the proposed Project.

3.2.2.3 Alternative 4: Chino Hills Route Alternatives

Under Alternative 4, the proposed transmission line would follow the same route as the proposed Project through Kern County and northern Los Angeles County. In southern Los Angeles County, Alternative 4 would diverge from the proposed Project route at S8A MP 19.2 and turn to the southeast, crossing through part of Orange County before entering San Bernardino County. The Affected Environment of Alternative 4 is identical to the Affected Environment of the proposed Project (Section 3.2.2.1) for all Segments except Segments 8A and 8C. Alternative 4 would not include upgrades along Segment 8A from MP 19.2 to 35.2 or along Segment 8C. ~~In addition, the upgrades associated with Segments 8B and 8C would not occur; t~~Therefore, any Affected Environment characteristics associated with Agricultural Resources for these segments would not occur for Alternative 4. However upgrades, including approximately 37 new double-circuit 220-kV transmission structures, would still be required along Segment 8B as part of Alternative 4, same as Alternative 2. Although the Chino Hills Route Alternatives deviate from Segment 8A in Los Angeles County and traverse a portion of Orange County before entering San Bernardino County, this re-route would not cross any agricultural land in Los Angeles and Orange Counties.

Each of the ~~four~~ five Alternative 4 routes (Routes A through D and C Modified) would include a new 500-kV T/L and a new switching station in San Bernardino County. The switching station would be a minimum of 4 to 5 acres in size if the station uses gas-insulated technology and would be a minimum of 11 to 12 acres in size if the station uses air-insulated technology. The length of the transmission line and the location of the switching station would differ from route to route. Table 3.2-7 lists the Farmland, grazing lands, and Williamson Act contract lands traversed by each of the Alternative 4 routes in San Bernardino County ~~by milepost~~.

Table 3.2-7. San Bernardino County Farmland, Grazing Lands, and Williamson Act Contract Lands Traversed by Alternative 4

Project Component	Type of Agricultural Resource	Williamson Act Contract
Route A	Grazing Land	No
Route B	Grazing Land	No
Route C	Grazing Land	No
Route C Modified	Grazing Land	No
Route D	Grazing Land	No
S8B MP 0.1 – 0.7	Prime Farmland	No
S8B MP 1.3 – 1.5	Prime Farmland	No
S8B MP 3.6 – 3.9	Prime Farmland	No
S8B MP 4.8 – 4.9	Prime Farmland	No

DOC, 2007b; DOC, 2007c.

Route A traverses a total of 1.72 miles of grazing land and Route B traverses approximately 3.97 miles of grazing land. The 220-kV reroute of Route C traverses approximately 1.75 miles of grazing land, while the 500-kV reroute of Route C crosses approximately 1.93 miles of grazing land. The 220-kV reroute of Route C Modified traverses approximately 1.7 miles of grazing land and the 500-kV reroute of Route C Modified crosses approximately 3.1 miles of grazing land. Route D traverses approximately 4.52 miles of grazing land. No Prime Farmland, Unique Farmland, or other categorized agricultural land would be crossed by Routes A through D and C Modified. For each route, the switching station would be located on grazing land, but would not affect any Prime Farmland, Unique Farmland, Farmland of Statewide Importance or other categorized agricultural lands. Additionally, each route would traverse Segment 8B, crossing 0.98 miles of Prime Farmland, 0.66 miles of Unique Farmland, and 4.52 miles of other

agricultural land. Figure 3.2-4 shows agricultural lands in San Bernardino County in the vicinity of Alternative 4.

3.2.2.4 Alternative 5: Partial Underground Alternative

The proposed route for Alternative 5 (Partial Underground Alternative), other than going underground, would not diverge from that of the proposed Project (Alternative 2) and, therefore, the Affected Environment for Alternative 5 would be identical to the Affected Environment for the proposed Project, as described in Section 3.2.2.1.

3.2.2.5 Alternative 6: Maximum Helicopter Construction in the ANF Alternative

While the proposed route for Alternative 6 (Maximum Helicopter Construction in the ANF Alternative) would be the same as that of the proposed Project (Alternative 2), Alternative 6 would include helicopter staging and landing areas within the ANF to facilitate helicopter construction. These helicopter staging and landing areas would be located in the vicinity of the transmission line route in ANF as described for the proposed Project. Consequently, the Affected Environment for Alternative 6 would be identical to the Affected Environment for the proposed Project, as described in Section 3.2.2.1.

3.2.2.6 Alternative 7: 66-kV Subtransmission Alternative

The proposed route for Alternative 7 (66-kV Subtransmission Alternative) would be the same as that of the proposed Project (Alternative 2), although Alternative 7 would include three 66-kV subtransmission line elements in Segment 7 and the western end of Segment 8A. These elements would be located in the vicinity of the proposed Project transmission line route in Los Angeles County, although no portion of the 66-kV subtransmission lines would traverse agricultural lands. Consequently, the Affected Environment for Alternative 7 would be identical to the Affected Environment for the proposed Project, as described in Section 3.2.2.1.

3.2.3 Applicable Laws, Regulations, and Standards

3.2.3.1 Federal

Farmland Protection Policy Act (7 U.S.C. Section 4201)

The purpose of the Farmland Protection Policy Act (FPPA) is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. It additionally directs federal programs to be compatible with State and local policies for the protection of farmlands. Congress passed the Agriculture and Food Act of 1981 (Public Law 97-98) containing the FPPA—Subtitle I of Title XV, Section 1539-1549. The final rules and regulations were published in the Federal Register on June 17, 1994.

The FPPA is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. It assures that, to the extent possible, federal programs are administered to be compatible with state, local units of government, and private programs and policies to protect farmland. Federal agencies are required to develop and review their policies and procedures to implement the FPPA every two years. The FPPA does not authorize the Federal Government to regulate the use of private or nonfederal land or, in any way, affect the property rights of owners.

For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land.

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a federal agency or with assistance from a federal agency (NRCS, 2008).

3.2.3.2 State

California Department of Conservation, Division of Land Resource Protection.

The DOC applies the NRCS soil classifications to identify agricultural lands, and these agricultural designations are used in planning for the present and future of California's agricultural land resources. The DOC has a minimum mapping unit of 10 acres, with smaller than 10-acre parcels being absorbed into the surrounding classifications.

The list below provides a comprehensive description of all the categories mapped by the DOC (DOC, 2004a). Collectively, lands classified as Prime Farmland, Farmland of Statewide Importance, and Unique Farmland is referred to as Farmland (DOC, 2004a).

- **Prime Farmland.** Farmland that has 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 four 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 been cropped at some time during the four years prior to the mapping date.
- **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.
- **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. The minimum mapping unit for Grazing Land is 40 acres.
- **Urban and Built-up Land.** Land occupied by structures with a building density of at least 1 unit to 1.5 acres, or approximately 6 structures to a 10-acre parcel. This land is used for residential, industrial, commercial, institutional, public administrative purposes, railroad and other transportation yards, cemeteries, airports, golf courses, sanitary landfills, sewage treatment, water control structures, and other developed purposes.
- **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.

California Land Conservation Act

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, is promulgated in California Government Code Section 51200-51297.4, and therefore is applicable only to

specific land parcels within the State of California. The Williamson Act enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space uses in return for reduced property tax assessments. Private land within locally designated agricultural preserve areas is eligible for enrollment under Williamson Act contracts. The Williamson Act program is administered by the DOC, in conjunction with local governments, which administer the individual contract arrangements with landowners. The landowner commits the parcel to a 10-year period wherein no conversion out of agricultural use is permitted. Each year the contract automatically renews unless a notice of non-renewal or cancellation is filed. In return, the land is taxed at a rate based on the actual use of the land for agricultural purposes, as opposed to its unrestricted market value. Participation in the Williamson Act program is dependent on county adoption and implementation of the program and is voluntary for landowners (DOC, 2007a).

The Williamson Act states that a board or council by resolution shall adopt rules governing the administration of agricultural preserves. The rules of each agricultural preserve specify the uses allowed. Generally, any commercial agricultural use will be permitted within any agricultural preserve. In addition, local governments may identify compatible uses permitted with a use permit (DOC, 2006a).

The Farmland Security Zone is additional agricultural land conservation legislation that allows local governments and landowners to rescind a Williamson Act contract and simultaneously place the farmland under a Farmland Security Zone contract for an initial term of at least 20 years. A Farmland Security Zone contract offers landowners greater property tax reduction than the Williamson Act by valuing enrolled real property at 65 percent of its Williamson Act valuation, or its Proposition 13 valuation, whichever is lower (DOC, 2006a).

California Government Code Section 51238 states that unless otherwise decided by a local board or council, the erection, construction, alteration, or maintenance of electric and communication facilities, as well as other facilities, are determined to be compatible uses within any agricultural preserve. Also Section 51238 states that board of supervisors may impose conditions on lands or land uses to be placed within preserves to permit and encourage compatible uses in conformity with Section 51238.1.

Further, California Government Code Section 51238.1 allows a board or council to allow as compatible a use that without conditions or mitigations would otherwise be considered incompatible. However, this may occur only if the use meets the following conditions:

- The use will not significantly compromise the long-term productive agricultural capability of the subject contracted parcel or parcels or on other contracted lands in agricultural preserves.
- The use will not significantly displace or impair current or reasonably foreseeable agricultural operations on the subject contracted parcel or parcels or on other contracted lands in agricultural preserves. Uses that significantly displace agricultural operations on the subject contracted parcel or parcels may be deemed compatible if they relate directly to the production of commercial agricultural products on the subject contracted parcel or parcels or neighboring lands, including activities such as harvesting, processing, or shipping.
- The use will not result in the significant removal of adjacent contracted land from agricultural or open-space use.

3.2.3.3 Local

The proposed Project would cross lands within Kern County, Los Angeles County and San Bernardino County, and would come within 0.5 mile of Riverside County. A review of all agricultural resource policies that apply to the proposed Project was conducted, which includes all county and city plans, as well as applicable local area plans.

3.2.4 Impact Analysis Approach

3.2.4.1 Criteria for Determining Impact Significance

To satisfy CEQA requirements, conclusions are made regarding the significance of each identified impact that would result from the proposed Project and alternatives. Appropriate criteria have been identified and utilized to make these significance conclusions. The following agricultural resources significance criteria were derived from previous environmental impact assessments and from the CEQA Guidelines (Appendix G, Environmental Checklist Form, Section IX). Impacts of the proposed Project or alternatives would be considered significant and would require mitigation if:

- Criterion AG1: The proposed Project would convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation and the USDA Natural Resources Conservation Service, to non-agricultural use.

  The conversion of Farmland would be considered significant if greater than ten acres is converted to non-agricultural use. This threshold is used because it is the minimum acreage requirement for individual parcels able to enter into Williamson Act contracts as stated in Section 51222 of the California Government Code, and represent parcels or areas of agricultural land that are large enough to sustain agricultural uses. Ten acres is the minimum mapping unit on the DOC FMMP Important Farmland maps. The minimum mapping unit indicates the spatial scale of the maps and is the smallest unit or feature represented on the maps, with smaller than 10-acre features being absorbed into the surrounding classifications.
- Criterion AG2: The proposed Project would involve other changes in the existing environment, which, due to their location or nature, could result in interference with agricultural operations.
- Criterion AG3: The proposed Project would conflict with a Williamson Act contract.

Significance conclusions for individual impacts are not required for compliance with NEPA. Therefore, conclusions presented in the following analysis regarding the significance of identified impacts are provided for the purposes of CEQA only.

3.2.4.2 Applicant-Proposed Measures (APMs)

APMs were identified by SCE in the PEA. Table 3.2-8 presents the APMs that are relevant to the issue area of Agricultural Resources. APMs are a commitment by the Applicant (SCE) and are considered part of the proposed Project. Therefore, the following discussions of impact analysis assume that all APMs will be implemented as defined in the table. Additional mitigation measures are recommended in this section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

Table 3.2-8. Applicant-Proposed Measures – Agricultural Resources

APM AG-1	Coordinate with Landowner. Prior to construction and as a part of acquisition of new easements on agricultural lands, SCE would coordinate with agricultural landowners and identify feasible site-specific measures to minimize impacts to ongoing agricultural operations, including, but not limited to, financial consideration for crop loss. General measures that would be implemented to the extent feasible are detailed below.
APM AG-2	Locate Project Activities to Minimize Impacts to Active Agricultural Operations. For example, to the extent practical, SCE would: • Locate new towers adjacent to existing towers in order to consolidate obstructions to the movement of agricultural machinery • Locate access roads, spur roads, staging areas, and pulling/splicing locations in areas that minimize impacts to agricultural operations • Minimize removal of perennial crops

Table 3.2-8. Applicant-Proposed Measures – Agricultural Resources	
APM AG-3	Avoid Harvest Season. To the extent feasible, construction in agricultural fields would be scheduled after the end of harvest season.

3.2.4.3 Impact Assessment Methodology

The extent of the area to be analyzed for land use impacts is considered the Agricultural Resources Study Area, and has been defined by the following:

- Agricultural land uses immediately adjacent to the alternative ROWs
- Agricultural land uses located near the construction equipment/materials transportation routes
- Agricultural land uses affected by alternative construction and operation activities
- Agricultural land uses that have national, regional, or local significance and are within one mile of alternative ROWs

Sections 3.2.5 through 3.2.11, below, provide a discussion of the impacts identified for the proposed Project and alternatives. Using the criteria presented in Section 3.2.4.1 above, the significance of each impact is also identified, according to the following classifications:

- Class I: Significant impact; cannot be mitigated to a level that is less than significant.
- Class II: Significant impact; can be mitigated to a level that is less than significant.
- Class III: Adverse impact; less than significant.
- Class IV: Beneficial impact.

Detailed discussions of each impact and the specific locations where each is identified are presented in the following sections. For the analysis of the conversion of Farmland and conflicts with Williamson Act contracts, impact acreages are calculated for the proposed Project and alternatives by determining how many transmission structures and pulling and stringing sites would traverse Farmland and the length of access and spur roads that would traverse these lands. Impact acreages are calculated based on figures in Section 2.2 (Alternative 2: SCE's Proposed Project), assuming 0.92 acres of temporary disturbance per transmission structure, 0.92 acres of temporary disturbance per pulling and stringing site, 0.003 acres of permanent disturbance per transmission structure, and access and spur road widths of 14 feet which would be counted for both temporary and permanent disturbance.

3.2.5 Alternative 1: No Project/Action

Under the No Project/Action Alternative neither the proposed Project (Alternative 2) nor one of its re-routed or structurally changed alternatives (Alternatives 3 though 7) would be implemented. Consequently, associated impacts to agricultural resources would not occur. However, in the absence of either the proposed Project or one of its physical alternatives, the purpose and need for the power transmission capabilities that would be met by Alternatives 2 though 7 would not be achieved. Under this scenario, it is possible that a similar type of transmission line project would be constructed in the future to meet the power transmission needs of developing wind energy in the TWRA. Due to the location of the TWRA, and the projected need for power in the greater Los Angeles area, such a project would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and subsequently introduce similar types of impacts to agricultural resources.

Environmental conditions in the Project Area are expected to change or evolve over time and therefore, independently of the proposed Project or an alternative to the Project (including the No Project/Action Alternative), the regional setting and baseline conditions in the Project Area which are discussed in

Section 3.2.2 would not remain static. If the No Project/Action Alternative is implemented, agricultural resources within the Project Area will continue to change over time, independently of the potential impacts associated with the proposed TRTP. The following section describes how agricultural resources in the Project Area are expected to change in the future, under the No Project/Action Alternative. Because the potential impacts of the proposed Project would not occur under the No Project/Action Alternative, the significance criteria described in Section 3.2.4.1 are not used for analysis of the No Project/Action Alternative.

Under this alternative, electrical utilities would still need to accommodate the power load and upgrade existing transmission infrastructure or build new transmission. So while under the No Project/Action Alternative the proposed Project would not be constructed and the impacts associated with construction, operation, and maintenance of this Project would not occur, similar impacts would likely occur in other areas where the transmission infrastructure upgrades or new transmission would be located. Temporary or permanent conversion of Farmland to non-agricultural uses, such as roadways or tower structures, would not occur in this Project Area, but would likely occur elsewhere. Without construction, operation, or maintenance of the proposed Project, there would be no interference of agricultural operations in the vicinity of the proposed Project, but this would occur where the transmission infrastructure upgrades or new transmission would be located. The following discussion describes the effects of the No Project/Action Alternative in each of the counties affected by the proposed Project.

Kern County

As described in Section 3.2.2 the predominant existing land uses in Kern County in the vicinity of the TWRA include large expanses of undeveloped open space and agriculture. There are also several large tracts of undeveloped land which are planned for future development. Under the No Project/Action Alternative it would be expected that this region would continue to experience urban and suburban development particularly along the southern boundary of Kern County. Assuming that growth in this region continues it would be expected that agricultural lands would be converted to non-agricultural uses at a rate similar to that of development. All such development would require site-specific planning and environmental review prior to its implementation. Therefore, it is assumed that potential impacts to these agricultural resources would be identified and mitigated, as feasible and appropriate. Under this alternative, Segment 10 and the proposed Whirlwind Substation would not be constructed and, therefore, there would be no corresponding conversion of Farmland or disturbance to agricultural operations and no conflicts with Williamson Act contracts would occur. Consequently, in comparison to Alternatives 2 through 7, there would be fewer impacts to agricultural resources under the No Project/Action Alternative.

Los Angeles County

As described in Section 3.2.2 the predominant existing land uses in northern Los Angeles County include large expanses of undeveloped open space, agriculture and residential development. The Cities of Palmdale and Lancaster are both rapidly developing urban areas which include large tracts of residential development, as well as other uses such as commercial, business and industrial development. Under the No Project/Action Alternative it would be expected that this region would continue its rapid rate of urban and suburban development. Assuming that growth in this region continues, it would be expected that lands which are currently used for agricultural production would be converted to non-agricultural uses. However, as all such development would require site-specific planning (e.g., the development of a Specific Plan, Master Plan, or similar land use planning document) and environmental review prior to its

implementation, it is assumed that potential impacts to agricultural resources would be identified and mitigated, as feasible and appropriate.

Under the No Project/Action Alternative the existing Antelope-Magunden No. 1, Midway-Vincent No. 3, Antelope-Vincent and Antelope-Mesa transmission lines would continue to operate under their current conditions. Therefore, no new temporary or long-term impacts to existing and planned land uses within or adjacent to their respective ROWs would occur. However, as Segment 10 and the proposed Whirlwind Substation would not be constructed under this alternative, the No Project/Action Alternative would result in no impacts to agricultural resources. In comparison to Alternatives 2 through 7, there would be fewer impacts to agricultural resources under this alternative.

Southern Los Angeles County is characterized by mountainous regions, including the ANF, and substantial areas of urban land. Little agricultural land exists in these portions of Los Angeles County, so there is little potential for future projects in this area to result in substantial impacts to agricultural resources.

San Bernardino County

As described in Section 3.2.2 southwestern San Bernardino County includes highly productive agricultural land, but this is fragmented and interspersed with growing residential and urban development. Under the No Project/Action Alternative it would be expected that this region would continue its rapid rate of urban and suburban development. Assuming that growth in this region continues, it would be expected that lands which are currently used for agricultural production would be converted to non-agricultural uses. As all such development would require site-specific planning and environmental review prior to its implementation, it is assumed that potential impacts to agricultural resources would be identified and mitigated, as feasible and appropriate. Under this alternative Segments 8A, 8B, and 8C would not be constructed, and, therefore, there would be no corresponding conversion of Farmland or disturbance to agricultural operations. Consequently, in comparison to Alternatives 2 through 7, there would be fewer impacts to agricultural resources under the No Project/Action Alternative.

3.2.6 Alternative 2: SCE's Proposed Project

3.2.6.1 Direct and Indirect Effects Analysis

Potential impacts of Alternative 2 that could affect agricultural resources are presented in Table 3.2-9. In preparing this table, each category of agricultural resource identified in Section 3.2.2 by milepost was individually evaluated in comparison with the identified Project impacts (discussed below Table 3.2-9) to determine which of the Project impacts, if any, could occur in a way as to affect the resource. All identified agricultural resource impacts of Alternative 2 are discussed in detail following Table 3.2-9.

Table 3.2-9. Impacts Applicable to Agricultural Resources

Project Component	Type of Agricultural Resource	Potentially Applicable Impacts
Kern County		
S10 MP 0.0 – 6.9	Grazing Land	AG-3, AG-4
S9 Cottonwind Substation	Grazing Land	AG-3, AG-4
S4 MP 0.0 – 1.9	Grazing Land	AG-3, AG-4
S4 MP 4.7 – 6.9	Prime Farmland	AG-1, AG-2, AG-3, AG-4
Los Angeles County		
S4 MP 6.9 – 7.4	Grazing Land	AG-3, AG-4
S4 MP 7.4 – 8.7	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S4 MP 8.7 – 9.2	Grazing Land	AG-3, AG-4

Table 3.2-9. Impacts Applicable to Agricultural Resources

Project Component	Type of Agricultural Resource	Potentially Applicable Impacts
Kern County		
S4 MP 9.2 – 9.9	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S4 MP 9.9 – 19.6	Grazing Land	AG-3, AG-4
S5 MP 0.0 – 2.0	Grazing Land	AG-3, AG-4
S5 MP 2.0 – 2.1	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S5 MP 2.1 – 5.8	Grazing Land	AG-3, AG-4
S5 MP 7.4 – 8.1	Grazing Land	AG-3, AG-4
S5 MP 9.6 – 10.2	Grazing Land	AG-3, AG-4
San Bernardino County		
S8A MP 21.0 – 23.0	Grazing Land	AG-3, AG-4
S8A MP 28.2 – 28.7	Grazing Land	AG-3, AG-4
S8A MP 28.6 – 29.2	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8A MP 30.0 – 30.1	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8A MP 30.3 – 30.4	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8A MP 30.4 – 30.5	Farmland of Statewide Importance	AG-1, AG-2, AG-3, AG-4
S8A MP 31.0 – 31.1	Unique Farmland	AG-1, AG-2, AG-3, AG-4
S8A MP 31.4 – 31.5	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8A MP 32.0 – 32.3	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8A MP 32.5 – 32.8	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8A MP 34.6 – 35.2	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8C MP 0.1 – 0.7	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8C MP 1.6 – 1.7	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8C MP 1.8 – 1.9	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8C MP 1.9 – 2.0	Farmland of Statewide Importance	AG-1, AG-2, AG-3, AG-4
S8C MP 2.5 – 2.6	Unique Farmland	AG-1, AG-2, AG-3, AG-4
S8C MP 2.9 – 3.0	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8C MP 3.5 – 3.8	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8C MP 4.0 – 4.3	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8B MP 0.1 – 0.7	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8B MP 1.3 – 1.5	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8B MP 3.6 – 3.9	Prime Farmland	AG-1, AG-2, AG-3, AG-4
S8B MP 4.8 – 4.9	Prime Farmland	AG-1, AG-2, AG-3, AG-4

Potential impacts of Alternative 2 are described below, according to the significance criteria presented in Section 3.2.4.1.

Convert Farmland to non-agricultural use (Criterion AG1)

As described above in Section 3.2.2.1, Segments 6, 7, 10, 11 and the substations would not be located on Farmland (Prime Farmland, Unique Farmland, or Farmland of Statewide Importance). Consequently, these components of Alternative 2 would have no direct or indirect impacts on Farmland. Portions of Segments 4, 5, 8A, 8B, and 8C, however, would traverse Farmland. The impacts associated with construction, operation, and maintenance of these segments of Alternative 2 on Farmland are discussed below.

Impact AG-1: Construction activities would temporarily preclude the agricultural use of some Farmland.

Alternative 2 would be constructed across 7.98 miles of Prime Farmland, 0.92 miles of Unique Farmland, and 0.18 miles of Farmland of Statewide Importance, totaling a distance of 9.08 miles of Farmland traversed. Construction activities across these lands would include the construction and erection of 220-kV and 500-kV T/Ls, installation of structure foundations, extension of spur roads, and the

stringing of conductor and overhead groundwire. These activities would require the use of heavy equipment, such as graders, dozers, excavators, cranes, and various trucks for clearing and grading, tower assembly and erection, and stringing and pulling. In Farmland traversed by Segment 4, 24 T/L towers would be constructed, 8 stringing and pulling areas would be cleared, and approximately 2.13 miles of access and spur road would be graded. While Segment 5 would cross approximately 0.15 miles of Prime Farmland, no construction would occur within this parcel of Farmland. In Farmland crossed by Segments 8A, 8B, and 8C, 20 T/L towers would be constructed, 2 stringing and pulling areas would be cleared and approximately 0.86 miles of access and spur roads would be graded. In total, Alternative 2 would require the construction of 44 T/L towers, 10 stringing and pulling areas, and 2.99 miles of access and spur roads on Farmland.

Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 54.75 acres of Farmland to non-agricultural uses, broken down as follows.

- Construction activities and the presence of road work construction equipment could temporarily convert areas adjacent to the road, as well as the actual footprint of the access road to non-agricultural use as construction areas. As described in Section 2.2, access and spur roads would be graded to 12 feet with two feet of shoulder for a total width of 14 feet. Consequently, grading 2.99 miles of access and spur roads through Farmland would result in the disturbance of 5.07 acres of Farmland.
- Installation of T/L towers would consist of: installation of foundations, assembly of the structure sections, erection of the tower, and cleanup of the site. As described in Section 2.2, construction of T/L towers would temporarily disturb approximately 0.92 acres per tower location. With 44 T/L towers constructed on Farmland under Alternative 2, approximately 40.48 acres of Farmland would be disturbed due to these construction activities.
- Similarly, as described in Section 2.2, stringing and pulling areas would require approximately 0.92 acres temporarily disturbed per stringing and pulling site. Alternative 2 would require approximately 10 stringing and pulling sites on Farmland, resulting in another approximately 9.2 acres of Farmland disturbed.

Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners), which would require coordination with property owners of Farmland to determine construction scheduling, compensation for damages, and specifications for the restoration of disturbed land, is recommended to reduce impacts to Farmland.

Mitigation Measure for Impact AG-1

AG-1 **Coordinate construction activities with agricultural landowners.** SCE shall coordinate with property owners of Farmland (Prime Farmland, Farmland of Statewide Importance, Unique Farmland) and Williamson Act lands that will be used for construction of the Project, including access and spur roads, staging areas, and other Project-related activities. The purpose of this coordination is to establish the use of Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Williamson Act lands during construction in order to: (1) schedule construction activities at a location and time when damage to agricultural operations would be minimized , to the extent practicable; and (2) ensure that any areas damaged or disturbed by construction are restored to a condition that closely approximates conditions that existed prior to construction-related disturbance, to the extent practicable.

SCE's coordination with the agricultural landowners in the areas where Farmland or Williamson Act land will be temporarily disturbed is intended to minimize disruption to agricultural operations. This includes avoiding construction during peak planting, growing, and harvest seasons, if feasible, based on outage limitations. If damage or destruction occurs, SCE shall perform restoration activities on the disturbed area in order to return the area to a

condition that closely approximates conditions that existed prior to construction-related disturbance. This could include activities such as soil preparation, regrading, and reseeding. SCE shall document its coordination efforts with affected agricultural landowners regarding the continued use of Farmland and/or Williamson Act lands and shall submit this documentation to the CPUC at least 30 days prior to the start of any construction activities on the affected agricultural parcels.

CEQA Significance Conclusion

As the conversion of Farmland would be substantially greater than the 10-acre threshold described in the significance criteria, these impacts would be considered significant. SCE's APMs AG-1, AG-2, and AG-3 would work to site towers, roads, and pulling and splicing areas in locations that would minimize the impacts to agricultural lands, compensate agricultural operations for lost crops, and schedule work outside of harvest season. These APMs would reduce some of the effect of these impacts, but address only a portion of the impacts to Farmlands. Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) expands on SCE's APMs, clarifies timing and reporting requirements, and requires the restoration of disturbed land to pre-determined or pre-construction conditions. With the implementation of Mitigation Measure AG-1, temporary impacts to Farmland would be adverse, but would be reduced to a level that is not significant (Class II).

Impact AG-2: Operation would permanently convert Farmland to non-agricultural use.

As described above for Impact AG-1, Alternative 2 would traverse 7.98 miles of Prime Farmland, 0.92 miles of Unique Farmland, and 0.18 miles of Farmland of Statewide Importance and would include 2.99 miles of access and spur roads, 44 T/L towers, and approximately 10 stringing and pulling sites. As described in Section 2.2 (Alternative 2: SCE's Proposed Project), while the stringing and pulling sites would be restored following the completion of construction activities, tower footings and foundations and some access and spur roads would represent permanent disturbances to land uses, including Farmland.

Of the 44 T/L towers, 24 towers would be LSTs along Segment 4 and 20 towers would be a mix of LSTs and TSPs along Segments 8A, 8B, and 8C. Towers installed in the portions of Segments 8A and 8C traversing Farmland would be TSPs while towers installed in the portions of Segment 8B traversing Farmland would be LSTs. Segments 8A and 8C would include 12 TSPs on Farmland while Segment 8B would include 8 LSTs on Farmland. As described in Section 2.2 (Alternative 2: SCE's Proposed Project), a single LST would permanently convert 0.003 acres of land while a single TSP would permanently convert 0.001 acres of land. Consequently, T/L towers associated with Alternative 2 would permanently convert a total of 0.76 acres of Farmland to non-agricultural uses, broken down as follows.

- The 24 LSTs in Segment 4 would result in 0.72 acres of Farmland permanently converted to non-agricultural uses.
- The 8 LSTs in Segment 8B would result in 0.03 acres of Farmland permanently converted to non-agricultural uses.
- The 12 TSPs in Segments 8A and 8C would result in 0.01 acres of Farmland permanently converted to non-agricultural uses.

The acreage of access and spur roads permanently converting Farmland to non-agricultural uses would be the same as described for Impact AG-1. Access and spur roads traversing Farmland would be 14 feet wide and a total of 2.99 miles long, resulting in 5.07 acres of Farmland permanently converted to non-agricultural uses.

CEQA Significance Conclusion

While Alternative 2 would have a substantial area of Farmland temporarily converted to non-agricultural uses as described under Impact AG-1, only 5.83 acres of Farmland would be permanently converted to non-agricultural uses. As this total area would be less than the minimum area necessary for sustainable agriculture and less than the minimum DOC mapping unit, the permanent conversion of Farmland under Alternative 2 to non-agricultural uses would be considered adverse, but not significant (Class III).

Interfere with agricultural operations (Criterion AG2)

Impact AG-3: Construction activities would interfere with agricultural operations.

Alternative 2 would be constructed across approximately 23.69 miles of agricultural land in Kern County, approximately 31.92 miles of agricultural land in Los Angeles County, and approximately 19.94 miles of agricultural land in San Bernardino County. Construction activities across these agricultural lands would primarily consist of construction of the 220-kV and 500-kV T/Ls in Segments 4, 5, 6, 8A, 8B, and 8C, but would also include the construction of Cottonwind Substation on grazing land in Kern County and the expansion of the Antelope Substation in Los Angeles County. These construction activities could conflict with existing agricultural operations.

As described above for Impact AG-1, clearing and grading could be required to build spur roads associated with new tower structures. The presence and use of heavy equipment, including road graders, dozers, excavators, and trucks, needed to construct the new spur roads could interfere with agricultural operations by damaging crops or soil, impeding access to certain fields or plots of land, obstructing farm vehicles, or potentially disrupting drainage and irrigation systems. These events could result in the temporary reduction of agricultural productivity in the area. Similar to the construction of spur roads, the construction of the 220-kV and 500-kV T/Ls, including tower installation and wire stringing, the construction of the Cottonwind Substation, and expansion of the Antelope Substation would also interfere with agricultural operations. These interferences could result in a temporary decrease in agricultural productivity. As such, implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) is recommended to reduce construction impacts to agricultural operations.

CEQA Significance Conclusion

SCE's APMs AG-1, AG-2, and AG-3 would be implemented to site construction in locations that would minimize the impacts to agricultural lands, compensate agricultural operations for lost crops, and schedule work outside of harvest season. These APMs would reduce some of the impacts to agricultural operations, but address only a portion of the impacts. Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) expands on SCE's APMs, clarifies timing and reporting requirements, and requires the restoration of disturbed land to pre-determined or pre-construction conditions. With the implementation of Mitigation Measure AG-1, impacts to agricultural operations would be avoided and minimized such that impacts would be adverse, but would be reduced to a level that is not significant (Class II).

Impact AG-4: Operation would interfere with agricultural operations.

As presented for Impact AG-3, Alternative 2 would cross approximately 23.69 miles of agricultural land in Kern County, approximately 31.92 miles of agricultural land in Los Angeles County, and approximately 19.94 miles of agricultural land in San Bernardino County. Operation and maintenance of Alternative 2 would result in the presence of a 220-kV and 500-kV T/Ls, including tower structures and

wire, and spur roads. The presence of these roads and structures would interfere with agricultural operations along the Alternative 2 T/L route.

The presence of spur roads across agricultural operations could divide farm properties, which could create an obstacle to farming that impedes access to certain fields or plots, and creates irregularly shaped fields in which it would be difficult to maneuver farm equipment. New roadways could also disrupt drainage and irrigation systems, affect the efficacy of windbreaks, fragment farms, and allow for the introduction of invasive weeds within and around disturbed areas. These interferences could also permanently decrease the agricultural productivity of agricultural operations. Similar to the presence of new spur roads, the 220-kV and 500-kV T/Ls, Whirlwind Substation, and the Antelope Substation expansion could also interfere with agricultural operations, and could permanently decrease agricultural productivity. As such, implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) is recommended to reduce operational impacts to agricultural operations.

CEQA Significance Conclusion

SCE's APMs AG-1 and AG-2 would be implemented to site roads and structures in locations that would minimize the impacts to agricultural operations and compensate agricultural operations for lost crops. These APMs would reduce some of the impacts to agricultural operations, but address only a portion of the impacts. Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) expands on SCE's APMs, clarifies timing and reporting requirements, and requires the restoration of disturbed land to pre-determined or pre-construction conditions. With the implementation of Mitigation Measure AG-1, long-term impacts to agricultural operations would be avoided and minimized such that impacts would be adverse, but would be reduced to a level that is not significant (Class II).

Conflict with Williamson Act contract lands (Criterion AG3)

Segment 4 of Alternative 2 would cross 0.91 miles of land under Williamson Act contract in Kern County. This would be the only portion of the alternative to traverse or run adjacent to Williamson Act contract land. Construction activities across this land would include the construction and erection of a 500-kV T/L energized at 220 kV, installation of structure foundations, extension of spur roads, and the stringing of conductor and overhead groundwire. Similar to the construction described for Impact AG-1, construction in this area would require the use of graders, dozers, excavators, cranes, and various trucks for clearing and grading, tower assembly and erection, and stringing and pulling. In the 0.91 miles of Williamson Act contract land traversed by Segment 4, 11 T/L towers would be constructed, 1 stringing and pulling area would be cleared, and approximately 1.05 miles of access and spur road would be graded.

Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 12.82 acres of land under Williamson Act contracts to non-agricultural uses, broken down as follows.

- As described above for Impact AG-1, construction activities and the presence of road work construction equipment could temporarily convert areas adjacent to the road, as well as the actual footprint of the access road to non-agricultural use as construction areas. Grading 1.05 miles of access and spur roads through land under Williamson Act contract would result in the disturbance of 1.78 acres.
- Installation of T/L towers would be the same as described for Impact AG-1 and would consist of: installation of foundations, assembly of the structure sections, erection of the tower, and cleanup of the site. With 11 T/L towers constructed on land under Williamson Act contract under Alternative 2, approximately 10.12 acres of this land would be disturbed due to these construction activities.

- Similarly, as described for Impact AG-1, stringing and pulling areas would require approximately 0.92 acres temporarily disturbed per stringing and pulling site. With only 1 stringing and pulling site on Williamson Act contract land, another approximately 0.92 acres of Williamson Act contract land would be disturbed.

While the stringing and pulling site would be restored following the completion of construction activities, tower footings and foundations and access and spur roads would represent permanent disturbances to lands under Williamson Act contract. All of the T/L towers installed in Segment 4 would be LSTs, and so would permanently convert 0.003 acres of land per LST. Consequently, the 11 T/L towers installed on land under Williamson Act contract would permanently convert a total of 0.033 acres to non-agricultural uses. The acreage of access and spur roads permanently converting land under Williamson Act contracts to non-agricultural uses would be the same as described for temporary impacts. Access and spur roads traversing Farmland would be 14 feet wide and a total of 1.05 miles long, resulting in 1.78 acres of Williamson Act contract lands permanently converted to non-agricultural uses.

Although Alternative 2 would result in both temporary and permanent conversion of lands under Williamson Act contracts, because the Project is an electrical infrastructure project licensed by the CPUC, Kern County considers these components to be allowable uses under Williamson Act contracts (Kern County Planning Department, 2007). Consequently, there would be no conflict with Williamson Act contracts.

3.2.6.2 Cumulative Effects Analysis

Geographic Extent

Although the data on Farmland and lands under Williamson Act contract are collected and analyzed by county, because of the large geographic extent of the counties affected by the Project and limited geographic scope of agricultural impacts associated with the Project, analysis of the cumulative impact of the Project at a county-wide level would not yield valuable results. Consequently, the geographic scope of this cumulative effects analysis is limited to the area in the vicinity of the Project, a corridor of approximately 2 miles on either side of the Project in southern Kern County, eastern Los Angeles County, and southwestern San Bernardino County.

Existing Cumulative Conditions

Existing cumulative conditions for agricultural resources are defined by past and present use and conversion of agricultural lands.

Kern County. The portion of Kern County in the vicinity of Alternative 2 is largely characterized by open space and agricultural areas. While in more urban parts of Kern County, such as Bakersfield and Rosedale, agricultural lands are being converted for residential development, in the rural area around Alternative 2, conversion of irrigated Farmland is usually a result of taking it out of production to allow for grazing.

Los Angeles County. The northern portion of Alternative 2 from Kern County to the ANF is characterized by open space and agricultural areas, although the Cities of Lancaster and Palmdale are experiencing growth that is driving the expansion of residential development into open spaces, such as with the Ritter Ranch, Ana Verde, and Agua Dulce Residential Project (TR 50385). While little irrigated Farmland has been converted for residential development, as in Kern County, this land is being taken out of production for use as grazing land.

While some agricultural production occurs within the central portion of Alternative 2 in the ANF, this is characterized by tree plantations rather than by irrigated agricultural lands. These plantations are not threatened by development, but rather by fire, insects, and disease. Consequently, these plantations receive fuel management and vegetation management treatments to ensure the continued health of the plantations with projects such as the Silvicultural Treatments in Plantations for Forest Health CE as listed in the Cumulative Scenario.

Little agricultural land remains in southern Los Angeles County, particularly in the vicinity of Alternative 2. Residential development continues to expand in open space areas. While there are a large number of projects in southern Los Angeles County under the cumulative scenario, because of the lack of agricultural land in this area, there are few agricultural resources to be affected.

San Bernardino County. Southwestern San Bernardino County in the vicinity of Alternative 2 is a patchwork of residential, industrial, and agricultural areas. Farmland and agricultural lands around the Cities of Ontario, Chino, and Chino Hills have and continue to face conversion to residential and other urban development. As in both Kern and Los Angeles Counties, some Farmland is being converted for residential use, but the largest proportion is taken out of production to be used for grazing.

Reasonably Foreseeable Future Projects and Changes

As discussed above, ongoing development throughout the cumulative effects area for agricultural resources is dominated by the conversion of Farmland to grazing land, and grazing land to residential developments, clustered in and around community developments on non-NFS lands. This trend in residential development is also representative of reasonably foreseeable future projects in the cumulative effects area, as supported by the aggressive population growth forecasted throughout the Project Area. Due to the relatively limited extent of agricultural resources compared to the total area traversed by Alternative 2, a list approach is used to identify foreseeable projects in the vicinity of agricultural resources affected by Alternative 2. Reasonably foreseeable future projects within the Project Area are expected to be characteristic of past and ongoing projects.

Kern County. Kern County is currently undergoing rapid population growth and development, particularly in and surrounding Bakersfield and Rosedale. The Cumulative Scenario states that the population in Kern County is expected to rise by 113 percent between the years 2000 and 2050. Residential development is also increasing and some developments, such as the Christine Bower property and the Frazier Park Estate listed in the Cumulative Scenario, are encroaching on agricultural lands. Additionally, the Kern County 2004 General Plan calls for full realization of the County's wind energy generation capacity, including land-intensive projects such as the PdV/Manzana Wind Energy Project, Alta Wind Energy Center, and Pine Tree Wind Development, which, while spanning thousands of acres of property would convert only a small percentage of agricultural lands to non-agricultural uses.

Los Angeles County. The population in Los Angeles County is expected to rise by varying degrees, depending on the city, with the Cities of Lancaster and Palmdale experiencing growth of 117.5 percent and 186.5 percent, respectively. As such, development and urbanization in Los Angeles County is expected to continue and increase substantially to accommodate the increasing population. Accommodation of this population growth requires infrastructure projects such as the Antelope Transmission Project Segments 1-3, the Antelope Valley Water Bank Project, the California High Speed Rail, and the Orangeline High Speed Maglev Project, all of which are in the vicinity of agricultural lands. As with Kern County, Farmland is typically taken out of production and converted to grazing land which is then later converted for residential development.

While fuel and vegetation management treatments are being performed on plantations within the ANF, it is foreseeable that projects such as the Silvicultural Treatments in Plantations for Forest Health CE will continue on a regular basis to ensure the continued health of the plantations. It is anticipated that these areas would continue to be protected from development and that plantations could potentially be expanded within ANF.

In southern Los Angeles County, no agricultural resources in the vicinity of Alternative 2 were identified that would be affected by proposed projects such as those listed in the Cumulative Scenario.

San Bernardino County. As shown in the Cumulative Scenario, growth in San Bernardino County is also expected to rise by different amounts, but in the Cities of Chino and Chino Hills, growth is expected to be between 26.7 percent and 69.3 percent, respectively. Similar to Los Angeles County, development and infrastructure are expected to accommodate this increasing population. As with Kern and Los Angeles Counties, relatively little Farmland is being converted directly to residential or urban uses, but instead is converted to grazing land which is later converted to these uses. Projects such as the Western Hills by Meritage Homes, Vellano, Woodview Terrace, and PD 9-163, as described in the Cumulative Scenario, are located on or adjacent to agricultural lands and could potentially affect agricultural resources.

Cumulative Impact Analysis

Impacts AG-1, AG-3, and AG-4, as described and analyzed for Alternative 2, would combine with the similar effects of other projects ~~to be cumulatively considerable~~. In the case of Impact AG-2, the area of land that would be permanently converted for the use of Alternative 2 following site restoration and Project completion would be under the ten acre minimum mapping unit (5.83 acres of Farmland and 1.83 acres of land under Williamson Act contract) resulting in a less than significant impact for the Project. However, this conversion would have the potential to combine with similar impacts of other projects and therefore would be considered cumulative in nature~~ly considerable~~.

The potential for ~~cumulatively considerable~~ Agricultural Resources impacts of the proposed Project to combine with similar impacts of other projects within the geographic scope of the cumulative analysis is described below.

- **Construction activities would temporarily preclude the agricultural use of some Farmland (Impact AG-1).** Alternative 2 would result in the temporary conversion of 54.75 acres of Farmland due to construction activities across Segments 4 and 8 (Impact AG-1). In these areas, construction of residential and urban development projects, such as the Christine Bower property and the Frazier Park Estate in Kern County and the Western Hills by Meritage Homes, Vellano, Woodview Terrace, and PD 9-163 projects in San Bernardino County would result in substantial areas of Farmland converted to non-agricultural uses. The effects of the construction of these other planned projects would be cumulatively significant. The following mitigation measure would be implemented for Alternative 2 and would help to reduce the Project's incremental contribution to the cumulative significance of Impact AG-1: Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). However, despite implementation of this mitigation measure for the Project, Impact AG-1 would have the potential to combine with other, similar impacts of other projects and as such, Impact AG-1 would be cumulatively significant and unavoidable (Class I).
- **Construction activities would interfere with agricultural operations (Impact AG-3).** Alternative 2 would traverse 75.55 miles of agricultural land across Segments 4, 5, 6, and 8 and construction activities across these lands would interfere with agricultural operations in these areas (Impact AG-3). Construction of residential and urban projects like the Christine Bower property, Frazier Park Estate, Western Hills by Meritage Homes, Vellano, Woodview Terrace, and PD 9-163 projects and infrastructure projects such as the Antelope Transmission Project Segments 1-3, Antelope Valley Water Bank Project, California High Speed Rail, and Orangeline High Speed Maglev Project would disrupt agricultural operations both through the

disruption of agricultural land as well as through construction activities on and adjacent to agricultural lands. The effects of the construction of these other planned projects on agricultural operations would be cumulatively significant. The following mitigation measure would be implemented for Alternative 2 and would help to reduce the Project's incremental contribution to the cumulative significance of Impact AG-3: Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). However, despite implementation of this mitigation measure for the Project, Impact AG-3 would have the potential to combine with other, similar impacts of other projects and as such, Impact AG-3 would be cumulatively significant and unavoidable (Class I).

- **Operation would interfere with agricultural operations (Impact AG-4).** The operation of Alternative 2 across 75.55 miles of agricultural land would interfere with agricultural operations by dividing farm properties, creating irregularly shaped fields, disrupting drainage and irrigation systems, affecting the efficacy of windbreaks, fragmenting farms, and allowing for the introduction of invasive weeds within and around disturbed areas (Impact AG-4). The residential, urban, and infrastructure projects listed above for Impact AG-3 would also result in these similar impacts, although on a larger scale, and cumulatively interfere with a substantial number of agricultural operations. The effects of the operation of these other planned projects on agricultural operations would be cumulatively significant. The following mitigation measure would be implemented for Alternative 2 and would help to reduce the Project's incremental contribution to the cumulative significance of Impact AG-4: Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). However, despite implementation of this mitigation measure for the Project, Impact AG-4 would have the potential to combine with other, similar impacts of other projects and as such, Impact AG-4 would be cumulatively significant and unavoidable (Class I).

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation introduced for the proposed Project in Section 3.2.6.1 would help to reduce the proposed Project's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to be less than significant for agricultural resources.

3.2.7 Alternative 3: West Lancaster Alternative

3.2.7.1 Direct and Indirect Effects Analysis

The significance criteria used to identify impacts to agricultural resources are introduced in Section 3.2.4.1. Impacts associated with Alternative 3 are presented below under the applicable significance criterion.

Convert Farmland to non-agricultural use (Criterion AG1)

Impacts associated with the conversion of Farmland to non-agricultural uses (Criterion AG1) for Alternative 3 would be the same as impacts associated with this criterion for Alternative 2. Although this alternative introduces a re-route of part of the proposed transmission line in northern Los Angeles County, the re-route would not cross any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. Therefore, the impacts of Alternative 3 on Farmland would be the same as Alternative 2. Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 54.75 acres of Farmland to non-agricultural uses (Impact AG-1). While SCE's APMs AG-1, AG-2, and AG-3 would work to reduce some of the effect of these impacts, they address only a portion of the impacts to Farmlands. As the conversion of Farmland would be greater than the 10-acre threshold described in the significance criteria, these impacts would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Operation and maintenance of the T/Ls and access and spur roads would permanently convert 5.83 acres of Farmland to

non-agricultural uses (Impact AG-2). As this total area would be less than the minimum area necessary for sustainable agriculture and less than the minimum DOC mapping unit, the permanent conversion of Farmland to non-agricultural uses would be considered adverse, but not significant (Class III).

Interfere with agricultural operations (Criterion AG2)

The impacts associated with the interference with agricultural operations (Criterion AG2) would be similar to those described for Alternative 2, but as the Alternative 3 re-route would traverse an additional 0.4 miles of grazing land than Alternative 2, impacts to grazing land would be slightly greater. All other impacts would be the same as described for Alternative 2. The presence and use of heavy equipment, including road graders, dozers, excavators, and trucks, needed to construct the new spur roads could interfere with agricultural operations by damaging crops or soil, impeding access to certain fields or plots of land, obstructing farm vehicles, or potentially disrupting drainage and irrigation systems (Impact AG-3). These events could result in the temporary reduction of agricultural productivity in the area. While SCE's APMs AG-1, AG-2, and AG-3 would reduce some of the effect of these impacts, they address only a portion of the impacts on agricultural operations. Construction activities' interference with agricultural operations would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Similarly, the presence of new roads, tower structures, and wire used for the operation and maintenance of Alternative 3 would also interfere with agricultural operations (Impact AG-4). As with the temporary impacts, SCE's APMs AG-1 and AG-2 would reduce some of these impacts, but implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) would be necessary to ensure that the significant impact (Class II), would be mitigated to be less than significant.

Conflict with Williamson Act contract lands (Criterion AG3)

Impacts associated with conflicts with Williamson Act contract lands (Criterion AG3) for Alternative 3 would be the same as impacts associated with this criterion for Alternative 2. Although this alternative introduces a re-route of part of the proposed transmission line in northern Los Angeles County, the re-route would not cross any lands under Williamson Act contract. Therefore, the impacts of Alternative 3 on Farmland would be the same as Alternative 2. Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 12.82 acres of land under Williamson Act contracts, and operation and maintenance would permanently convert 1.81 acres of land under Williamson Act contracts to non-agricultural uses. As the Project is infrastructure licensed by the CPUC, however, Alternative 3 would be considered an allowable use. Consequently, the alternative would not conflict with any Williamson Act contracts and no impact would occur.

3.2.7.2 Cumulative Effects Analysis

As discussed in Section 3.2.2.2, the rerouted portion of Alternative 3 traverses the same or similar land uses as the portion of the proposed Project route it is proposed to replace, would require the same types of construction activities to build, and would result in the same operational capacity as the proposed Project. Based on the substantial similarity of Alternative 3 to the proposed Project, this alternative's contribution to cumulative impacts would be identical to that of the proposed Project.

Geographic Extent

Alternative 3 only differs from the proposed Project for a very small portion of the proposed route in the City of Lancaster, near Antelope Substation. This area is still encompassed by the geographic extent of the cumulative analysis defined for Alternative 2 in Section 3.2.6.2. Therefore, the geographic extent of the cumulative analysis for Alternative 3 is exactly the same as that for Alternative 2 and would include lands within 2 miles of the proposed Project in southern Kern County, eastern Los Angeles County, and southwestern San Bernardino County.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 3 are exactly the same as for Alternative 2, as described in Section 3.2.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 3 would be exactly the same as Alternative 2, described in Section 3.2.6.2.

Cumulative Impact Analysis

The minor re-route of the proposed Project transmission line associated with Alternative 3 would only slightly affect the proposed Project's contribution to cumulative impacts and therefore, cumulative impacts of Alternative 3 would be exactly the same as cumulative impacts for Alternative 2, as described below.

The following impact would not be cumulatively considerable: Impact AG-2 (Operation would permanently convert Farmland to non-agricultural uses). The following impacts would be cumulatively considerable and would combine with similar impacts of other projects to result in impacts that would be significant and unavoidable: Impact AG-1 (Construction activities would temporarily convert Farmland to non-agricultural use), Impact AG-3 (Construction activities would interfere with agricultural operations), and Impact AG-4 (Operation would interfere with agricultural operations).

As the cumulative effects of Alternative 3 would be the same as for the proposed Project, please see Section 3.2.6.2 for a full description of these effects.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 3 in Section 3.2.7.1 would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level for agricultural resources.

3.2.8 Alternative 4: Chino Hills Route Alternatives

3.2.8.1 Direct and Indirect Effects Analysis

The significance criteria used to identify the agricultural resource impacts of Alternative 4 are introduced in Section 3.2.4.1. As described in Section 3.2.2.3, this alternative would follow the same route as the proposed Project through the Kern and northern Los Angeles Counties, diverging from the proposed Project route along Segment 8A in southern Los Angeles County at Segment 8A MP 19.2, but would be the same as the proposed Project along Segment 8B. Therefore, any impacts of the proposed Project that would occur between Segment 8A MP 19.2 and 35.2 (16 miles) through Chino Hills, Chino, and Ontario would not occur under Alternative 4. In addition, impacts associated with Segments 8B and 8C of the

proposed Project also would not occur under Alternative 4. When the proposed route for Alternative 4 diverges from the proposed Project route at Segment 8A MP 19.2, it would turn to the southeast, crossing through part of Orange County, San Bernardino County, and the Chino Hills State Park (CHSP). Therefore, Alternative 4 would introduce agricultural resource impacts to these areas which would not be introduced through the proposed Project.

Convert Farmland to non-agricultural use (Criterion AG1)

Impacts associated with the conversion of Farmland to non-agricultural uses (Criterion AG1) for Alternative 4 would be similar to the impacts associated with this criterion for Alternative 2, although the impacts to Farmland along a portion of Segments 8A (S8A MP 19.2 to 35.2) ~~, 8B,~~ and along Segment 8C would be absent in Alternative 4. The re-routed portions of Routes A, B, C, C Modified, and D would traverse grazing land, but would not cross any Farmland so impacts would be the same for each of these routes. Consequently, the impacts of Alternative 4 on Farmland would be the same as the impacts on Segments 4, ~~and~~ 5, and 8B under Alternative 2. In Farmland traversed by Segments 4, ~~and~~ 5, and 8B, ~~24~~ 32 T/L towers would be constructed, ~~8~~ 10 stringing and pulling areas would be cleared, and approximately 2.73~~13~~ miles of access and spur road would be graded. Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately ~~33.07~~ 43.27 acres of Farmland to non-agricultural uses (Impact AG-1). While SCE's APMs AG-1, AG-2, and AG-3 would work to reduce some of the effect of these impacts, they address only a portion of the impacts to Farmland. As the conversion of Farmland would be greater than the 10-acre threshold described in the significance criteria, these impacts would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Operation and maintenance of the T/Ls and access and spur roads would permanently convert ~~4.35~~ 5.41 acres of Farmland to non-agricultural uses (Impact AG-2). As this total area would be less than the minimum area necessary for sustainable agriculture and less than the minimum DOC mapping unit, the permanent conversion of Farmland to non-agricultural uses would be considered adverse, but not significant (Class III).

Interfere with agricultural operations (Criterion AG2)

Interference with agricultural operations resulting from construction activities or from operation and maintenance of Alternative 4 would be similar to Alternative 2, ~~but instead of~~including traversing 19.94 miles of agricultural land under Segments 8A~~,~~ and 8B, ~~and 8C,~~ although Alternative 4 would ~~instead~~ also cross grazing land as shown below for each re-route:

- Route A – 1.66 miles of grazing land
- Route B – 4.25 miles of grazing land
- Route C – 8.8 miles of grazing land
- Route C Modified – 9.92 miles of grazing land
- Route D – 5.22 miles of grazing land

Additionally, each of these routes would affect between 4 and 12 acres of grazing land for installation and use of the switching station.

All other impacts would be the same as described for Alternative 2. The presence and use of heavy equipment, including road graders, dozers, excavators, and trucks, needed to construct the new spur roads could interfere with agricultural operations by damaging crops or soil, impeding access to certain fields or plots of land, obstructing farm vehicles, or potentially disrupting drainage and irrigation systems

(Impact AG-3). Interference of agricultural operations associated with construction could result in a temporary decrease in agricultural productivity. While SCE's APMs AG-1 and AG-2 would reduce some of the effect of these impacts, they address only a portion of the impacts on agricultural operations. While there would be some difference in the amount of agricultural operations disrupted by construction between the Alternative 4 routes, each route would be subject to interference that would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Similarly, the presence of new roads, tower structures, and wire used for the operation and maintenance of Alternative 4 would also interfere with agricultural operations (Impact AG-4). As with the temporary impacts, SCE's APMs AG-1 and AG-2 would reduce some of these impacts, but implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) would be necessary to ensure that the significant impact (Class II), would be mitigated to be less than significant. For both Impact AG-3 and Impact AG-4, Route A would result in the least agricultural land disrupted, Route B would have the next most agricultural land disrupted, Route D would have the second-most agricultural land disrupted, Route C would have the next-most agricultural land disrupted, and Route C Modified would have the most agricultural land disrupted.

Conflict with Williamson Act contract lands (Criterion AG3)

Under Alternative 4, Segments 8A~~, 8B,~~ and 8C would be replaced with one of Routes A, B, C, C Modified, or D (Segment 8B is common to Alternatives 2 and 4). No lands under Williamson Act contract exist along Segments 8A, 8B, 8C, or Routes A through D and C Modified. Consequently, the impacts associated with Williamson Act contract conflicts (Criterion AG3) for Alternative 4 would be the same as for Alternative 2. Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 12.82 acres of land under Williamson Act contracts, and operation and maintenance activities would permanently convert 1.81 acres of land under Williamson Act contracts to non-agricultural uses. As the Project is infrastructure licensed by the CPUC, however, Alternative 4 would be considered an allowable use. Consequently, the alternative would not conflict with any Williamson Act contracts and no impact would occur.

3.2.8.2 Cumulative Effects Analysis

The route for Alternative 4 would be exactly the same as that of the proposed Project for all segments except Segment 8, where the Alternative 4 routing options (Routes A through D and C Modified) would diverge from the proposed Project alignment at S8A MP 19.2, eliminating Segments 8A and 8C. Upgrades along Segment 8B would still be required as part of Alternative 4, same as Alternative 2. Furthermore, Alternative 4 would require the same types of construction activities to build, and would result in the same operational capacity as the proposed Project. Based on the substantial similarity of Alternative 4 to the proposed Project, this alternative's contribution to cumulative impacts would be similar or identical to that of the proposed Project. However, when compared to the proposed Project, each alternative's contribution to the amount of Farmland converted or to the miles of agricultural land traversed may be incrementally increased or decreased as a result of the rerouted portion of the alternative. With regards to Alternative 4, any incremental increases or decreases in the Project's contribution to the cumulative scenario would result from the location of the alternative alignments associated with Routes A, B, C, C Modified, and D.

Geographic Extent

Alternative 4 only differs from the proposed Project for a portion of the proposed route in southern Los Angeles and San Bernardino Counties. This area is primarily still encompassed by the geographic extent of the cumulative analysis defined for Alternative 2 in Section 3.2.6.2, but also includes a small portion of northeastern Orange County. Therefore, the geographic extent of the cumulative analysis for Alternative 4 is largely the same as that for Alternative 2 and would include lands within 2 miles of the proposed Project in southern Kern County, and eastern Los Angeles County, but would follow a different corridor in northeastern Orange and southwestern San Bernardino Counties.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 4 are exactly the same as for Alternative 2, as described in Section 3.2.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 4 would be exactly the same as Alternative 2, described in Section 3.2.6.2.

Cumulative Impact Analysis

The proposed re-route options of Alternative 4 would have the potential to incrementally increase or decrease the contribution of Alternative 2 to cumulative impacts because they would have the potential to affect agricultural resources that would not be affected by Alternative 2, and they would likewise avoid effects to some agricultural resources that would be impacted by Alternative 2. The analysis of the Alternative 4 routing options provided in Section 3.2.8.1 indicates that there would be some location-specific differences between Alternative 2 and Alternative 4 limited to a portion of southeastern Los Angeles County and southwestern San Bernardino County. Across the entirety of the rest of the proposed routes, the nature of impacts that would occur is the same between Alternative 2 and Alternative 4. As such, the contribution of Alternative 4 to cumulative impacts would be largely the same as the contribution of Alternative 2, as summarized below.

The following impact would not be cumulatively considerable: Impact AG-2 (Operation would permanently convert Farmland to non-agricultural uses). The following impacts would be cumulatively considerable and would combine with similar impacts of other projects to result in impacts that would be significant and unavoidable: Impact AG-1 (Construction activities would temporarily convert Farmland to non-agricultural use), Impact AG-3 (Construction activities would interfere with agricultural operations), and Impact AG-4 (Operation would interfere with agricultural operations).

As the cumulative effects of Alternative 4 would be the same as for the proposed Project, please see Section 3.2.6.2 for a full description of these effects.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 4 in Section 3.2.8.1 would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level for agricultural resources.

3.2.9 Alternative 5: Partial Underground Alternative

3.2.9.1 Direct and Indirect Effects Analysis

The significance criteria used to identify the agricultural resource impacts of Alternative 5 are introduced in Section 3.2.4.1. As described in Section 3.2.2.4, this alternative would follow the same route as the proposed Project through the Kern and northern Los Angeles Counties, diverging from the proposed Project route along Segment 8A in southern Los Angeles County at Segment 8A MP 21.9, but roughly following the existing ROW to Segment 8A MP 25.4. Therefore, any impacts of the proposed Project that would occur up to Segment 8A MP 21.9 and from Segment 8A MP 25.4 to S8A MP 35.2 through Chino Hills, Chino, and Ontario would be the same as described for the proposed Project. Under Alternative 5, only the construction of the Western Transition Station would occur on agricultural lands. Installation and operation of the ventilation shafts and Eastern Transition Station would occur on non-agricultural lands. By routing the transmission line underground, with the exception of construction, operation, and maintenance of the Western Transition Station, other impacts to agricultural resources between S8A MP 21.9 and S8A MP 25.4 would be eliminated.

Convert Farmland to non-agricultural use (Criterion AG1)

With the exception of the portion of the route between S8A MP 21.9 and S8A MP 25.4, construction, operation, and maintenance of the alternative would be the same as described for Alternative 2 (proposed Project). Additionally, while construction and operation of the Western Transition Station would occur on grazing land, this land is not considered Farmland and no Farmland occurs between S8A MP 21.9 and S8A MP 25.4. Similar to Alternative 2, construction, operation, and maintenance of Alternative 5 would not convert any Farmland to non-agricultural use between S8A MP 21.9 and S8A MP 25.4. As such, the impacts of Alternative 5 on Farmland would be the same as Alternative 2. Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 54.75 acres of Farmland to non-agricultural uses (Impact AG-1). While SCE's APMs AG-1, AG-2, and AG-3 would work to reduce some of the effect of these impacts, they address only a portion of the impacts to Farmland. As the conversion of Farmland would be greater than the 10-acre threshold described in the significance criteria, these impacts would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Operation and maintenance of the T/Ls and access and spur roads would permanently convert 5.83 acres of Farmland to non-agricultural uses (Impact AG-2). As this total area would be less than the minimum area necessary for sustainable agriculture and less than the minimum DOC mapping unit, the permanent conversion of Farmland to non-agricultural uses would be considered adverse, but not significant (Class III).

Interfere with agricultural operations (Criterion AG2)

Interference with agricultural operations resulting from construction activities or from operation of Alternative 5 would be similar to Alternative 2, but instead of traversing 19.94 miles of agricultural land under Segment 8A, Alternative 5 would instead cross approximately 19.04 miles of agricultural land. Additionally, boring at the Western Transition Station would affect approximately 1.84 acres of grazing land for installation and use of the station.

All other impacts would be the same as described for Alternative 2. The presence and use of heavy equipment, including road graders, dozers, excavators, and trucks, needed to construct the new spur roads could interfere with agricultural operations by damaging crops or soil, impeding access to certain

fields or plots of land, obstructing farm vehicles, or potentially disrupting drainage and irrigation systems (Impact AG-3). Interference of agricultural operations associated with construction could result in a temporary decrease in agricultural productivity. While SCE's APMs AG-1 and AG-2 would reduce some of the effect of these impacts, they address only a portion of the impacts on agricultural operations. Consequently, Alternative 5 would be subject to interference that would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Similarly, the presence of new roads and structures used for the operation of Alternative 5 would also interfere with agricultural operations (Impact AG-4). As with the temporary impacts, SCE's APMs AG-1 and AG-2 would reduce some of these impacts, but implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) would be necessary to ensure that the significant impact (Class II) would be mitigated to be less than significant.

Conflict with Williamson Act contract lands (Criterion AG3)

Under Alternative 5, Segment 8A from MP 21.9 to MP 25.4 would be replaced with an underground route. No lands under Williamson Act contract exist along Segment 8A. Consequently, the impacts associated with Williamson Act contract conflicts (Criterion AG3) for Alternative 5 would be the same as for Alternative 2. Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 12.82 acres of land under Williamson Act contracts, and operation and maintenance activities would permanently convert 1.81 acres of land under Williamson Act contracts to non-agricultural uses. As the Project is infrastructure licensed by the CPUC, however, Alternative 5 would be considered an allowable use. Consequently, the alternative would not conflict with any Williamson Act contracts and no impact would occur.

3.2.9.2 Cumulative Effects Analysis

This alternative would largely require the same types of construction activities to build as the proposed Project, with the addition of boring activities associated with construction of the underground portion of the route, and would result in the same operational capacity as the proposed Project. Based on the substantial similarity of Alternative 5 to the proposed Project, this alternative's contribution to cumulative agricultural impacts would be identical to that of the proposed Project.

Geographic Extent

Alternative 5 only differs from the proposed Project in terms of infrastructure; the transmission line route proposed under Alternative 5 is the same as the proposed Project. Therefore, the geographic extent of the cumulative analysis defined for Alternative 2 in Section 3.2.6.2 is also appropriate for Alternative 5. As such, the geographic extent of the cumulative analysis for Alternative 5 is exactly the same as that for Alternative 2 and would include lands within 2 miles of the proposed Project in southern Kern County, eastern Los Angeles County, and southwestern San Bernardino County.

Existing Conditions

The existing cumulative conditions for Alternative 5 are exactly the same as for Alternative 2, as described in Section 3.2.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 5 would be exactly the same as Alternative 2, described in Section 3.2.6.2.

Cumulative Impact Analysis

Based on the substantial similarity of Alternative 5 to Alternative 2, as well as the fact that the proposed route for Alternative 5 is the same as Alternative 2, the contribution of Alternative 5 to cumulative impacts would be identical to that of Alternative 2, as summarized below.

The following impact would not be cumulatively considerable: Impact AG-2 (Operation would permanently convert Farmland to non-agricultural uses). The following impacts would be cumulatively considerable and would combine with similar impacts of other projects to result in impacts that would be significant and unavoidable: Impact AG-1 (Construction activities would temporarily convert Farmland to non-agricultural use), Impact AG-3 (Construction activities would interfere with agricultural operations), and Impact AG-4 (Operation would interfere with agricultural operations).

As the cumulative effects of Alternative 5 would be the same as for the proposed Project, please see Section 3.2.6.2 for a full description of these effects.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 5 in Section 3.2.9.1 would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level for agricultural resources.

3.2.10 Alternative 6: Maximum Helicopter Construction in the ANF Alternative

3.2.10.1 Direct and Indirect Effects Analysis

The significance criteria used to identify impacts to agricultural resources are introduced in Section 3.2.4.1. Impacts associated with Alternative 6 are presented below under the applicable significance criterion.

Convert Farmland to non-agricultural use (Criterion AG1)

The route for Alternative 6 would be the same as the route described for Alternative 2, with the only change to the Project being the inclusion of helicopter staging and landing areas within the ANF. As there are no agricultural resources within the ANF, the impacts associated with the conversion of Farmland to non-agricultural uses (Criterion AG1) for Alternative 6 would be the same as impacts associated with this criterion for Alternative 2. Therefore, the impacts of Alternative 6 on Farmland would be the same as Alternative 2. Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 54.75 acres of Farmland to non-agricultural uses (Impact AG-1). While SCE's APMs AG-1, AG-2, and AG-3 would work to reduce some of the effect of these impacts, they address only a portion of the impacts to Farmland. As the conversion of Farmland would be greater than the 10-acre threshold described in the significance criteria, these impacts would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Operation and maintenance of the T/Ls and access and spur roads would permanently convert 5.83 acres of Farmland to

non-agricultural uses (Impact AG-2). As this total area would be less than the minimum area necessary for sustainable agriculture and less than the minimum DOC mapping unit, the permanent conversion of Farmland to non-agricultural uses would be considered adverse, but not significant (Class III).

Interfere with agricultural operations (Criterion AG2)

As the route for Alternative 6 would be the same as described for Alternative 2 and the helicopter staging and landing areas would affect no agricultural lands, the impacts associated with the interference with agricultural operations (Criterion AG2) would be the same as those described for Alternative 2. The presence and use of heavy equipment, including road graders, dozers, excavators, and trucks, needed to construct the new spur roads could interfere with agricultural operations by damaging crops or soil, impeding access to certain fields or plots of land, obstructing farm vehicles, or potentially disrupting drainage and irrigation systems (Impact AG-3). These interferences could result in a temporary decrease in agricultural productivity. While SCE's APMs AG-1, AG-2, and AG-3 would reduce some of the effect of these impacts, they address only a portion of the impacts on agricultural operations. Construction activities' interference with agricultural operations would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Similarly, the presence of new roads, tower structures, and wire used for the operation and maintenance of Alternative 6 would also interfere with agricultural operations (Impact AG-4). As with the temporary impacts, SCE's APMs AG-1, AG-2, and AG-3 would reduce some of these impacts, but implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) would be necessary to ensure that the significant impact (Class II) would be mitigated to be less than significant.

Conflict with Williamson Act contract lands (Criterion AG3)

As the route for Alternative 6 would be the same as described for Alternative 2 and the helicopter staging and landing areas would affect no agricultural lands, impacts associated with conflicts with Williamson Act contract lands (Criterion AG3) for Alternative 6 would be the same as impacts associated with this criterion for Alternative 2. Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 12.82 acres of land under Williamson Act contracts, and operation and maintenance activities would permanently convert 1.81 acres of land under Williamson Act contracts to non-agricultural uses. As the Project is infrastructure licensed by the CPUC, however, Alternative 6 would be considered an allowable use. Consequently, the alternative would not conflict with any Williamson Act contracts and no impact would occur.

3.2.10.2 Cumulative Effects Analysis

Based on the substantial similarity of Alternative 6 to the proposed Project, as well as the fact that the proposed route for Alternative 6 is the same as the proposed Project, this alternative's contribution to cumulative impacts would be similar or identical to that of the proposed Project.

Geographic Extent

Alternative 6 only differs from the proposed Project in the inclusion of ANF helicopter staging and landing areas; the transmission line route proposed under Alternative 6 is the same as the proposed Project. Therefore, the geographic extent of the cumulative analysis defined for Alternative 2 in Section 3.2.6.2 is also appropriate for Alternative 6. As such, the geographic extent of the cumulative analysis for Alternative 6 is exactly the same as that for Alternative 2 and would include lands within 2 miles of the

proposed Project in southern Kern County, eastern Los Angeles County, and southwestern San Bernardino County.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 6 are exactly the same as for Alternative 2, as described in Section 3.2.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 6 would be exactly the same as Alternative 2, described in Section 3.2.6.2.

Cumulative Impact Analysis

Based on the substantial similarity of Alternative 6 to Alternative 2, as well as the fact that the proposed route for Alternative 6 is the same as Alternative 2, Alternative 6's contribution to cumulative impacts would be identical to that of Alternative 2, as summarized below.

The following impact would not be cumulatively considerable: Impact AG-2 (Operation would permanently convert Farmland to non-agricultural uses). The following impacts would be cumulatively considerable and would combine with similar impacts of other projects to result in impacts that would be significant and unavoidable: Impact AG-1 (Construction activities would temporarily convert Farmland to non-agricultural use), Impact AG-3 (Construction activities would interfere with agricultural operations), and Impact AG-4 (Operation would interfere with agricultural operations).

As the cumulative effects of Alternative 6 would be the same as for the proposed Project, please see Section 3.2.6.2 for a full description of these effects.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 6 in Section 3.2.10.1 would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level for agricultural resources.

3.2.11 Alternative 7: 66-kV Subtransmission Alternative

3.2.11.1 Direct and Indirect Effects Analysis

The significance criteria used to identify impacts to agricultural resources are introduced in Section 3.2.4.1. Impacts associated with Alternative 7 are presented below under the applicable significance criterion.

Convert Farmland to non-agricultural use (Criterion AG1)

The route for Alternative 7 would be the same as the route described for Alternative 2, with the only change to the Project being the inclusion of three 66-kV subtransmission lines. As there are no agricultural resources in this area, the impacts associated with the conversion of Farmland to non-agricultural uses (Criterion AG1) for Alternative 7 would be the same as impacts associated with this criterion for Alternative 2. Therefore, the impacts of Alternative 7 on Farmland would be the same as Alternative 2. Construction of access and spur roads, T/L towers, and stringing and pulling sites would

temporarily convert a total of approximately 54.75 acres of Farmland to non-agricultural uses (Impact AG-1). While SCE's APMs AG-1, AG-2, and AG-3 would work to reduce some of the effect of these impacts, they address only a portion of the impacts to Farmland. As the conversion of Farmland would be greater than the 10-acre threshold described in the significance criteria, these impacts would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Operation and maintenance of the T/Ls and access and spur roads would permanently convert 5.83 acres of Farmland to non-agricultural uses (Impact AG-2). As this total area would be less than the minimum area necessary for sustainable agriculture and less than the minimum DOC mapping unit, the permanent conversion of Farmland to non-agricultural uses would be considered adverse, but not significant (Class III).

Interfere with agricultural operations (Criterion AG2)

As the route for Alternative 7 would be the same as described for Alternative 2 and the 66-kV subtransmission lines would affect no agricultural lands, the impacts associated with the interference with agricultural operations (Criterion AG2) would be the same as those described for Alternative 2. The presence and use of heavy equipment, including road graders, dozers, excavators, and trucks, needed to construct the new spur roads could interfere with agricultural operations by damaging crops or soil, impeding access to certain fields or plots of land, obstructing farm vehicles, or potentially disrupting drainage and irrigation systems (Impact AG-3). These interferences could result in a temporary decrease in agricultural productivity. While SCE's APMs AG-1, AG-2, and AG-3 would reduce some of the effect of these impacts, they address only a portion of the impacts on agricultural operations. Construction activities' interference with agricultural operations would be considered significant (Class II), but could be mitigated to be less than significant with the implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners). Similarly, the presence of new roads, tower structures, and wire used for the operation and maintenance of Alternative 7 would also interfere with agricultural operations (Impact AG-4). As with the temporary impacts, SCE's APMs AG-1, AG-2, and AG-3 would reduce some of these impacts, but implementation of Mitigation Measure AG-1 (Coordinate construction activities with agricultural landowners) would be necessary to ensure that the significant impact (Class II) would be mitigated to be less than significant.

Conflict with Williamson Act contract lands (Criterion AG3)

As the route for Alternative 7 would be the same as described for Alternative 2 and the 66-kV subtransmission lines would affect no agricultural lands, impacts associated with conflicts with Williamson Act contract lands (Criterion AG3) for Alternative 7 would be the same as impacts associated with this criterion for Alternative 2. Construction of access and spur roads, T/L towers, and stringing and pulling sites would temporarily convert a total of approximately 12.82 acres of land under Williamson Act contracts, and operation and maintenance activities would permanently convert 1.81 acres of land under Williamson Act contracts to non-agricultural uses. As the Project is infrastructure licensed by the CPUC, however, Alternative 7 would be considered an allowable use. Consequently, the alternative would not conflict with any Williamson Act contracts and no impact would occur.

3.2.11.2 Cumulative Effects Analysis

Based on the substantial similarity of Alternative 7 to the proposed Project, as well as the fact that the proposed route for Alternative 7 is the same as the proposed Project, this alternative's contribution to cumulative impacts would be similar or identical to that of the proposed Project.

Geographic Extent

Alternative 7 only differs from the proposed Project in the inclusion of three 66-kV subtransmission lines; the transmission line route proposed under Alternative 7 is the same as the proposed Project. Therefore, the geographic extent of the cumulative analysis defined for Alternative 2 in Section 3.2.6.2 is also appropriate for Alternative 7. As such, the geographic extent of the cumulative analysis for Alternative 7 is exactly the same as that for Alternative 2 and would include lands within 2 miles of the proposed Project in southern Kern County, eastern Los Angeles County, and southwestern San Bernardino County.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 7 are exactly the same as for Alternative 2, as described in Section 3.2.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 7 would be exactly the same as Alternative 2, described in Section 3.2.6.2.

Cumulative Impact Analysis

Based on the substantial similarity of Alternative 7 to Alternative 2, as well as the fact that the proposed route for Alternative 7 is the same as Alternative 2, Alternative 7's contribution to cumulative impacts would be identical to that of Alternative 2, as summarized below.

The following impact would not be cumulatively considerable: Impact AG-2 (Operation would permanently convert Farmland to non-agricultural uses). The following impacts would be cumulatively considerable and would combine with similar impacts of other projects to result in impacts that would be significant and unavoidable: Impact AG-1 (Construction activities would temporarily convert Farmland to non-agricultural use), Impact AG-3 (Construction activities would interfere with agricultural operations), and Impact AG-4 (Operation would interfere with agricultural operations).

As the cumulative effects of Alternative 7 would be the same as for the proposed Project, please see Section 3.2.6.2 for a full description of these effects.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 7 in Section 3.2.11.1 would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level for agricultural resources.

3.2.12 Impact Significance Summary

Table 3.2-10 summarizes the direct and indirect environmental impacts of the proposed Project (Alternative 2) and the other alternatives on agricultural resources. The direct and indirect effects of the Project and alternatives have been fully described in Sections 3.2.6 through 3.2.11 above. Alternative 1 (No Project/No Action) impacts are fully described in Section 3.2.5; however, since no potential future project information is available an impact significance level for Alternative 1 is not included in the table below.

Table 3.2-10. Summary of Impacts and Mitigation Measures – Agricultural Resources

Impact	Impact Significance								Mitigation Measures
	Alt. 1+	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
AG-1: Construction activities would temporarily preclude the agricultural use of some Farmland	N/A	Class II	Class II	Class II	Class II	Class II	Class II	No	AG-1: Coordinate construction activities with agricultural landowners.
AG-2: Operation would permanently convert Farmland to non-agricultural use	N/A	Class III	Class III	Class III	Class III	Class III	Class III	No	None recommended.
AG-3: Construction activities would interfere with agricultural operations	N/A	Class II	Class II	Class II	Class II	Class II	Class II	No	AG-1~~: (see Impact AG-1)~~
AG-4: Operation would interfere with agricultural operations	N/A	Class II	Class II	Class II	Class II	Class II	Class II	No	AG-1~~: (see Impact AG-1)~~

N/A = Not Available

* Indicates whether this impact is applicable to the portion of the Project on National Forest System lands.

+ Potential projects would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and subsequently introduce similar types of impacts.

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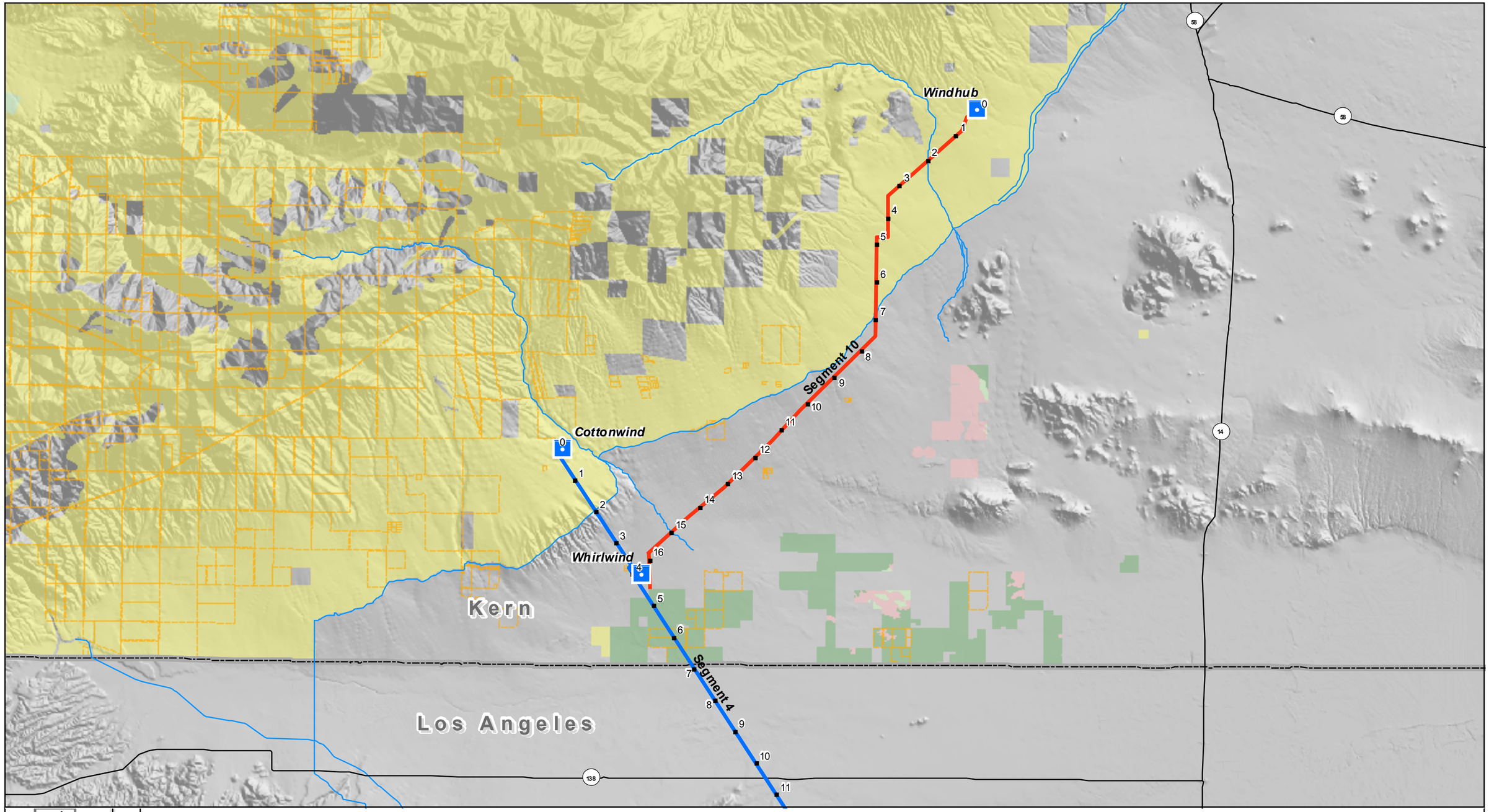


Figure 3.2-1

Kern County Agricultural Lands Traversed by Alternative 2

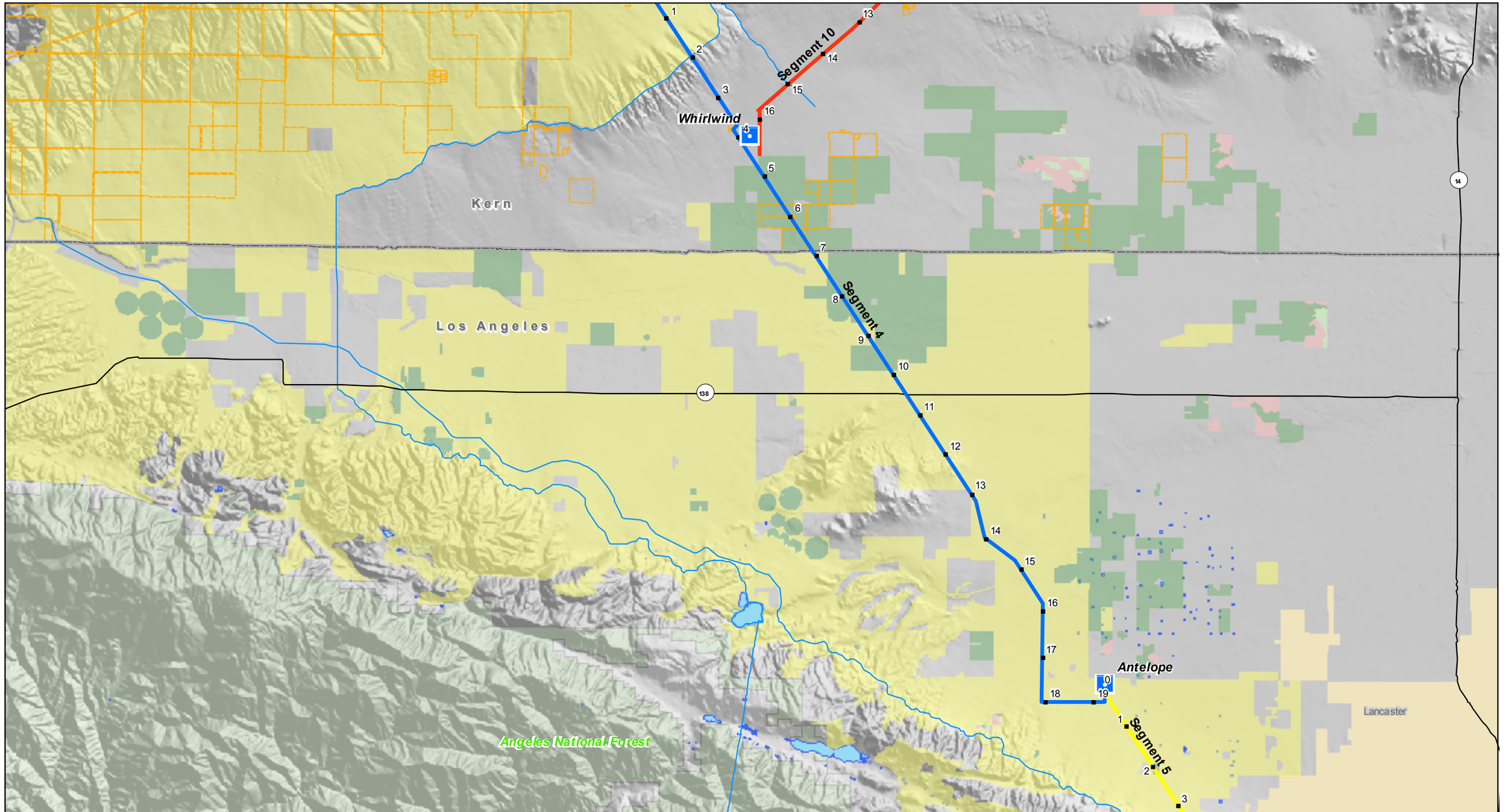


Figure 3.2-2a

Northern Los Angeles County
Agricultural Lands Traversed by Alternative 2 (1of 2)

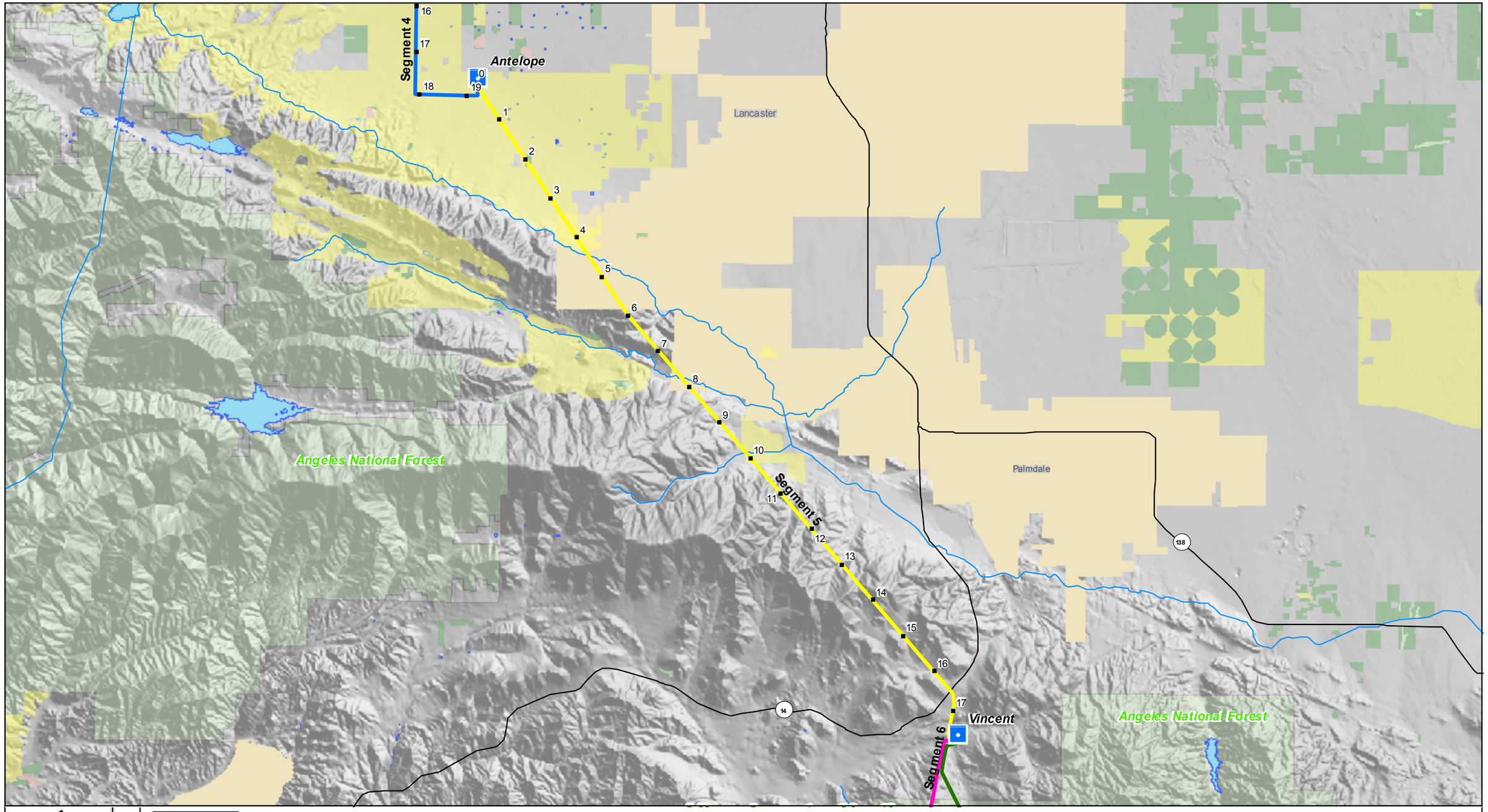
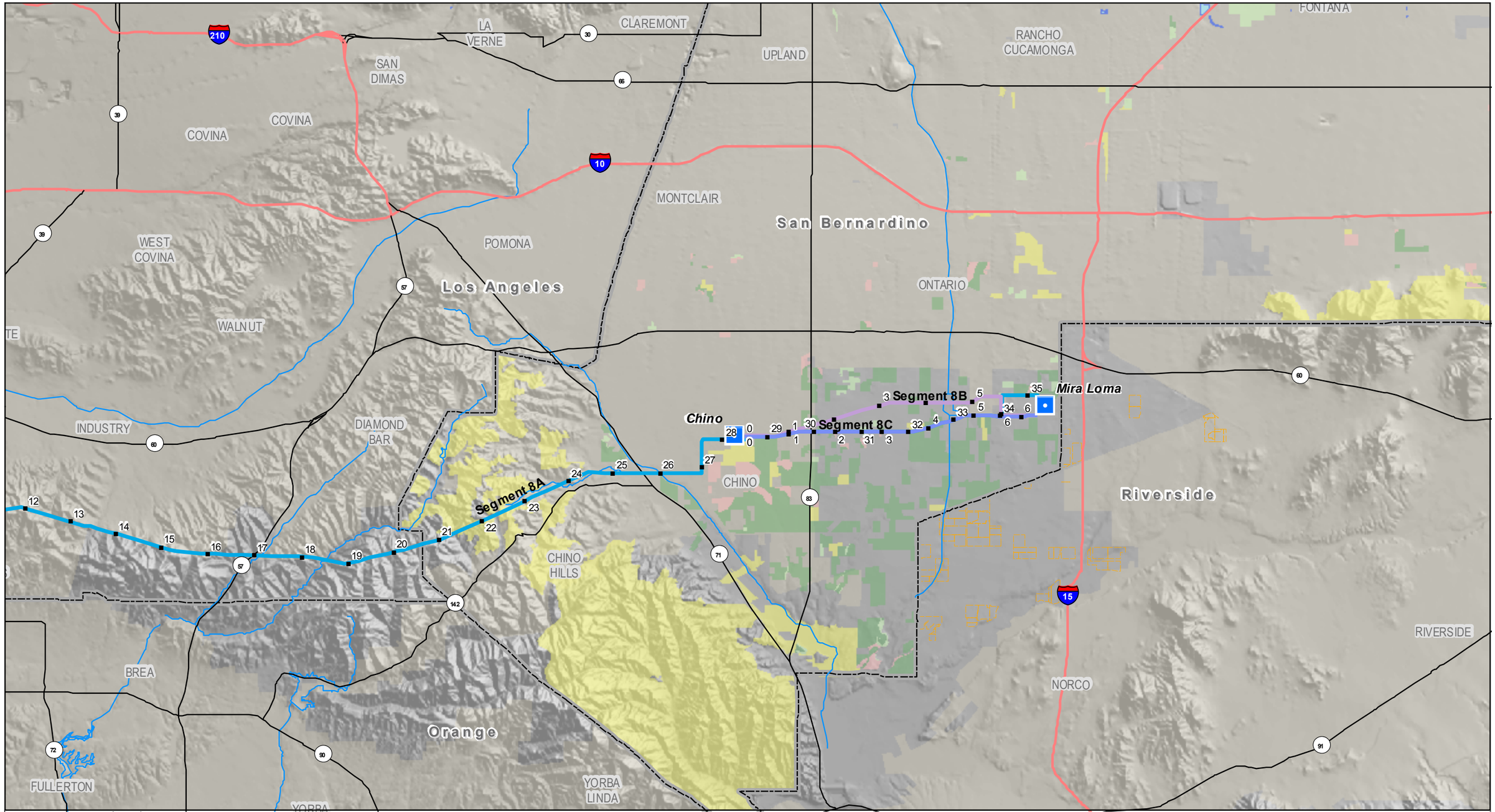
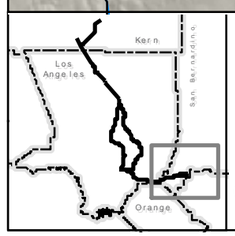


Figure 3.2-2b

Northern Los Angeles County
Agricultural Lands Traversed by Alternative 2 (2 of 2)





Aspen Environmental Group

1" = 2 miles

1:126,720

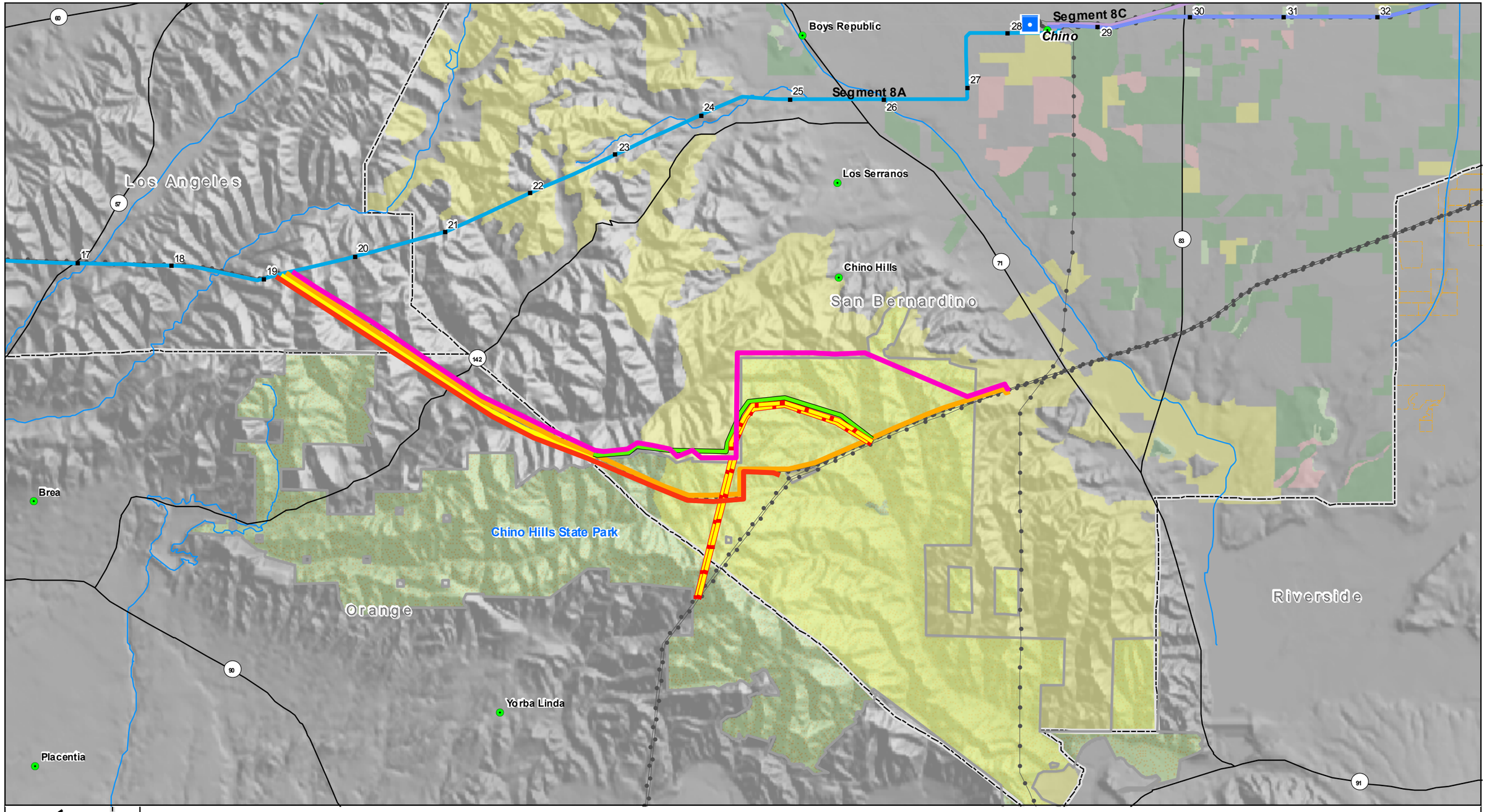
0 0.5 1 2 3 4 Miles

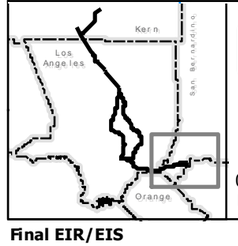
San Bernardino Agricultural Land
- Prime Farmland
- Unique Farmland
- Farmland of Statewide Importance
- Grazing Land
- Williamson Act

Proposed TRTP Routes
- Segment 4
- Segment 5
- Segment 6
- Segment 7
- Segment 8A
- Segment 8B
- Segment 8C
- Segment 10
- Segment 11
- Substation

Figure 3.2-3

San Bernardino County
Agricultural Lands Traversed by Alternative 2





Aspen Environmental Group

1" = 1 miles
1:63,360
0 0.25 0.5 1 1.5 2 Miles

San Bernardino Agricultural Land
- Prime Farmland
- Unique Farmland
- Farmland of Statewide Importance
- Grazing Land
- Williamson Act

Proposed TRTP Routes
- Segment 8A
- Segment 8B
- Segment 8C
- Substation

Chino Hills Alternative 4 Route
- Chino Hills Route A Alternative 500kV
- Chino Hills Route B Alternative 500kV
- Chino Hills Route C Alternative
- Chino Hills Route C Re-route 220kV
- Chino Hills Route C Re-route 500kV
- Chino Hills Route D Alternative 500kV

- Chino Hills State Park
- Existing Transmission Lines

Figure 3.2-4

San Bernardino County
Agricultural Lands Traversed by Alternative 4

3.3 Air Quality

3.3.1 Introduction

This section describes effects on air quality that would be caused by implementation of the TRTP. The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts for a range of Project alternatives, and recommends measures to reduce or avoid adverse impacts anticipated from Project construction and operation. In addition, existing laws and regulations relevant to air quality are described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Project.

Please refer to Appendix C (Air Pollutant Emissions Calculations) for more detailed information air quality emissions calculations, including all assumptions for the Project.

Scoping Issues Addressed

During the scoping period for the EIR/EIS (August-October 2007), a series of scoping meetings were conducted with the public and government agencies, and written comments were received by agencies and the public that identified issues and concerns. The following issues related to air quality that were raised during scoping are addressed in this section:

- The Project may have substantial adverse impact on County of Los Angeles park facilities and recreation services during construction. Certain park patrons are sensitive to the effects of air pollutants including children, elderly, athletes, and person with pre-existing respiratory problems. Mitigation should address minimizing construction vehicle and equipment emissions, idling time and scheduling construction during off-peak times of park use.
- Use SCAQMD CEQA Handbook when preparing the air quality analysis. Identify any potential adverse air quality impacts that could occur from all phases of the Project and all air pollutant sources related to the Project. Both construction and operations should be calculated. Air quality impacts from indirect sources or sources that generate or attract vehicular trips should be included in the analysis. Quantify PM2.5 emission and compare the results to the recommended PM2.5 significance thresholds. In addition to analyzing regional air quality impacts calculate localized air quality impacts and compare results to localized significance thresholds (LSTs). LSTs can be used as a second indication of air quality impacts. Mobile source health risk assessment may also be needed. All feasible mitigation measures shall be identified to minimize or eliminate significant adverse air quality impacts.

Summary and Comparison of Alternatives

Table 3.3-1 on the following page presents some key factors related to air quality for each alternative, including a summary of the direct and indirect effects of the TRTP alternatives on air quality. These impacts are further described in Sections 3.3.5 through 3.3.10.

Table 3.3-1. Summary Comparison of Environmental Issues/Impacts – Air Quality

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3 (West Lancaster)	Alternative 4 (Chino Hills Routes)	Alternative 5 (Partial Underground)	Alternative 6 (Max. Helicopter in ANF)	Alternative 7 (66-kV Subtransmission)
Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds	The impacts of new power plants and new T/Ls could add air pollutants contributing to existing nonattainment conditions or violations of ambient air quality standards, if they occur in areas of substantial existing pollution.	SCAQMD – NOx, VOC, CO, PM10 and PM2.5 thresholds exceeded. AVAQMD – NOx, VOC, CO, and PM10 thresholds exceeded. KCAPCD – PM10 threshold exceeded.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2 with magnitudes of exceedances higher in SCAQMD.	Same as Alternative 2	Same as Alternative 2
Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds	Same as Alternative 2; however, the difference in net emissions of criteria pollutants is unknown.	No exceedances of emission thresholds. Indirect impacts of enabling renewable energy use would be beneficial.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2 with operating emissions higher than Alternative 2	Same as Alternative 2	Same as Alternative 2
The Project would not conform to Federal General Conformity Rules	New transmission lines on federal lands may exceed thresholds and require a General Conformity analysis.	Project would not exceed SoCAB ~~NOx~~ thresholds. General Conformity analysis is not required.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	General Conformity analysis required. ~~Magnitude of~~ SoCAB NOx threshold is exceeded. Emission offset mitigation required to demonstrate conformity.~~ance substantially higher than Alternative 2.~~	Same as Alternative 2
The Project would not conform to Angeles National Forest air quality strategies	A project similar to the TRTP which crosses the ANF with appropriate mitigation would conform with ANF air quality strategies.	With appropriate mitigation the Project would conform with ANF air quality strategies.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2

Table 3.3-1. Summary Comparison of Environmental Issues/Impacts – Air Quality

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3 (West Lancaster)	Alternative 4 (Chino Hills Routes)	Alternative 5 (Partial Underground)	Alternative 6 (Max. Helicopter in ANF)	Alternative 7 (66-kV Subtransmission)
Emissions would contribute to climate change	Same as Alternative 2; however, the difference in net greenhouse gas (GHG) emissions is unknown.	Indirect impacts of enabling renewable energy use are beneficial and greater than the direct emissions from construction and operation of the Project.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2 with direct GHG emissions from construction higher than Alternative 2.	Same as Alternative 2 with direct GHG emissions from construction higher than Alternative 2.	Same as Alternative 2

3.3.2 Affected Environment

The background air quality conditions were determined through a review of criteria pollutant attainment/nonattainment designation data and ambient criteria pollutant concentration data sources that included, but were not limited to, the following:

- U.S. EPA Greenbook data
- State of California, Air Resources Board data
- South Coast Air Quality Management District data
- Proponent's Environmental Assessment

Data obtained will include the latest available existing data from the above sources.

The affected jurisdictions include the Kern County Air Pollution Control District (KCAPCD), the Antelope Valley Air Quality Management District (AVAQMD), and the South Coast Air Quality Management District (SCAQMD). Additionally, the Project route covers two separate air basins, the Mojave Desert Air Basin (MDAB) and South Coast Air Basin (SoCAB) which are separated by the border of the SCAQMD and AVAQMD in the Project area. The Project also traverses through the Angeles National Forest (ANF) and the United States Army Corps of Engineers (USACE) land. Figure 3.3-1 and 3.3-2, located at the end of this section, shows the location of the proposed Project and Project alternatives along with the local air quality jurisdiction, and national forest borders, and USACE land borders. CEQA guidelines and rules and regulations from these local jurisdictions have been reviewed and included as applicable for this Project.

3.3.2.1 Regional Setting

The regional setting is the same for the proposed Project and all Project alternatives as all of the alternatives are variations of the proposed Project without significant differences in location or context from an air quality setting perspective. Therefore, the regional setting is provided once for the proposed Project and alternatives.

Meteorological Conditions

The climate of northwestern Los Angeles County and southeastern Kern County is characterized by hot, dry summers and mild to cold winters with seasonally heavy precipitation that occur primarily during the winter months. Summer typically has clear skies, high temperatures, and low humidity. Monthly climate summaries for Mojave, Lancaster, and El Monte, California, locations within each local jurisdiction traversed by the Project route, were selected to characterize the climate of the study area. As described in Table 3.3-2, average summer (June-August) high and low temperatures in the study area range from 96°F to 50°F, respectively. Average winter (December-March) high and low temperatures in the study area range from 71°F to 34°F. The average annual precipitation of Mojave, Lancaster, and El Monte, California, ranges roughly from 6.6 inches to 18.6 inches with over 70 percent occurring between December and March. Little precipitation occurs during summer because a high-pressure cell blocks migrating storm systems over the eastern Pacific. The Project areas at higher altitudes in the Angeles National Forest (ANF) may have temperatures and precipitation that vary somewhat from that experienced in Mojave, Lancaster, and El Monte.

Table 3.3-2. Monthly Average Temperatures and Precipitation

Month	Mojave			Lancaster			El Monte		
	Temperature, °F		Precipitation Inches	Temperature, °F		Precipitation Inches	Temperature, °F		Precipitation Inches
	Max	Min		Max	Min		Max	Min	
January	58	34	1.34	57	31	1.60	70	56	4.07
February	62	37	1.51	61	35	1.62	71	45	4.66
March	66	41	1.13	65	39	1.44	72	47	3.76
April	72	46	0.22	71	45	0.32	77	50	1.01
May	81	54	0.15	79	53	0.12	79	55	0.41
June	91	62	0.05	89	60	0.05	84	59	0.16
July	97	67	0.16	95	66	0.10	89	62	0.03
August	96	66	0.27	95	64	0.14	90	63	0.10
September	90	59	0.28	88	57	0.20	88	61	0.44
October	79	49	0.28	78	46	0.30	83	55	0.57
November	66	39	0.43	65	35	0.50	76	46	1.29
December	58	33	0.81	57	29	1.01	71	42	2.06

Source: The Weather Channel 2008.
Note: Averaged over a minimum period of 30 years.

The northern end of the Project would be located in the Antelope Valley south and east of the Tehachapi Mountains within the Mojave Desert Air Basin (MDAB). The Project route travels in a general north to south direction crossing through the Antelope Valley, splitting into two routes, south through the Angeles National Forest (ANF), and continuing south through both East and West San Gabriel Valley converging into the Los Angeles Plain in Monterey Park. From Monterey Park the Project continues east to Southeastern Ontario.

The Clean Air Act identifies some wildernesses, Class I Areas, for special protection from long term air pollution emitted by stationary sources. This Project is in fact being proposed to reduce dependence on stationary sources like conventional power plants. But it is also know that air pollutants emitted by this Project, like nitric oxides, ozone and fugitive dust have impacts on visibility and the aquatic and terrestrial ecosystem of these wildernesses. There is only one wilderness area within 10 kilometers of the transmission route (San Gabriel Wilderness) and twenty-six wilderness areas within 100 kilometers of the transmission route. Table 3.3-3 provides a list of the wilderness areas and their closest distance to the Project. Eight of these wilderness areas are also designated ~~at~~ as federal Class I Areas. The nearest Class I Federal Lands area to the Project is the San Gabriel Wilderness. The route for Segment 6 of the Project comes to within one-tenth of a mile from the western border of the San Gabriel Wilderness. The next closest Class I ~~a~~Area is the ~~Cucamonga~~Pleasant View Ridge Wilderness, which is approximately ~~14~~ miles away from Segment 6~~north of Segment 8B~~.

Table 3.3-3. Wilderness Areas, Jurisdiction, and Nearest Project Element

USFS Wilderness Areas	Distance to Project (km)	Nearest Project Element
Aqua Tibia*	78.2	Mira Loma Substation
Bighorn Mountain	78.2	Mira Loma Substation
Chumash	57.6	Segment 4
Cucamonga*	21.8	Segment 8B
Dick Smith	86.5	Segment 4
Domeland*	74.2	Segment 10
Kiavah	59.6	Segment 10
Magic Mountain	11.8	Segment 11

Table 3.3-3. Wilderness Areas, Jurisdiction, and Nearest Project Element		
USFS Wilderness Areas	Distance to Project (km)	Nearest Project Element
Matilija	87.4	Segment 4
Pleasant View Ridge	7.0	Segment 6
San Gabriel*	0.04	Segment 6
San Gorgonio*	55.8	Mira Loma Substation
San Jacinto*	74.1	Mira Loma Substation
San Mateo Canyon	44.0	Mira Loma Substation
Sespe	38.3	Segment 4
Sheep Mountain	17.3	Segment 6
BLM Wilderness Areas		
Bighorn Mountain	82.9	Mira Loma Substation
Black Mountain	93.5	Segment 10
Bright Star	47.9	Segment 10
Chimney Peak	88.0	Segment 10
Domeland*	72.4	Segment 10
El Paso Mountains	57.8	Segment 10
Golden Valley	75.3	Segment 10
Grass Valley	84.6	Segment 10
Kiavah	56.5	Segment 10
Owens Peak	71.2	Segment 10
Sacatar Trail	94.3	Segment 10
San Gorgonio*	77.7	Mira Loma Substation

* Class 1 Federal Lands

Existing Air Quality

The United States Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and the local air districts classify an area as attainment, unclassified, or nonattainment depending on whether or not the monitored ambient air quality data shows compliance, insufficient data available, or non-compliance with the ambient air quality standards, respectively. The National and California Ambient Air Quality Standards (NAAQS and CAAQS) relevant to the Project are provided in Table 3.3-4.

Table 3.3-4. National and California Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	Health Effects
Ozone (O_3)	1-hour	0.09 ppm	—	Breathing difficulties, lung tissue damage
	8-hour	0.070 ppm	0.075 ppm	
Respirable particulate matter (PM_{10})	24-hour	50 µg/m^3	150 µg/m^3	Increased respiratory disease, lung damage, cancer, premature death
	Annual mean	20 µg/m^3	—	
Fine particulate matter ($PM_{2.5}$)	24-hour	—	35 µg/m^3	Increased respiratory disease, lung damage, cancer, premature death
	Annual mean	12 µg/m^3	15 µg/m^3	
Carbon monoxide (CO)	1-hour	20 ppm	35 pm	Chest pain in heart patients, headaches, reduced mental alertness
	8-hour	9.0 ppm	9.0 ppm	
Nitrogen dioxide (NO_2)	1-hour	0.18 ppm	—	Lung irritation and damage
	Annual mean	0.030 ppm	0.053 ppm	
Sulfur dioxide (SO_2)	1-hour	0.25 ppm	—	Increases lung disease and breathing problems for asthmatics
	24-hour	0.04 ppm	0.14 ppm	
	Annual mean	—	0.03 ppm	

Notes: ppm=parts per million; µg/m^3= micrograms per cubic meter; "—" = no standard
Source: CARB, 2008a; CARB, 2009d.

The ambient air quality standards shown in Table 3.3-4 are health-based standards established by the ARB and U.S.EPA. The AAQS are set at levels to adequately protect the health of all members of the public, including those most sensitive to adverse air quality impacts such as the aged, people with existing illnesses, children, and infants, including a margin of safety.

The TRTP project will have a relatively large amount of construction emissions that will be spread out over a very long project route, but will not have a large amount of emissions at any given location or emissions of long-term duration at any given location, such as a new stationary industrial facility. In general, TRTP can be characterized as having the potential for very short-term impacts at any given location, and so will not create or significantly contribute to any of the chronic lung disease health conditions noted in Table 3.3-4. The same conclusion can be made for any other chronic health impacts, such as carcinogenic impacts from diesel particulate matter (DPM) emissions.

The proposed Project area would be located within ~~both~~ the MDAB, which is under the jurisdiction of the Kern County Air Pollution Control District KCAPCD, the Antelope Valley Air Quality Management District (AVAQMD), and the South Coast Air Basin (SoCAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Table 3.3-5 summarizes the federal and State attainment status of criteria pollutants for the Project area based on the NAAQS and CAAQS, respectively.

Table 3.3-5. Attainment Status for the Mojave Desert Air Basin and South Coast Air Basin

Pollutant	Attainment Status Mojave Desert Air Basin		Attainment Status South Coast Air Basin	
	Federal	State	Federal	State
Ozone – 1 Hr	N/A	Extreme and Moderate Nonattainment [1]	N/A	Extreme Nonattainment
Ozone – 8 Hr	Moderate[2]~~Severe~~ and Former Subpart 1~~Moderate~~ Nonattainment [3~~2~~]		Severe-17~~Extreme~~ Nonattainment [4~~3~~]	
CO	Attainment	Attainment	Attainment	Attainment
NO_2	Attainment	Attainment	Attainment	Attainment
SO_2	Attainment	Attainment	Attainment	Attainment
PM10	Attainment	Nonattainment	Serious Nonattainment	Nonattainment
PM2.5	Attainment	Attainment	Nonattainment	Nonattainment

Source: CARB, 2009a~~8b~~; USEPA, 2009~~8a~~.
N/A – Not Applicable
1 - The Antelope Valley Air Quality Management District portion of the MDAB is classified as extreme nonattainment of the state ozone standard due to historical SoCAB designation while Kern County is designated as moderate nonattainment of the state ozone standards.
2 - ~~The Antelope Valley Air Quality Management District portion of the MDAB is in the process of being re-classified as extreme nonattainment while~~ Kern County is in the process of being re-classified to moderate nonattainment of the federal 8-hour state ozone standard.
3 – In its 8-hour ozone SIP submittal, the California Air Resource Board requested that EPA reclassify the AVAQMD portion of the MDAB as severe-17 nonattainment for 8-hour ozone; however, EPA has not rendered a decision on the request.
4~~3~~ – In its 8-hour ozone SIP submittal, the California Air Resource Board requested that EPA reclassify the SoCAB as extreme nonattainment for 8-hour ozone; however, EPA has not rendered a decision on the request. ~~The South Coast Air Basin is in the process of being re-classified as extreme nonattainment~~.

The Project site would be in southeastern Kern County, San Bernardino County, and Los Angeles County. Ozone, CO, NO_2, PM10, and PM2.5 concentrations are currently recorded at the Lancaster Pondera Street and Division Street monitoring stations, located approximately nine miles east of the

Antelope Substation. Ozone, NO_2, PM10, and PM2.5 are currently recorded at the Mojave monitoring station, located in the western portion of the eastern county of the Mojave Desert Air Basin (MDAB) under the jurisdiction of the Kern County Air Pollution Control District (KCAPCD). SO_2 is currently recorded at the Trona and Riverside Rubidoux monitoring stations.

Exhibits 3.3-1 through 3.3-3 summarize the historical air quality data for the Project area collected at the nearest representative air quality monitoring stations in Mojave, Lancaster, and El Monte, respectively. Various monitoring stations in the area were used to compile data from 1997 to 2008~~7~~ (11~~0~~-year period). For ozone, nitrogen dioxide and PM10, the Mojave monitoring station was used (1997-2008~~7~~). And for PM2.5, the Mojave monitoring station was used (1999-2008~~7~~). The following monitoring stations that were used for ozone, carbon monoxide, nitrogen, and PM10 in the Lancaster area were Lancaster West Pondera Street (1997-2001) and Lancaster Division Street (2002-2008~~7~~). And the following monitoring stations that were used for PM2.5 in the Lancaster area were Lancaster West Pondera Street (1999-2001) and Lancaster Division Street (2002-2004). And for sulfur dioxide, the Trona Athol & Telegraph monitoring station was used (1997-2008~~7~~).

For ozone in the South Coast Air Basin area, the following monitoring stations were used due to insufficient data available: Glendora Laurel monitoring station was used (1997-2008~~1999, 2001-2003, 2004-2007), and Azusa (2000, 2004)~~. For carbon monoxide in the South Coast Air Basin area, the following monitoring stations were used: Pasadena South Wilson Avenue (1998, 2000-2002, 2004-2008~~5~~), Pomona (1999, 2003), and ~~Pica~~ Pico Rivera (1997). For nitrogen dioxide in the South Coast Air Basin area, the following monitoring stations were used: Pasadena South Wilson Avenue (1997-1998, 2000-2002, 2005-2008~~7~~), Pomona (1999), and Pico Rivera (2003-2004). For PM10 in the South Coast Air Basin area, the following monitoring stations were used: Ontario Airport (1997), and Ontario 1408 Francis Street (1998-2008~~7~~). For PM2.5 in the South Coast Air Basin area, the following monitoring stations were used: Ontario 1408 Francis Street (1999), and Azusa (2000-2008~~7~~). And for sulfur dioxide, the Riverside Rubidoux monitoring station was used (1997-2008~~7~~).

In Exhibits 3.3-1 through 3.3-3, the short term normalized concentrations are provided from 1997 to 2007. Normalized concentrations represent the ratio of the highest measured concentrations in a given year to the most-stringent currently applicable national or State ambient air quality standard. Therefore, normalized concentrations lower than one indicate~~s~~ that the measured concentrations were lower than the most-stringent ambient air quality standard and conversely normalized concentrations greater than one indicate~~s~~ that the measured concentrations were higher than the most-stringent ambient air quality standard and also gives an indication of the magnitude behavior above the standards being experienced in the Project area.

As shown in Exhibits 3.3-1 through 3.3-3, ambient air quality in the Project area is above the State 1-hour and 8-hour ozone standards, the State 24-hour PM10 standard and other SoCAB above the federal 24-hour PM 2.5 standard.

Ozone

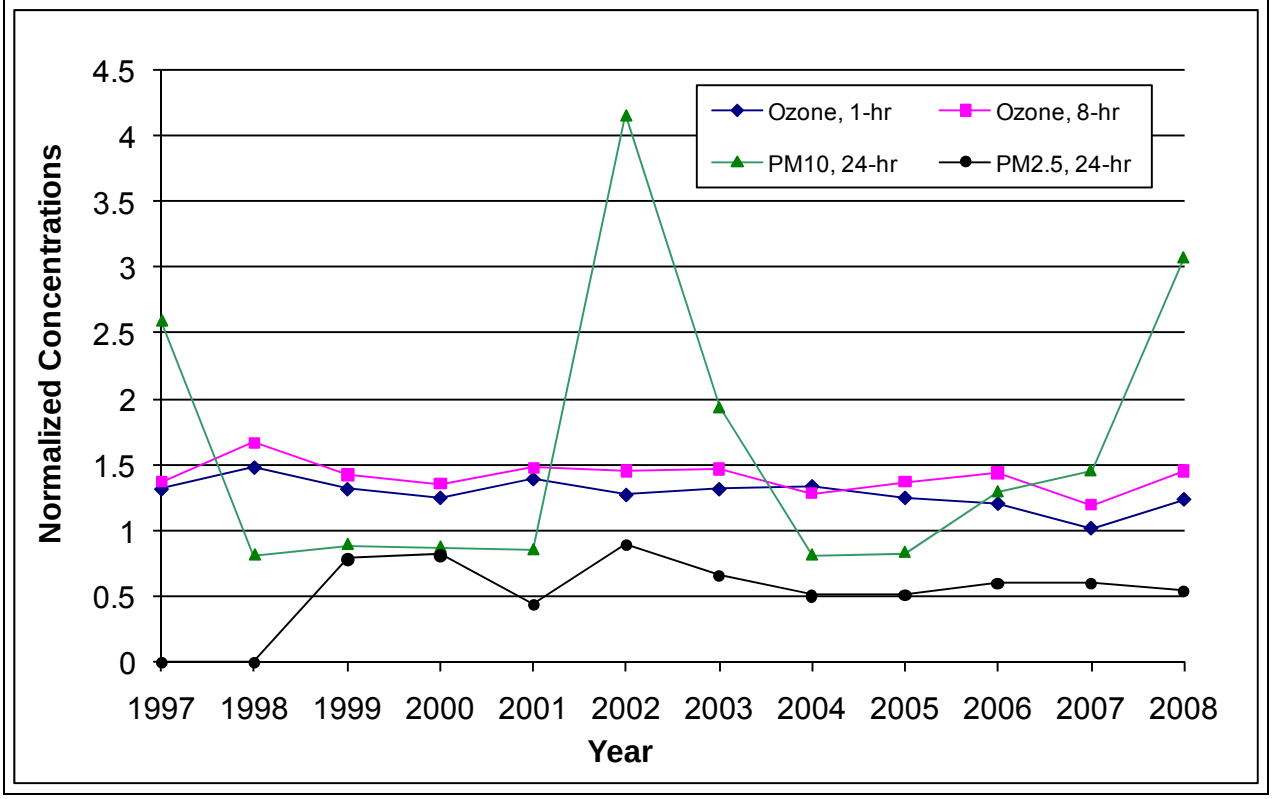
In the presence of ultraviolet radiation, both NOx and VOCs go through a number of complex chemical reactions to form ozone. Table 3.3-6 summarizes the best representative ambient ozone data for the Project area collected over the past six to ten years from monitoring stations in Mojave, Lancaster and SoCAB. The table includes the maximum hourly concentration and the number of days above the National and State standards. As indicated in this table, ozone formation is generally higher in spring and summer and lower in the winter. The Kern County portion of the MDAB is classified as moderate nonattainment

for 1-hour ozone CAAQS, whereas the AVAQMD portion of the MDAB and the SoCAB are~~is~~ classified as extreme nonattainment areas, respectfully. The Kern County portion of the MDAB is currently classified as a former Subpart 1 nonattainment area and the AVAQMD portion of the MDAB is classified as a moderate nonattainment area for the 8-hour ozone NAAQS, whereas the SoCAB is classified as a severe-17 nonattainment area[1].

The year 1997 to 2007 trends for the maximum 1-hour and 8-hour ozone concentrations, referenced to the most stringent standard, and the number of days exceeding the California 1-hour standard and the Federal 8-hour standard for the Mojave, Lancaster, South Coast Air Basin areas are shown in Exhibit 3.3-4 and 3.3-5, respectively.

As shown in Exhibits 3.3-4 and 3.3-5, long-term trends in reduced emissions of ozone precursors have led to reduced ozone formation in the Project area through 1999. After 1999, ozone increased in the Project area although a downward trend between 2003 and 2004 is apparent. In general, ozone continues to be above the State 1-hour and federal 8-hour ozone standards.

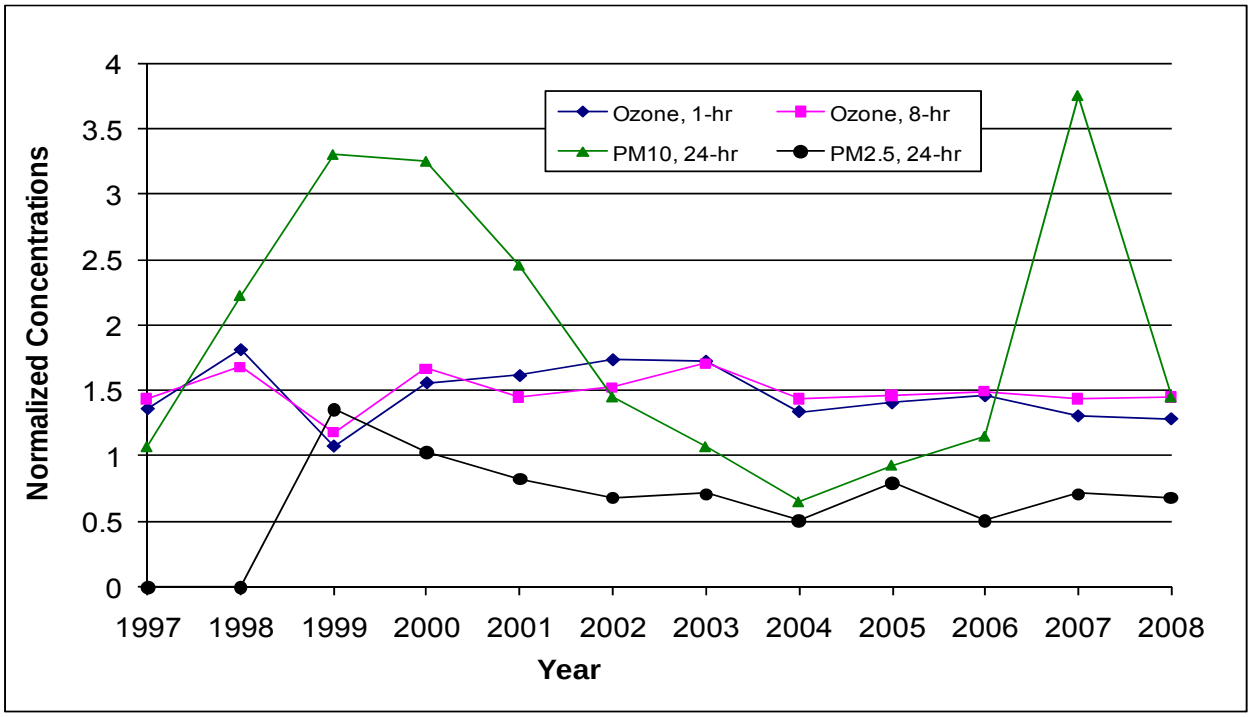
Exhibit 3.3-1. Normalized Maximum Short-term Historical Air Pollutant Concentrations in Mojave 1997-2008 – Revised



Source: CARB, 2009b~~6a~~; CARB, 2009~~8~~c.
Note: A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. For example, in 1990 the highest 1-hour average ozone concentration measured at Lancaster Pondera Street was 0.150 ppm. Since the most stringent ambient air quality standard is the State standard of 0.09 ppm, the 1990 normalized concentration is 0.150/0.09 = 1.67.

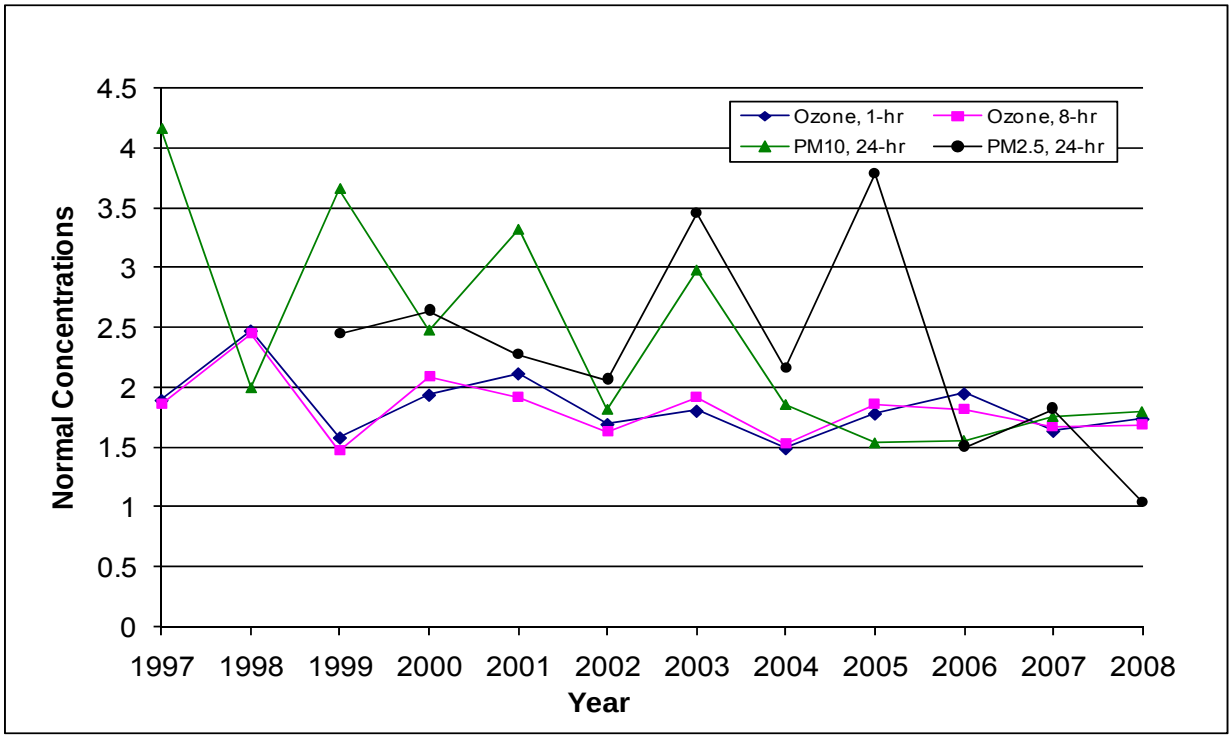
[1] Each of these jurisdictions/air basins are in the process of being redesignated. Eastern Kern County is in the process of being redesignated by USEPA to moderate nonattainment; while CARB in its latest SIP submittal is requesting to AVAQMD portion of the MDAB be redesignated to Severe-17 nonattainment and the SoCAB be redesignated to extreme nonattainment.

Exhibit 3.3-2. Normalized Maximum Short-term Historical Air Pollutant Concentrations in Lancaster 1997-2008 – Revised



Source: CARB, 2009b~~6a~~; CARB, 2009~~8~~c.

Exhibit 3.3-3. Normalized Maximum Short-term Historical Air Pollutant Concentrations in South Coast Air Basin 1997-2008 – Revised



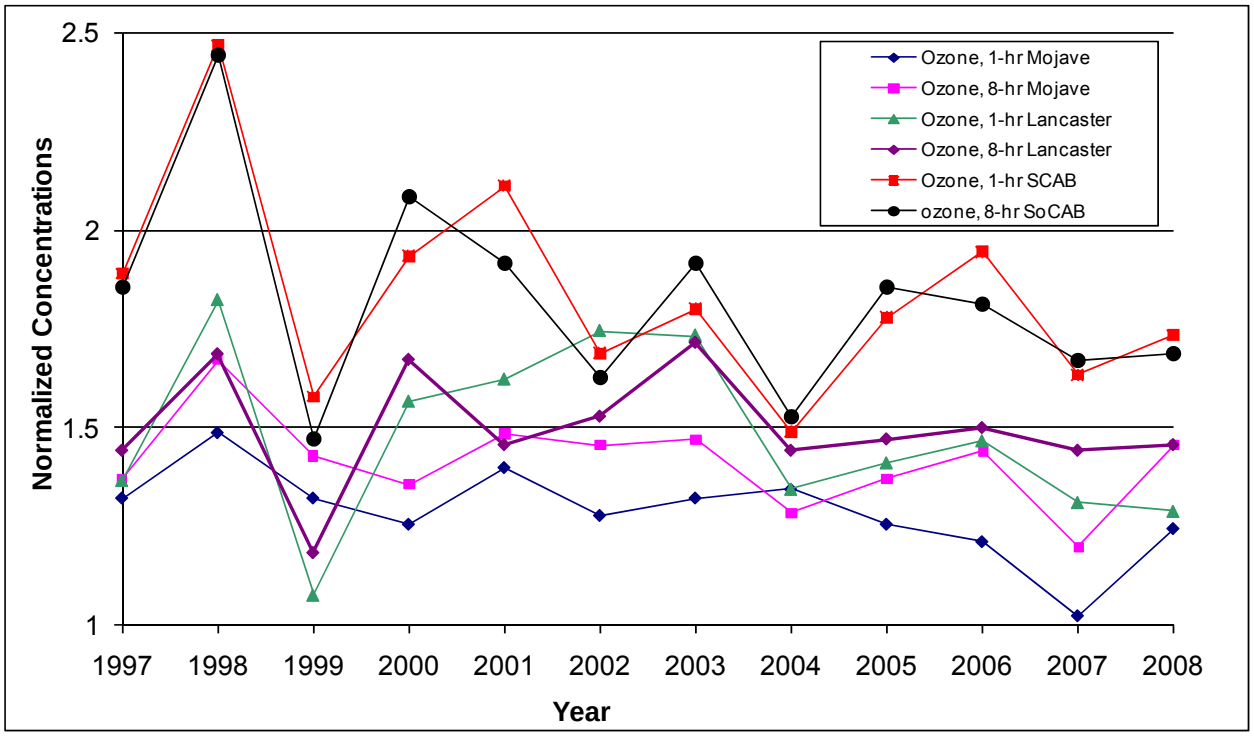
Source: CARB, 2009b~~6a~~; CARB, 2009~~8~~c.

Table 3.3-6. Ozone Air Quality Summary 1997-2008~~7~~ - Revised

Year	Days Above NAAQS 1-Hr	Days Above CAAQS 1-Hr	Month of Max. 1-Hr Avg.	Max. 1-Hr Avg. (ppm)	Days Above NAAQS 8-Hr	Month of Max. 8-Hr Avg.	Max. 8-Hr Avg. (ppm)
	Mojave 923 - Poole Street						
1997	0	22	DEC	0.119	51~~19~~	JUN	0.096
1998	2	43	JUL	0.134	71~~40~~	JUL	0.117
1999	0	39	SEP	0.119	76~~34~~	JUL	0.100
2000	0	25	JUL	0.113	58~~15~~	JUL	0.095
2001	1	33	AUG	0.126	69~~32~~	AUG	0.104
2002	0	18	JUL	0.115	61~~26~~	JUL	0.102
2003	0	31	JUL	0.119	54~~27~~	JUN	0.103
2004	0	8	SEP	0.121	21~~3~~	JUN	0.090
2005	0	8	JUN	0.113	26~~9~~	JUN	0.096
2006	0	10	JUN	0.109	27~~8~~	JUN	0.101
2007	0	0	AUG	0.092	6~~0~~	JUN	0.084
2008	0	15	JUL	0.112	41	JUL	0.102
	Lancaster – W Pondera Street						
1997	0	14	JUN	0.123	19~~7~~	JUN	0.101
1998	8	24	JUL	0.164	36~~18~~	JUL	0.118
1999	0	1	JUN	0.097	4~~0~~	JUN	0.083
2000	2	35	JUL	0.141	59~~28~~	JUL	0.117
2001	3	37	JUL	0.146	55~~24~~	AUG	0.102
	Lancaster – 43301 Division Street						
2001	0	0	NOV	0.052	0	NOV	0.044
2002	5	46	JUL	0.157	69~~38~~	AUG	0.107
2003	4	50	JUL	0.156	64~~33~~	JUL	0.120
2004	0	37	JUN	0.121	59~~24~~	JUN	0.101
2005	1	42	AUG	0.127	60~~31~~	JUL	0.103
2006	2	22	JUL	0.132	39~~16~~	JUN	0.105
2007	0	16	AUG	0.118	42~~14~~	JUN	0.101
2008	0	18	JUL	0.116	34	JUL	0.102
	South Coast Air Basin – Glendora –~~Laurel~~						
1997	18	67	JUL	0.170	45~~24~~	JUL	0.130
1998	28	61	JUL	0.222	49~~37~~	JUL	0.171
1999	3	25	JUL	0.142	19~~7~~	AUG	0.103
2000~~*~~	11	39~~32~~	MAY	0.17~~24~~	30~~21~~	MAY	0.146
2001	13	61	AUG	0.190	49~~28~~	JUN	0.134
2002	12	45	JUL	0.152	33~~21~~	JUL	0.114
2003	22	61	SEP	0.162	58~~40~~	JUL	0.134
2004~~*~~	5~~2~~	42~~28~~	JUN	0.134	33~~16~~	JUN	0.107
2005	8	31	MAY	0.160	27~~13~~	MAY	0.130
2006	11	37	JUL	0.175	30~~15~~	JUL	0.127
2007	3	25	SEP	0.147	26~~14~~	JUL	0.117
2008	12	48	JUN	0.156	46	MAY	0.118

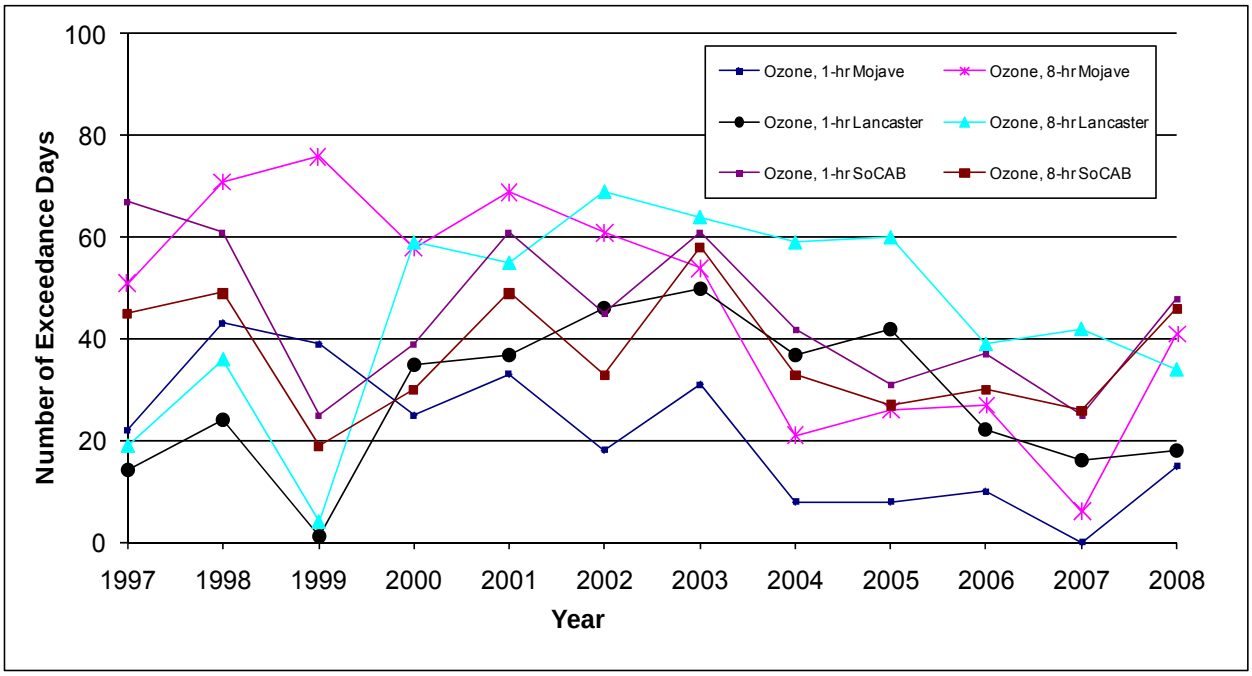
Source: CARB, 2009~~8~~c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.09 ppm
National Ambient Air Quality Standard (NAAQS): 1-hr, 0.12 ppm; 8-hr, 0.08 ppm
~~* used Azusa monitoring station for highest 1 Hr. Avg. concentration within the Project area~~

Exhibit 3.3-4. Normalized Ozone Air Quality Maximum Concentrations ~~(~~1997-2008~~7)~~ - Revised



Source: CARB, 2009b6a; CARB, 2009~~8~~c.
Note: A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for 1-hour ozone is the State standard of 0.09 ppm, and for 8-hr ozone is the national standard of 0.08 ppm.

Exhibit 3.3-5. Ozone – Number of Days Exceeding the CAAQS for 1-Hr and NAAQS for 8-Hr ~~(~~1997-2008~~7)~~ - Revised



Source: CARB, 2009b~~6a~~; CARB, 2009~~8~~c.

Carbon Monoxide (CO)

CO is generally found in high concentrations only near a significant source of emissions (i.e., freeway, busy intersection, etc.). The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since mobile sources (motor vehicles) are the main cause of CO, ambient concentrations of CO are highly dependent on motor vehicle activity. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon. Carbon monoxide concentrations in Los Angeles County and the rest of the State have declined significantly due to two Statewide programs: (1) the 1992 wintertime oxygenated gasoline program, and (2) Phases I and II of the reformulated gasoline program. Additionally, overall vehicle fleet turnover from higher-emitting older engines to lower-emitting new engines is a significant factor in the declining CO levels.

Table 3.3-7 summarizes the best representative ambient carbon monoxide data for the Project area collected over the past ten years from Lancaster and South Coast Air Basin monitoring stations. The table includes the maximum 1-hour and 8-hour concentrations.

Table 3.3-7. Carbon Monoxide Air Quality Summary 1997-2008~~7~~ - Revised

Year	Maximum 1-Hr Avg. (ppm)	Month of Max. 8-Hr Avg.	Maximum 8-Hr Avg. (ppm)
Lancaster – W Pondera Street			
1997	5.9	DEC	3.99
1998	5.4	DEC	3.59
1999	7.2	JAN	5.41
2000	6.0	DEC	4.34
2001	6.1	JAN	3.33
Lancaster – 43301 Division Street			
2001	2.6	DEC	1.70
2002	3.4	SEP	2.24
2003	3.2	DEC	1.88
2004	2.9	JAN	1.72
2005	2.9	DEC	1.54
2006	3.2~~---~~	DEC	1.60
2007	2.5	JAN	1.25
2008	---	NOV	1.04
South Coast Air Basin			
1997	9.2 +	NOV	6.10
1998	8.4 *	NOV	6.30
1999	10 -	JAN	6.46
2000	9.0 *	DEC	7.51
2001	6.6 *	JAN	5.10
2002	6.0 *	NOV	4.05
2003	5.8 -	OCT	4.38
2004	5.2 *	DEC	3.46
2005	4.3 *	JAN	2.83
2006	4.1 *~~—~~	JAN	2.80
2007	3.3 *~~---~~*	NOV	2.28
2008	--- *	NOV	2.21

Source: CARB, 2009~~b6a~~; CARB, 2009~~8~~c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 20; 8-hr, 9.0 ppm

National Ambient Air Quality Standard (NAAQS): 1-hr, 35 ppm; 8-hr, 9 ppm
* used Pasadena – S Wilson Avenue monitoring station
+ used Pico~~a~~ Rivera monitoring station
- used Pomona monitoring station

Much of the proposed Project site route area, or alternative route areas, would be expected to have lower CO levels than those presented in Table 3.3-7, as much of the route would be located in remote areas that would experience minimal or no nearby vehicle traffic, which is the major contributor to CO emissions. As indicated in the table, there have been no exceedances of CAAQS or NAAQS since at least 1997 for the 1-hour and the 8-hour CO standards in Lancaster or in the SoCAB monitoring stations most representative~~on~~ for the Project route. ~~While t~~The Antelope Valley is ~~and SoCAB are both~~ designated as an attainment area for the carbon monoxide CAAQS and NAAQS. The SoCAB is designated as attainment of the carbon monoxide CAAQS and NAAQS, but was previously a serious federal CO that is still listed as a carbon monoxide maintenance area.~~and the Antelope Valley is still designated an attainment area for the NAAQS, the entire SoCAB is designated as a nonattainment area for the NAAQS.~~

Nitrogen Dioxide (NO_2)

The majority of the NOx emitted from combustion sources is in the form of NO, while the balance is mainly NO_2. NO is oxidized by O_2 (oxygen) in the atmosphere to NO_2 but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO_2 generally occur during the fall and not in the winter, when atmospheric conditions favor the trapping of ground level releases of NO but lack significant radiation intensity (less sunlight) to oxidize NO to NO_2. In the summer, the conversion rates of NO to NO_2 are high, but the relatively high temperatures and windy conditions (atmospheric unstable conditions) disperse pollutants, preventing the accumulation of NO_2 to levels approaching the 1-hour ambient air quality standard. NO is also oxidized by O_3 to form NO_2. The formation of NO_2 in the summer with the help of the ozone occurs according to the following reaction:

$$NO + O_3 \rightarrow NO_2 + O_2$$

In urban areas, the ozone concentration level is typically high. That level will drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in downwind rural areas (without sources of fresh NOx emissions) ozone concentrations can remain relatively high.

Table 3.3-8 summarizes the best representative ambient nitrogen dioxide data for the Project area collected over the past ten years from various monitoring stations. The table includes the maximum 1-hour and annual concentrations. As indicated in the table, there have been no exceedances of California Ambient Air Quality Standards or National Ambient Air Quality Standards since at least 1997 for the 1-hour and the annual NO_2 standards. The MDAB is designated as ~~and the SoCAB are~~ either unclassified or in attainment for nitrogen dioxide. The SoCAB, as a former federal NO_2 nonattainment area, is designated as attainment and a maintenance area for the NO_2 NAAQS, and is currently designated as attainment of the NO_2 CAAQS.

Respirable Particulate Matter (PM10)

PM10 can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NOx, SOx, VOC, and ammonia, given the right meteorological conditions, can form particulate matter in the form of nitrates (NO_3), sulfates (SO_4), and organic particles. These pollutants are known as secondary particulates,

because they are not directly emitted, but are formed through complex chemical reactions in the atmosphere.

Table 3.3-8. Nitrogen Dioxide Air Quality Summary 1997-2008~~7~~ - Revised

Year	Month of Max. 1-Hr Avg.	Maximum 1-Hr Avg. (ppm)	Maximum Annual Avg. (ppm)
Mojave – 923 Poole Street			
1997	DEC	0.075	0.010
1998	AUG	0.082	0.011
1999	SEP	0.083	0.010
2000	FEB	0.071	0.010
2001	SEP	0.071	0.010
2002	NOV	0.071	0.009
2003	FEB	0.073	0.009
2004	OCT	0.064	0.008
2005	APR	0.044	---
2006	---	---	---
2007	---	---	---
2008	---	---	---
Lancaster – W Pondera Street			
1997	OCT	0.071	0.014
1998	NOV	0.077	0.016
1999	NOV	0.083	0.018
2000	NOV	0.065	0.016
2001	OCT	0.075	---
Lancaster – 43301 Division Street			
2001	NOV	0.060	---
2002	JUN	0.101	0.016
2003	MAY	0.067	0.015
2004	AUG	0.103	0.015
2005	SEP	0.074	0.015
2006	JUN	0.066	0.015
2007	OCT	0.064	0.015
2008	NOV	0.062	0.013
South Coast Air Basin			
1997 -	NOV	0.171	0.034
1998 -	NOV	0.166	0.035
1999 *	NOV	0.162	0.051
2000 -	DEC	0.173	0.029
2001 -	OCT	0.149	0.034
2002 -	FEB	0.154	0.033
2003 +	OCT	0.142	0.035
2004 +	OCT	0.124	0.031
2005 -	NOV	0.104	0.024
2006	NOV	0.120	0.025
2007	NOV	0.092	0.024
2008	NOV	0.105	0.023

Source: CARB, 2009~~8~~c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.25 ppm
National Ambient Air Quality Standard (NAAQS): Annual, 0.053 ppm
* used Pomona monitoring station
+ used Pico Rivera monitoring station
- used Pasadena-S Wilson Avenue station

Table 3.3-9 summarizes the ambient particulate matter (PM10) data collected from various monitoring stations nearest the Project area. The table includes the maximum 24-hour and annual arithmetic average concentrations.

Table 3.3-9. Particulate Matter (PM10) Air Quality Summary 1997-2008~~7~~ - Revised

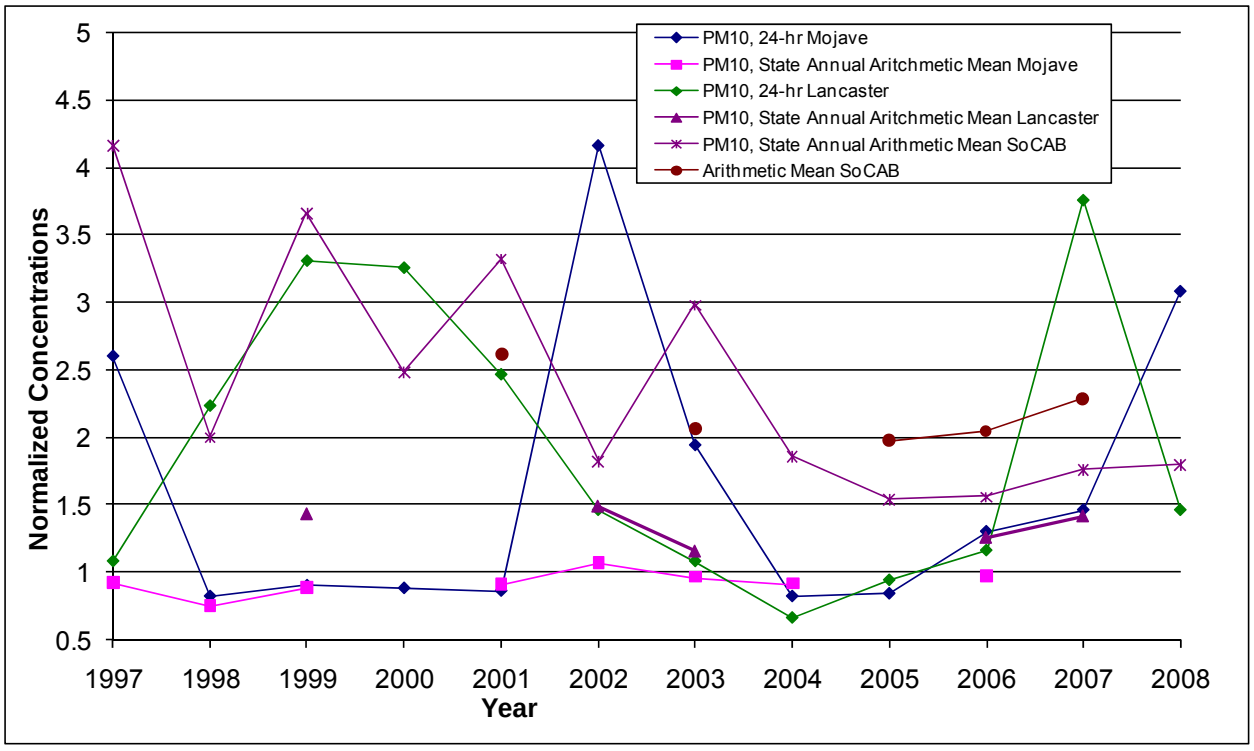
Year	Days * Above Daily NAAQS	Days * Above Daily CAAQS	Month of Max. Daily Avg.	Max. Daily Avg. (µg/m³)	State Annual Arithmetic Mean (µg/m³)
Mojave – 923 Poole Street					
1997	0	6.1	AUG	130	18.4
1998	0	0	APR	41	15
1999	0	0	SEP	45	17.7
2000	0	0	OCT	44	---
2001	0	0	JUN	43	18.2
2002	6.6~~7~~	6.6	OCT	208	21.4
2003	0	12.1	FEB	97	19.3
2004	0	0	SEP	41	18.3
2005	0	0	SEP	42	---
2006	0	13.1	SEP	65	19.5
2007	0	18	APR	73	---
2008	0	13.1	OCT	154	22.4
Lancaster – W Pondera Street					
1997	0	12	FEB	54	---
1998	0	12	DEC	80~~111.7~~	---
1999	0	12.6	DEC	85~~165.5~~	28.6
2000	---	---	MAR	162.9	---
2001	---	---	MAY	123.3	---
Lancaster – 43301 Division Street					
2001	---	---	NOV	50.1~~—~~	---
2002	0	6.1	DEC~~SEP~~	73	29.7
2003	0	6.1	OCT~~JUL~~	57~~54~~	23.2
2004	0	0	SEP~~JUL~~	56~~33~~	---
2005	0	0	JUL~~APR~~	53~~47~~	---
2006	0	25.7	SEP	63~~58~~	25.2
2007	6.5~~0~~	18.3	APR	188	28.3
2008	0	6	APR	73	---
South Coast Air Basin					
1997 +	6	126	OCT	208	---
1998 -	0	12	DEC	100	---
1999 -	6	222	MAY	183	---
2000 -	0	156	NOV	124	---
2001 -	6	154	JAN	166	52.4
2002 -	0	138	SEP	91	---
2003 -	0	90	OCT	149	41.3
2004 -	0	84	MAR	93	---
2005 -	0	109	NOV	77	39.5
2006 -	0	82	FEB	78	40.9
2007 -	6	75	NOV	88	45.7
2008 -	0	18	JUL	90	---

Source: CARB, 2009~~8~~c.
California Ambient Air Quality Standard (CAAQS): 24-hr, 50 µg/m3; annual arithmetic, 20 µg/m3
National Ambient Air Quality Standard (NAAQS): 24-hr, 150 µg/m3; annual arithmetic, 50 µg/m3
* Days above the State and national standard (calculated): Because PM10 is monitored approximately once every six days, the potential number of exceedance days is calculated by multiplying the actual number of days of exceedance by six.
+ used Ontario- Airport monitoring station (due to the insufficient (or no) data available to determine the value)
- used Ontario- 1408 Francis Street monitoring station

As shown in Table 3.3-9, the Project area experiences exceedances of the State and 24-hour PM10 standards and the State annual arithmetic mean PM10 standards. The western MDAB is unclassified for the federal PM10 standard and in nonattainment of the State PM10 standard, whereas the SoCAB is in serious nonattainment for the federal PM10 standard and in nonattainment of the State PM10 standard.

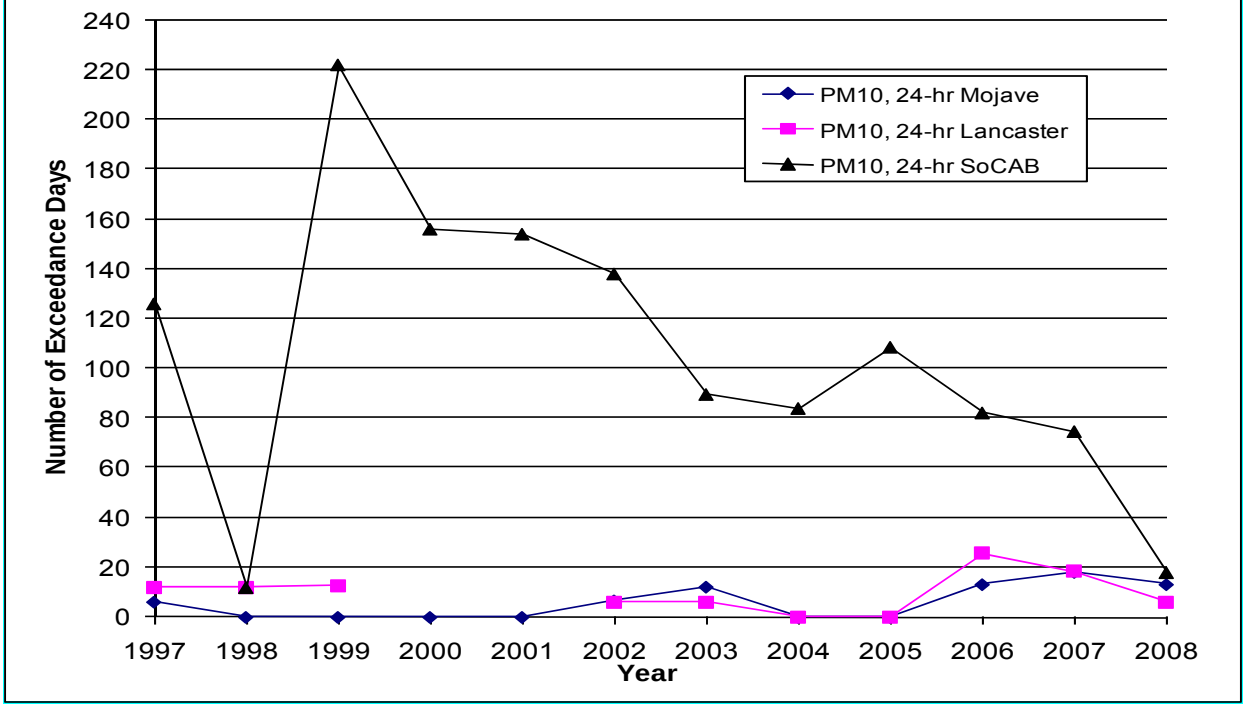
The year 1997 to 2007 trends for the maximum 24-hour PM10 and State annual arithmetic mean PM10, referenced to the most stringent standard, and the number of days exceeding the California 24-hour PM10 standard for the Lancaster West Pondera Street (1997-2001), and Lancaster Division Street (2002-2004) monitoring stations are shown in Exhibits 3.3-6 and 3.3-7, respectively.

Exhibit 3.3-6. Normalized PM10 Air Quality Maximum Concentrations ~~(~~1997-2008~~7)~~ - Revised



Source: CARB, 2009b~~6a~~; CARB, 2009~~8~~c.
a. A Normalized Concentration is the ratio of the highest measured concentration to the applicable most stringent air quality standard. The standard used for 24-hour PM10 is the State standard of 50 $\mu g/m^3$, and for State annual arithmetic mean PM10 is the State standard of 20 $\mu g/m^3$.

Exhibit 3.3-7. PM10 24-Hour – Number of Days Exceeding the CAAQS (1997-2008) – Revised



Source: CARB, 2009b6a; CARB, 20098c.

Fine Particulate Matter (PM2.5)

Table 3.3-10 summarizes the ambient fine particulate matter data collected over the past eight years from Mojave, Azusa, and Lancaster monitoring stations located near the Project area.

As shown in Table 3.3-10, the 98th percentile 24-hour average PM2.5 concentration levels into SoCAB exceed the NAAQS of 635 µg/m^3 and exceed the federal and state annual averages of 15 µg/m^3 and 12 µg/m^3, respectively. The Mojave and Lancaster concentration levels are below all CAAQS and NAAQS. tThe SoCAB is designated nonattainment for the federal and State PM2.5 standards, while the western MDAB and entire MDAB are in attainment of the Federal and State PM2.5 standards, respectively.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of a fuel containing sulfur. Fuels such as natural gas contain very little sulfur and consequently have very low SO_2 emissions when combusted. By contrast, fuels high in sulfur content such as coal or heavy fuel oils can emit very large amounts of SO_2 when combusted. Sources of SO_2 emissions come from every economic sector and include a wide variety of fuels, gaseous, liquid and solid.

The MDAB and the SoCAB are designated attainment or unclassified for all SO_2 State and federal ambient air quality standards. The closest currently operating SO_2 monitoring stations to the Project area is in Trona Athol & Telegraph and Riverside Rubidoux, which have shown no exceedances of CAAQS or NAAQS between 1997 and 2007.

Table 3.3-10 Fine Particulate Matter (PM2.5) Air Quality Summary 1999-2008~~7~~ - Revised

Year	Month of Max. Daily Avg.	Max. Daily Avg. (µg/m³)	98th Percentile of Max. Daily Avg. (µg/m³)	Days Above 98th Percentile Daily NAAQS	National 24-Hr Standard Design Value ~~3-Yr. Avg. 98th Percentile of Max. Daily Avg.~~ (µg/m³)	National Annual Avg. ~~3-Yr. Avg. of national Annual Avg.~~ (µg/m³)	National Annual Standard Design Value (µg/m³)
Mojave – 923 Poole Street							
1999	FEB	27.6	---	0	---	---	---
2000	DEC	28.7	---	0	---	---	---
2001	MAY	15.3	13.9	0	---	6.1	---
2002	OCT	31.4	---	0	---	---	---
2003	NOV	23.2	---	0	---	---	---
2004	JUN	17.8	---	0	---	---	---
2005	JUL	18.1	---	0	---	---	---
2006	SEP	21.3	21.3~~---~~	0	---	---	---
2007	DEC	21.1	19.9	0	---	6.2	---
2008	JUL	19.1	17.8	0	---	6.8	---
Lancaster – W Pondera Street							
1999	JUL	47.6	23.5	0	---	11.2	---
2000	DEC	36	21.0	0	---	10.5	---
2001	JAN	35	---	0	---	---	---
Lancaster – 43301 Division Street							
2001	DEC	29.0~~47.6~~	---	0	---	---	---
2002	OCT	24.0~~36~~	~~---20.0~~	0	---	~~---10.4~~	---
2003	MAR	25.0~~35~~	17.0	0	---	9.4	---
2004	JUL	18.0~~47.6~~	15.0	0	~~---17~~	8.5	~~---9~~
2005	FEB	28.0~~36~~	16	0	16	8.9	8.9
2006	SEP	18.0~~35~~	13	0	15	7.4	8.3
2007	OCT	25	20	0	16	8.0	8.1
2008	MAY	24	---	---	---	---	---
South Coast Air Basin							
1999+	JAN	85.8	85.6	~~---2~~	---	25.4	---
2000*	OCT	92.5	61.6	35.1~~5~~	---	20.2	---
2001*	NOV	79.7	61.4	49.3~~4~~	62~~---~~	21.7	---
2002*	OCT	72.4	52.6	46.8~~1~~	59	20.7	20.8
2003*	JUL	121.2	55.5~~---~~	~~---3~~	57~~---~~	19.3	20.6
2004*	JUL	75.6	53.8~~---~~	~~---1~~	54~~---~~	18.3	19.4
2005*	JUL	132.6	53.2~~---~~	~~---1~~	54~~---~~	17	18.2
2006*	NOV	52.7	38.4~~---~~	~~---0~~	48~~---~~	15.4	16.9
2007*	NOV	63.8	49.2~~---~~	~~---0~~	47~~---~~	15.7	15.7~~6~~
2008*	FEB	36.4	26.5	---	38	---	---

Source: CARB, 2009~~8~~c.

National Ambient Air Quality Standard: 3-Year Average - 98th Percentile of 24-Hr Avg. Conc., 65 µg/m³.

3-Year Average of Annual Arithmetic Mean (National Annual Average), 15 µg/m³; 3-Year Average of Annual Arithmetic Mean (State Annual Average), 12µg/m³

+ used Ontario-1408 Francis Street monitoring station

* used Azusa monitoring station

Due to the restrictions for the use of high sulfur fuels, reduction in gasoline and diesel sulfur contents and reduction in SOx emissions from other industrial sources, such as refineries, SOx pollution is no longer a major air quality concern in most of California including the Project area.

Table 3.3-11. Sulfur Dioxide Air Quality Summary 1997-2008~~7~~ -Revised			
Year	Month of Max. 1-Hr Avg.	Maximum 1-Hr Avg. (ppm)	Maximum Annual Avg. (ppm)
Trona – Athol & Telegraph			
1997	NOV	0.005	0.001
1998	MAR	0.010	0.001
1999	NOV	0.006	0.002
2000	OCT	0.006	0.001
2001	AUG	0.007	0.001
2002	SEP	0.007	0.001
2003	APR	0.003	0.001
2004	MAR	0.005	0.001
2005	NOV	0.004	0.001
2006	APR	0.004	0.001
2007	JUN	0.005	0.001
2008	MAY	0.005	0.001
Riverside – Rubidoux			
1997	NOV	0.005	0.001
1998	NOV	0.009	0.001
1999	FEB	0.012	0.002
2000	MAR	0.038	0.001
2001	AUG	0.009	0.001
2002	FEB	0.003	---
2003	JUL	0.012	0.002
2004	JUN	0.015	0.003
2005	SEP	0.011	0.003
2006	NOV	0.003	0.001
2007	MAR	0.004	0.002
2008	JUL	0.003	0.001

Source: CARB, 2009~~8~~c.
California Ambient Air Quality Standard (CAAQS): 1-hr, 0.25 ppm
National Ambient Air Quality Standard (NAAQS): Annual, 0.053 ppm

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill and the chronically ill, especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

A land use survey was conducted to identify sensitive receptors (e.g., local residences, schools, hospitals, churches, recreational facilities) in the general vicinity of the proposed Project alignment. In the Kern County and Antelope Valley Project segments, and through Angeles National Forest, the transmission

lines would travel through generally undeveloped areas where only a few rural residences have been identified. However, south of where the transmission line would exit Angeles National Forest the Project segments travel through populated areas in Los Angeles and San Bernardino County where residences and other sensitive receptors will be located near or adjacent the construction route/construction sites. Additional information about specific sensitive receptors that may be impacted by the proposed Project will be provided with the evaluation of impacts for each of the Project alternatives.

Greenhouse Gases

Greenhouse gases (GHG) that may contribute to global climate change include water vapor, carbon dioxide (CO_2), several trace gases and aerosols. Currently, California regulates the following man-made emissions for GHG control: are carbon dioxide (CO_2), methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (SF_6). In response to Executive Order S-3-05 (June 2005), which declared California's particular vulnerability to climate change, the California Global Warming Solutions Act of 2006, Assembly Bill 32 (AB32), was signed into effect on September 27, 2006. In passing the bill, the California Legislature found that

> *"Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems"* (California Health & Safety Code, Sec. 38500, Division 25.5, Part 1).

Emissions of CO_2 occur largely from combustion of fossil fuels. The major categories of fossil fuel combustion CO_2 sources can be broken into sectors for residential, commercial, industrial, transportation, and electricity generation. The transportation sector includes all motor gasoline and diesel fuel combustion, and the GHG emissions of this sector are not split into activities or uses (i.e., there is no separate estimate for the level of GHG emissions caused by gasoline or diesel fuel combustion related to statewide construction activities). Other GHG emissions such as methane (CH_4) and nitrous oxide (N_2O) are also tracked by State inventories but occur in much smaller quantities. The global warming potential of methane is about 21 times that of CO_2. When quantifying GHG emissions, the different global warming potentials of GHG pollutants are usually taken into account by normalizing their rates to an equivalent CO_2 emission rate (CO_2e Eq.).

California's greenhouse gas emissions are large in a world-scale context and growing over time (CEC, 2007). The State is responsible for approximately 500 million metric tons of CO_2 equivalent ($MMTCO_2$e Eq.) or more than one percent of the 49,000 $MMTCO_2$e Eq. emitted globally (IPCC, 2007). Electricity generation within California is responsible for about 50 million metric tons of CO_2 (depending on yearly variations) or 15 percent of the total statewide CO_2 emissions and about one percent of statewide methane emissions. Electricity generation in other states delivered to California over high-voltage transmission lines also causes a substantial quantity of GHG emissions, about 10 percent more than the amount from in-state electricity generation. The use of sulfur hexafluoride (SF_6) in power transformers and circuit breakers at power plants and along transmission lines also poses a concern, because this pollutant can slowly escape from the equipment, and it has an extremely high global warming potential (one ton of SF_6 is equivalent to approximately 23,900 tons of CO_2).

Statewide emissions of greenhouse gases from relevant source categories in 1990 and later years are summarized in Table 3.3-12.

Table 3.3-12. California Greenhouse Gas Emissions (million metric tons CO_2e ~~Eq.~~)

Emission Inventory Category	1990		2000	2001	2002	2003	2004	2005
Residential Fuel Combustion (CO_2)	28.97		30.25	27.21	27.32	26.40	27.86	---
Commercial Fuel Combustion (CO_2)	12.65		15.63	12.04	17.84	15.06	12.1	---
Industrial Fuel Combustion (CO_2)	66.12		76.17	80.48	71.53	65.47	67.1	---
Transportation Fuel Combustion (CO_2)	161.08		181.68	182.49	190.19	180.64	187.95	---
Electricity Generation, In-State (CO_2)	43.36		55.87	61.35	47.78	45.92	55.10	49.0
Elec. Generation Subtotal, Natural Gas (CO_2)	36.42		49.71	55.48	41.98	40.56	48.94	43.0
Elec. Generation Subtotal, Coal (CO_2)	2.33		2.26	2.13	2.39	2.17	2.58	2.2
Elec. Generation Subtotal, Petroleum (CO_2)	4.61		3.90	3.74	3.41	3.20	3.59	3.7
Methane (all CH_4 shown as CO_2e ~~Eq.~~)	25.82		26.32	26.62	27.07	27.49	27.80	---
Nitrous Oxide (all N_2O shown as CO_2e ~~Eq.~~)	32.75		31.43	30.76	34.48	33.85	33.34	---
Electricity Transmission and Distribution (SF_6 shown as CO_2e ~~Eq.~~)	2.32		1.14	1.10	1.04	1.01	1.02	---
Total California Greenhouse Gas Emissions without Electricity Imports	389.97		440.47	446.35	444.86	423.20	439.19	---
Electricity Imports (CO_2e ~~Eq.~~)	43.31		40.48	47.37	51.73	56.44	60.81	---
Total California Greenhouse Gas Emissions with Electricity Imports	433.28		480.94	493.72	496.59	479.64	500.00	---

Source: California Energy Commission, 2007. (Totals include source categories not shown. Data reflect changes in memo from CEC to CARB dated January 23, 2007.)

The proposed Project would serve both existing and future renewable power, primarily wind power, sources in the western high desert. This will allow a reduction in the use of other power generation facilities including fossil fueled fired power plants within the SoCAB or elsewhere allowing a reduction in GHG emissions from electricity generation.

3.3.3 Applicable Laws, Regulations, and Standards

The proposed Project includes construction but does not include any stationary emission sources, so there are very few direct air quality regulations that specifically regulate the Project's air quality emission sources. The regulations that do apply, such as fugitive dust regulations, tend to be general and allow multiple means of achieving compliance. A description of the specific and general regulations that apply to the Project is provided below.

3.3.3.1 Federal

The United States Environmental Protection Agency (USEPA) has issued a number of National Ambient Air Quality Standards (NAAQS). Pollutants regulated under these standards include ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter (PM10), fine particulate matter (PM2.5), and sulfur dioxide (SO_2). Additional information regarding the NAAQS that are relevant to the Project is provided in Section 3.3.2.1. The South Coast Air Quality Management District (SCAQMD) and the California Air Resources Board (CARB) are the responsible agencies for providing attainment

plans and meeting attainment with these standards; and the USEPA reviews and approves these plans and regulations that are designed to attain and maintain attainment with the NAAQS.

USEPA has a number of other regulations under the authority of the federal Clean Air Act (such as New Source Review (NSR), Prevention of Significant Deterioration (PSD), Title V permitting program, etc.); however, none of these regulations apply to this Project because the Project would have no operating stationary emission sources. Therefore, a PSD air quality impact analysis of the proposed Project's impacts to the nearest mandatory Class I area is not required.

The USEPA does have on-road and off-road engine emission reduction programs that indirectly affect the Project's emissions through the phasing in of cleaner on-road and off-road equipment engines.

The USDA Forest Service regulates the portion of the Project's route that goes through the Angeles National Forest (ANF) and the Forest Service has prepared a Land Management Plan (Forest Plan) for the ANF (USDA Forest Service, 2005). The Angeles National Forest Plan Strategy does not include any air quality strategies that would be significantly impacted by the construction or operation of the proposed Project. The Angeles National Forest air quality strategies are limited to the following:

- AIR 1: Minimize Smoke and Dust
- AIR 2: Forest Air Quality Emissions

The Angeles National Forest strategy AIR 1 is very general and is directed to "Control and reduce fugitive dust to protect human health, improve safety and moderate or eliminate environmental impacts." The only action item of this of this strategy is to "Incorporate visibility requirements into project plans." The Angeles National Forest air quality strategy AIR 2 relates to providing an air quality inventory for prescribed burns and wildfires and therefore does not directly relate to the proposed Project's construction and operation emissions.

-Per Section 176(c) of the Clean Air Act Amendments (CAAA) of 1990, the Forest Service must make a determination of whether the proposed Project (i.e., Proposed Action) and Project alternatives "conforms" with the State Implementation Plan (SIP). A small portion of Project's route also goes through the land of United States Army Corps of Engineers, and the USACE must make a determination of whether the proposed Project (i.e., Proposed Action) and Project alternatives "conforms" with the State Implementation Plan (SIP), based on the General Conformity requirements (40 CFR Part 93 et seq; November1993). Conformity is defined as compliance with the SIP's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of such standards, and that the activities will not:

- Cause or contribute to any new violation of any standard;
- Interfere with provisions in the applicable SIP for maintenance of any standard;
- Increase the frequency or severity of any violation of any standard in any area; or
- Delay timely attainment of any standard or any required interim emission reductions or other milestones in any area

However, for both the Forest Service and the USACE, if the total direct and indirect emissions from the proposed Project and Project alternatives are below the General Conformity Rule applicability emission trigger levels, and where no "regionally significant" emissions would occur, the proposed Project would be exempt from performing a comprehensive Air Quality Conformity Analysis and Determination, and would be considered to be in conformity with the SIP. A "regionally significant" action would occur only where the direct and indirect emissions of any pollutant represent 10 percent or more of a non-attainment area's emissions inventory for that pollutant (See 40 CFR §93.152). If an Air Quality Conformity

Analysis and Determination is necessary it must be certified prior to the Project's Record of Decision (ROD).

3.3.3.2 State

CARB has issued a number of California Ambient Air Quality Standards (CAAQS). These standards include pollutants not covered under the NAAQS and also require more stringent standards than provided under the NAAQS. Pollutants regulated under these standards include ozone, nitrogen dioxide (NO_2), carbon monoxide (CO), respirable particulate matter (PM10), fine particulate matter (PM2.5), sulfur dioxide (SO_2), lead, sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles. Additional information regarding the CAAQS that are relevant to the Project is provided Section 3.3.2.1.

CARB, like USEPA, also has on-road and off-road engine emission reduction programs that indirectly affect the Project's emissions through the phasing in of cleaner on-road and off-road equipment engines. Additionally, CARB has a Portable Equipment Registration Program that allows owners or operators of portable engines and associated equipment to register their units under a Statewide portable program to operate their equipment, which must meet specified program emission requirements, throughout California without having to obtain individual permits from local air districts.

The State recently enacted a new regulation for the reduction of diesel particulate matter (DPM) and criteria pollutant emissions from in-use off-road diesel-fueled vehicles (CCR Title 13, Article 4.8, Chapter 9, Section 2449). This regulation provides target emission rates for particulate matter and NOx emissions from owners of fleets of diesel-fueled off-road vehicles. This regulation applies to equipment fleets of three specific sizes and the target emission rates are reduced over time. This regulation would begin implementation prior to the end of Project construction.

3.3.3.3 Local

The proposed Project is routed through three separate local jurisdictions, the KCAPCD, the AVAQMD, and the SCAQMD. The local jurisdictions are responsible for planning, implementing, and enforcing federal and State ambient standards within their jurisdictions. The regulations of these agencies are focused on stationary sources; therefore, most of the local agency regulations are not relevant to this Project. However, portable engines used during construction that are larger than 50 hp and that are not registered under the CARB Portable Equipment Registration Program would need to be obtain permits from the local jurisdictions.

All three agencies have visible emissions, nuisance, and fugitive dust regulations with which the Project's construction will need to comply. The specific regulations are as follows:

- AVAQMD Rule 401 – Visible Emissions
- AVAQMD Rule 402 – Nuisance
- AVAQMD Rule 403 – Fugitive Dust
- KCAPCD Rule 401 – Visible Emissions
- KCAPCD Rule 402 – Fugitive Dust
- KCAPCD Rule 419 – Nuisance
- SCAQMD Rule 401 – Visible Emissions
- SCAQMD Rule 402 – Nuisance
- SCAQMD Rule 403 – Fugitive Dust

These rules limit the visible dust emissions from the Project construction sites, prohibit emissions that can cause a public nuisance, and require the prevention and reduction of fugitive dust emissions. One or more measures are required by the Fugitive Dust rules to reduce fugitive dust emissions from specific dust causing activities. These measures may include, adding freeboard to haul vehicles, covering loose

material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities (such as during periods of high winds).

SCAQMD has also recently enacted Rule 2446 that implements portions of Title 13, Article 4.8, Chapter 9, Section 2449.3 of the California Code of Regulations (CCR)[2]. This rule does not apply directly to the Project but could impact construction contractor off-road vehicle fleets.

Climate Change Policies and Regulations

California Global Warming Solutions Act of 2006 (AB32). This law requires CARB to adopt a statewide greenhouse gas emissions limit equivalent to the statewide GHG emissions levels in 1990 to be achieved by 2020. To achieve this, CARB has a mandate to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions.

CARB announced early action GHG reduction measures in June 2007 and is expected to establish a state-wide emissions cap for 2020 by January 2008. Also by January 2008, CARB is scheduled to adopt regulations requiring mandatory GHG emissions reporting. The remainder of the timeline for implementation would have CARB adopting a plan by January 1, 2009 that would indicate how emission reductions will be achieved from significant sources of GHGs via regulations, market mechanisms, and other actions. Then, during 2009, ARB staff would draft rule language to implement its plan and hold public workshops on each measure including market mechanisms (CARB, 2006b).

Strategies that the State should pursue for managing GHG emissions in California are identified in the California Climate Action Team's Report to the Governor (CalEPA, 2006). Many focus on generally reducing consumption of petroleum across all areas of the California economy. Improvements in transportation energy efficiency (fuel economy) and alternatives to petroleum-based fuels are slated to provide substantial reductions by 2020 (CalEPA, 2006). Initially, three "discrete" early action measures to reduce GHG emissions between 13 and 26 $MMTCO_2e$ ~~Eq.~~ annually by 2020 are being pursued: the Low Carbon Fuel Standard; reduction of refrigerant losses from motor vehicle air conditioning maintenance; and increased methane capture from landfills (CARB, 2007). In early 2008, the CPUC and California Energy Commission found that a cap-and-trade program would enable CARB to cost-effectively reduce GHG emissions from the electricity sector, but allowances and offset programs for carbon trading in California are still in the developmental phase (CPUC Rulemaking R. 06-04-009).

CPUC GHG Emissions Performance Standard. The Electricity GHG Emission Standards Act (SB1368) was enacted in 2006, and at its January 25, 2007 meeting, the CPUC adopted GHG requirements in the form of an Emissions Performance Standard for any long-term power commitments made by the State's electrical utilities. Utilities are not allowed to enter into a long-term commitment to buy base load power from power plants that have CO_2 emissions greater than 1,100 pounds (0.5 metric tons) per megawatt-hour (MWh), which is roughly the amount emitted by a combined cycle turbine fueled with natural gas. The GHG Emissions Performance Standard applies to new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or more, including contracts with power plants located outside of California.[3] On May 23, 2007, the CEC also adopted a performance standard consistent with that adopted by the CPUC.[4]

[2] See discussion of this CCR above in the State regulation discussion.
[3] See Rule at http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm
[4] See CEC Docket # 06-OIR-1, http://www.energy.ca.gov/ghgstandards/index.html.

IPCC Key Mitigation Technologies and Practices for Energy Supply. In the absence of explicit State or federal GHG requirements at this time, international literature also provides policy direction. The Intergovernmental Panel on Climate Change (IPCC) provides a broad overview of climate change mitigation strategies that are available to policy-makers and decision-makers. The following strategies are identified by IPCC for decisions related to energy supply (IPCC, 2007).

- **Key mitigation technologies and practices currently commercially available.** Improved energy supply and distribution efficiency; fuel switching from coal to gas; nuclear power; renewable heat and power (hydropower, solar, wind, geothermal, and bioenergy); combined heat and power; early applications of Carbon Capture and Storage (e.g., storage of removed CO2 from natural gas).
- **Key mitigation technologies and practices projected to be commercialized before 2030.** Carbon capture and storage for gas, biomass and coal-fired electricity generating facilities; advanced nuclear power; advanced renewable energy, including tidal and waves energy, concentrating solar, and solar photovoltaic.

Local Climate Change Plans. There are many jurisdictions (city and county) within California that have adopted climate change plans (OPR 2008). This Project is not known to traverse any of the jurisdictions that have adopted climate changes plans; however the City of Pasadena and the Los Angeles County have passed Green Building Programs. These two green building programs do not appear to have provisions that would apply to transmission line construction or substation upgrades. In addition, SCAQMD recently adopted Rule 2702 Greenhouse Gas Reduction Program as an implementation guideline for Rule 2701 SoCal Climate Solutions Exchange. These rules neither have any requirements nor provisions as this is a voluntary program to encourage greenhouse gas reduction, and to certify the greenhouse gas emission reduction credits. This project encourages greenhouse gas reduction through the interconnection of renewable power to the Los Angeles Load Center, however, certified GHG reduction, per these rules, will not be sought as a part of this project. Therefore, the SCAQMD GHG rules do not directly apply to the project.

3.3.4 Impact Analysis Approach

3.3.4.1 Criteria for Determining Impact Significance

The air quality significance criteria were developed considering the CEQA significance criteria developed by the local air quality districts in the Project area, approved CEQA air quality checklists, and considering other federal criteria. NEPA regulations do not provide specific air quality significance criteria, and the local air quality district CEQA significance criteria is more stringent than the air quality significance criteria generally used in EIS documents (such as the PSD 250 ton/year emission thresholds).

Regional Air Quality Significance Criteria

CEQA allows for the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. The SCAQMD, AVAQMD, and KCAPCD have adoptedestablished regional thresholds of significance for construction activities and for project operations as shown below in Table 3.3-13. As a conservative approach, the most stringent of these standards in each jurisdiction would apply to the proposed Project.

Table 3.3-13. Air Quality Regional Thresholds

Criteria Pollutant	Antelope Valley AQMD		South Coast AQMD		Kern County APCD	
	Construction or Operation		Construction	Operation	Construction or Operation	
	tons/year [1]	lbs/day	lbs/day	lbs/day	Tons/year	lbs/day
Carbon Monoxide (CO)	100	548	550	550	---	---
Oxides of Nitrogen (NOx)	25	137	100	55	25	137 [2]
Particulate Matter (PM10)	15	82	150	150	15	--
Fine Particulate Matter (PM2.5)	---	---	55	55	---	---
Oxides of Sulfur (SOx)	25	137	150	150	27	--
Volatile Organic Compounds (VOC)	25	137	75	55	25	137 [2]

1 – The annual limit is no more restrictive than the daily limit (annual limit is 365 times the daily limit), so the daily limit will be used for impact determination within the AVAQMD jurisdiction.
2 – Indirect vehicle trip emissions only. The Project does not create indirect trip generation, such as a housing project, so the Project does not have the potential to create significant impacts for this KCAPCD significance criteria.
Source: SCAQMD, 2009~~8~~; AVAQMD, 2005; and KCAPCD, 1999.

Localized Air Quality Significance Criteria

In addition to the thresholds provided in Table 3.3-~~14~~13, the SCAQMD recommends~~provides~~ additional localized significance thresholds (LSTs) for toxic air contaminants (TACs), odors, and ambient air quality (see Table 3.3-14).

Table 3.3-14. Localized Significant Thresholds for the South Coast AQMD

Criteria Pollutant	Toxic Air Contaminants (TACs) and Odor Thresholds
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
	Ambient Air Quality for Criteria Pollutants [a]
NO2 1-Hour Average Annual Average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (State) 0.03 ppm (federal)
PM10 - 24-Hour Average	10.4 μg/m^3 (recommended for construction) [b] 2.5 μg/m^3 (operation)
PM2.5 - 24-Hour Average	10.4 μg/m^3 (recommended for construction) [b] 2.5 μg/m^3 (operation)
CO 1-Hour Average 8-Hour Average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (State) 9.0 ppm (State/federal)

Source: SCAQMD, 2008.
Notes: lbs/day = pounds per day; ppm = parts per million; ug/m^3 = micrograms per cubic meter; ≥ greater than or equal to
a. Ambient air quality threshold for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
b. Ambient air quality threshold based on SCAQMD Rule 403.

Specific onsite emission thresholds have been developed for assessment of the LSTs for specific criteria pollutants (NOx, CO, PM10 and PM2.5) within the SCAQMD jurisdiction. These thresholds are determined by Sensitive Receptor Areas (SRAs), ~~for this Project,~~ within the South Coast Air Basin portion of SCAQMD's jurisdiction. The proposed Project and Project alternative construction covers seven separate SRAs (8, 9, 10, 11, 15, 16 and 33). The specific construction emission thresholds, based on the distance to sensitive receptors for these seven~~six~~ SRAs are listed in Table 3.3-15.

Table 3.3-15. Applicable SCAQMD LST Emission Thresholds (lbs/day)

SRA #	Pollutant											
	NOx			CO			PM10			PM2.5		
	Site Acres			Site Acres			Site Acres			Site Acres		
	1	2	5	1	2	5	1	2	5	1	2	5
25 meters to receptor												
8	69	98	148	535	812	1540	4	6	12	3	4	7
9	89	128	203	727	1112	2022	5	7	14	3	5	8
10	118	170	270	576	833	1475	4	6	12	3	4	7
11	83	121	183	673	1031	1814	5	7	14	4	5	9
15	106	152	228	590	877	1644	4	6	12	3	4	6
16	103	147	221	496	724	1246	4	6	11	3	4	6
33	118	170	270	863	1232	2193	5	6	16	4	5	9
50 meters to receptor												
8	69	95	141	783	1125	1921	11	19	37	4	5	9
9	112	151	227	1102	1568	2683	14	22	43	5	7	11
10	148	200	302	858	1279	2033	11	18	36	4	6	9
11	84	118	176	760	1143	1984	13	22	43	5	8	12
15	107	148	219	879	1256	2095	12	19	38	4	5	8
16	104	143	212	637	938	1607	10	17	34	4	6	9
33	148	200	303	1328	1877	2978	14	19	50	6	8	12
100 meters to receptor												
8	81	104	151	1158	1594	2599	27	34	53	7	9	14
9	159	200	286	2233	2852	4294	34	42	63	9	12	17
10	211	263	378	1640	2165	3477	26	33	51	7	10	15
11	96	126	184	1113	1554	2549	29	37	59	9	12	19
15	124	160	233	1294	1787	2922	25	32	52	7	9	13
16	121	156	226	941	1295	2112	24	31	49	9	11	15
33	211	263	378	2423	3218	5188	44	34	80	12	14	21
200 meters to receptor												
8	104	124	166	2229	2785	4119	58	66	85	18	21	27
9	251	284	368	5604	6601	8867	75	84	105	22	26	35
10	334	377	487	4093	4802	6605	57	64	82	18	21	28
11	123	147	202	2110	2660	4024	60	68	91	20	24	34
15	161	190	256	2500	3108	4608	51	59	79	18	20	26
16	159	186	249	1834	2270	3347	53	60	78	20	24	34
33	334	378	486	5691	6778	9611	103	66	140	32	36	45
500 meters to receptor												
8	164	175	208	7270	7957	9857	152	160	180	77	82	93
9	489	513	584	23063	24758	29411	199	207	229	94	100	116
10	652	684	778	17890	19082	22091	148	156	175	75	80	93
11	193	206	245	6884	7530	9342	153	162	186	83	89	104
15	254	271	321	8174	8933	11049	131	139	161	74	80	95
16	252	269	317	6064	6612	8129	137	145	165	74	79	95
33	652	684	778	23065	24768	29410	280	160	322	141	150	170

Source: SCAQMD, 2008.
Values are for 1/2/5 acre active sites and are determined based on the minimum distance from the construction site to sensitive receptors.

The LST thresholds for CO are too high (minimum value of 535 lbs/day) to be exceeded for any given single construction site, so there is no potential for localized CO impacts from the Project construction.

The normal operating emissions will be comprised of inspection and maintenance activities that will not have ~~significant~~ emissions in any one location high enough to create a localized impact. Therefore, only

construction emissions are evaluated with respect to the SCAQMD LSTs, and only for NOx, PM10, and PM2.5 emissions.

Note that ozone is ~~and PM2.5 are~~ not included in Tables 3.3-13, 3.3-14, and 3.3-15. Ozone is not directly emitted from stationary or mobile sources; rather it is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants, specifically oxides of nitrogen (NOx) and hydrocarbons (VOCs). Therefore, it cannot be directly regulated, like its precursors, NOx and VOCs. ~~PM2.5 is not always included in the agency significance criteria as it is currently in the beginning stages of becoming regulated, and as such, thresholds have not yet been developed.~~

Federal General Conformity Significance Criteria

In addition to the regional and local significance criteria, the General Conformity Rule applicability "de minimus" emission levels shown in Table 3.3-16, would apply to the Project areas in federal jurisdiction and control that are in nonattainment of the NAAQS. ~~USFS Counsel has directed that t~~The appropriate area for General Conformity consideration is limited to direct emissions and indirect emissions that: "(1) Are caused by the Federal action, but may occur later in time and/or may be further removed in distance from the action itself but are still reasonably foreseeable; and (2) The Federal agency can practicably control and will maintain control over due to a continuing program responsibility of the Federal agency." (40 CFR §51.852; 40 CFR §93.152)~~actions, occurring within federal jurisdiction, in this case Angeles National Forest, and actions, occurring outside the ANF when directly related to the actions occurring in the ANF, such as transportation of supplies into or waste out of the Project construction areas inside the ANF.~~ Therefore the General Conformity Rule is not applicable to the Kern County portion of the MDAB for this Project, nor portions of project within the SoCAB or Antelope Valley portion of the MDAB that are not constructed on the ANF or USACE lands.

Table 3.3-16. General Conformity Applicability Emission Levels

Area	NOx and VOC ~~and VOC~~ [1]	~~VOC~~	PM10	CO and PM2.5 and SO_2
South Coast Air Basin	25~~10~~ tons/year	~~25 tons/year~~	70 tons/year	100 tons/year
Antelope Valley Portion of MDAB	100~~25~~ tons/year	~~100 tons/year~~	N/A	N/A

1 – The SoCAB and the Antelope Valley Portion of the MDAB have been requested to be ~~are currently being~~ re-classified as extreme and severe nonattainment of the federal 8-hour ozone standard, respectively; however, EPA has not rendered a decision on these requests.
N/A – not applicable.

In addition to the General Conformity de minimus levels provided above, rule applicability is triggered when a project has regionally significant emissions, defined in 40 CFR §93.152 as being 10 percent or more of a nonattainment or maintenance area's emission inventory for that pollutant. The annual emissions from this construction project would be well below 10 percent of the annual emission inventories for all criteria pollutants in the SoCAB or Antelope Valley Portion of the MDAB.

Greenhouse Gas Significance Criteria

The ARB and SCAQMD are working on establishing recommended GHG CEQA significance criteria; however, these efforts are not yet finalized. Additionally, the work being done by ARB and SCAQMD focus on residential and commercial or industrial projects and are not particularly relevant or applicable to large energy or energy infrastructure projects that promote electricity sector-wide GHG emission reductions. Therefore, considering the lack of other responsible state or local agency formalized GHG significance criteria that would be applicable to this type of project, the Lead Agencies have determined that the project would create a significant GHG impact if the project would result in greenhouse gas

emissions that substantially exceed baseline greenhouse gas emissions and that following construction would not impel a regional reduction in GHGs.

Significance Criteria Summary

For this analysis both CEQA checklist criterion and the criterion discussed above were considered to create a list of significance criteria. The Project may result in significant impacts if:

- Criterion AIR1: The Project would generate emissions of air pollutants that would exceed any SCAQMD, AVAQMD, or KCAPCD regional air quality standard as defined in Table 3.3-13.
- Criterion AIR2: The Project would generate emissions of air pollutants that would exceed any SCAQMD localized significance threshold as defined in Tables 3.3-14 and 3.3-15.
- Criterion AIR3: The Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds as defined in Table 3.3-14.
- Criterion AIR4: The Project would result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements.
- Criterion AIR5: The Project would expose a substantial number of people to objectionable odors.
- Criterion AIR6: The Project would conflict with air quality provisions of the Angeles National Forest Strategy.
- Criterion AIR7: The Project would be inconsistent with the current approved Air Quality Management Plans.
- Criterion AIR8: The Project would result in greenhouse gas emissions substantially exceeding baseline greenhouse gas emissions and following construction would not impel a regional reduction in GHGs.

The proposed Project's emissions, specifically the construction dust emissions, could also impact sensitive plant species and create temporary visual impacts; however, implementing mitigation as required to address these criterions will effectively mitigate air quality impacts on biological communities and visual resources.

3.3.4.2 Applicant-Proposed Measures (APMs)

The Applicant-Proposed Measures (APMs) are shown in Table 3.3-17 (SCE, 2007).

Table 3.3-17. Applicant-Proposed Measures – Air Quality

APM AQ-1	Use Ultra-low sulfur diesel fuel (e.g., <15 ppm).
APM AQ-2	Use of clean burning on- and off-road diesel engines. Where feasible, heavy duty diesel powered construction equipment manufactured after 1996 (with federally mandated "clean" diesel engines) would be utilized. (see proposed Mitigation Measure AQ-1b)
APM AQ-3	Construction workers will carpool when possible. (see proposed Mitigation Measure AQ-1a and AQ-1c)
APM AQ-4	Restrict vehicle idling time to less than 10 minutes whenever possible. (see proposed Mitigation Measure AQ-1g)
APM AQ-5	Properly maintain mechanical equipment. (see proposed Mitigation Measure AQ-1f)
APM AQ-6	Use particle traps and other appropriate controls to reduce diesel particulate matter (DPM) where possible. Utilize equipment such as specialized catalytic converters (oxidation catalysts) to control approximately 20 percent of DPM, 40 percent of carbon monoxide, and 50 percent of hydrocarbon emissions. (see proposed Mitigation Measure AQ-1b)
APM AQ-7	Implement feasible fugitive dust control measures as provided in KCAPCD's Rule 402 and AVAQMD and SCAQMD Rule 403. (see proposed Mitigation Measure AQ-1a)
APM AQ-8	As feasible, restrict construction operations during the morning hours and during high wind events when NO_X emissions are more likely to contribute to O_3 formation. (see proposed Mitigation Measure AQ-1a)

Table 3.3-17. Applicant-Proposed Measures – Air Quality	
APM AQ-9	Efficiently schedule staff and daily construction activities to minimize the use of unnecessary/duplicate equipment when possible. (see proposed Mitigation Measure AQ-1c)

Many of these proposed measures do not provide definitive requirements, do not ensure measurable emission reductions, and are not enforceable as written. Hence, some of these measures, as noted in Table 3.3-17, have been replaced and/or rewritten in Mitigation Measures provided in Section 3.3.6.1. APM AQ-1 is now a California regulatory requirement and so does not have to be provided as a mitigation measure.

3.3.4.3 Impact Assessment Methodology

The air quality impacts of the proposed Project are discussed below under subheadings corresponding to each of the significance criterion presented in the preceding section. The analysis describes the impacts of the proposed Project related to air quality and, for each criterion, determines whether implementation of the proposed Project would result in significant impacts.

The operating emissions from the proposed Project and all Project alternatives are comprised of occasional inspection and maintenance activities and no new stationary source operating emission sources will be constructed/operated as part of this Project. ~~The o~~Overhead line inspection and maintenance activities currently occur on the existing transmission lines that this Project would affectively replace, and ~~while~~ some minor new inspection and maintenance activities will occur for the new line segments. Therefore, the proposed Project would create minor incremental operating emissions along new line segments, but not create incremental operating emissions along existing line segments, nor create the potential for significant operating emission impacts. The operating emissions are essentially identical for most of the Project alternatives, as they do not substantially increase in length, but there would be an increase for maintaining the ~~alternative with an~~ underground transmission route associated with Alternative 5. Additionally, a minor increase in emissions is anticipated from unauthorized use of the additional service roads being constructed.

The Project would also indirectly reduce emissions in the SoCAB or elsewhere by reducing the amount of power that would have to be generated using polluting technologies. Not considering the indirect emission reduction of the Project, the normal operating emissions would only include an hour or two of incremental small helicopter use or the use of a crew truck for a few days to conduct line inspection or underground maintenance activities, and these incremental maintenance activities would be well below SCAQMD, AVAQMD, KCAPCD emission significance criteria. A more thorough documentation of the operating emissions is provided under the Impact AQ-2 discussions later in this section.

For the purposes of satisfying CEQA requirements, the significance of each impact is also identified according to the following classifications: Class I: Significant impact; cannot be mitigated to a level that is less than significant; Class II: Significant impact; can be mitigated to a level that is less than significant; Class III: Adverse impact; less than significant; and Class IV: Beneficial impact.

3.3.5 Alternative 1: No Project/Action

Selection of the No Project/Action Alternative would mean that the proposed TRTP would not be implemented. As such, none of the associated Project activities would occur and the environmental impacts associated ~~specifically~~ with the proposed Project would not occur.

The No Project Alternative includes the assumption that existing transmission lines and power plants would continue to operate. The effects that these facilities cause on the existing environment would not change, so no new impacts would occur from continuing operation of the existing transmission lines and power plants. Also, under the No Project Alternative, the proposed TRTP Project would not be constructed, so the impacts associated with construction and operation of the Project would not occur. These impacts avoided would include the adverse impacts from the dust and exhaust emissions caused by construction activities and the beneficial impacts due to the changes in emissions from power plants that could be caused by operation of TRTP.

The first component of the No Project Alternative is the continuation of ongoing demand-side actions, including energy conservation and distributed generation (DG). These actions would result in possible localized air quality impacts as a result of development of DG units by energy consumers. This would be the case if fossil-fuel fired or other combustion or thermal DG technologies become more widespread. For this type of development, local jurisdictions such as cities, counties, and air districts, would need to conduct environmental reviews and issue air quality permits for stationary sources related to these facilities. Increased conservation would not cause any air quality impacts.

The second component of the No Project Alternative is the continuation of supply-side actions, resulting in potentially increased generation within California or increased transmission into California to serve anticipated growth in electricity consumption, specifically within SCAQMD jurisdiction. The impacts of new power plants and new transmission lines could add air pollutants contributing to existing nonattainment conditions or violations of ambient air quality standards, if they occur in areas of substantial existing pollution. Although construction and operation of new power plants and transmission lines may occur, their locations and development schedules cannot be predicted. New generation and construction activities would need to comply with local air quality management requirements and may require local air permit review. Stationary sources that would cause criteria pollutant emissions above regulatory limits would be required to implement the Best Available Control Technology, and if occurring in nonattainment areas, new emissions would need to be offset with emission reductions from the control or shutdown of existing emission sources. These requirements are components of the New Source Review program and the emissions ~~"cap-and-trade"~~ offset programs within SCAQMD which apply to any new major source of emissions. These requirements are effective at minimizing but not eliminating the air quality impacts of new stationary sources of power generation.

The forecast net decrease in emissions from power plants (described ~~in~~later under Impact AQ-7) would not occur with implementation of the No Project Alternative (CAISO, 2008). However, under the No Project/Action Alternative, some currently unknown plan would need to be developed to provide the transmission upgrades necessary to interconnect renewable generation projects in the Tehachapi area and to also address the existing transmission problems south of the Lugo Substation. Similarly, other yet unspecified transmission upgrades would presumably be proposed in the future to provide the needed capacity and reliability to serve growing electrical load in the Antelope Valley and South Coast Air Basin. To interconnect wind projects in the Tehachapi area, it is possible that other electrical utilities with transmission facilities in the area, such as LADWP, might purchase some of the power from Tehachapi area wind developers and integrate it into their system. Another possibility is the development of a private transmission line that could connect wind projects to the electrical grid. Any of these projects, which would occur as a result of the unfulfilled electrical transmission need in the absence of TRTP, are likely to have similar impacts as those identified for the proposed Project. However, if a transmission line were to be constructed in the absence of TRTP that reroutes the transmission outside of the SoCAB or ANF

(such as interconnection to existing lines in the San Joaquin Valley), or was located in a new ROW that is more accessible by paved roads, or ~~and~~ requires fewer or no helicopter tower construction, then such projects having similar power carrying capacity would have the potential to have lower emissions or emissions in other regions than the proposed TRTP Project and potentially have reduced impacts.

3.3.6 Alternative 2: SCE's Proposed Project

3.3.6.1 Direct and Indirect Effects Analysis

Regional Emission Thresholds (Criterion AIR1)

Impact AQ-1: Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds.

Construction of the proposed Project would result in short-term impacts to ambient air quality. Construction is tentatively scheduled for December 2009 to October 2014~~July 2009 to November 2013~~. Temporary construction emissions would result from on-site activities, such as surface clearing, excavation, tower foundation construction, tower steel construction, power cable stringing, substation upgrades, etc.; and from off-site activities such as construction related haul trips, construction worker commuting, and helicopters used for tower construction. Pollutant emissions would vary from day to day depending on the level of activity, the specific operations, and the prevailing weather.

Construction equipment would include machinery such as water trucks, compactors, dump trucks, graders, bulldozers, loaders, cranes, diggers, tension machines, and several types of helicopters (SCE, 2007, 2008). Tables 2.2-11 to 2.2-25 provide the general construction durations, the list of the types of equipment used for each construction activity, and the construction crew requirements for each activity anticipated for the proposed Project. More detailed construction schedule, equipment use, and vehicle trip assumptions are provided in Appendix C. A considerable number of the off-site truck trips are associated with importing concrete and structural steel and exporting wastes from tower demolition.

Air emissions for the proposed Project were calculated using the latest standard calculation methodologies accepted by such agencies as the SCAQMD and incorporating applicant proposed measures, and additional appropriate mitigation measures, such as fugitive dust controls. For on-road and off-road vehicles (except helicopters), SCAQMD CEQA website emission factors for the year 2009 through 2013 (SCAQMD, 2008) were used. Fugitive dust emissions were calculated using the USEPA's AP-42 emission factors (USEPA, 2008~~b~~) and various SCAQMD CEQA Handbook (SCAQMD, 1993) guideline parameters (e.g., silt content, precipitation, etc.) were used as inputs into the USEPA emission factor calculations. Helicopter emission factors are based on values from the FAEED database (FAA, 2001).

Maximum daily and annual emissions are determined by analysis of the Project schedule, and the maximum daily and annual construction emission calculations and assumptions are presented in Appendix C, and a comparison of those emissions with the SCAQMD, AVAQMD, and KCAPCD significance criteria are presented in Table 3.3-18.

Based on the data provided in Table 3.3-18, daily construction emissions would be expected to exceed the Air District Regional planning thresholds for significance for NOx, VOC, CO, PM10, and PM2.5 in the SoCAB and AVAQMD, and in 2010, prior to equipment mitigation, would exceed the annual NOx and PM10 KCAPCD significance criteria.

Table 3.3-18. Alternative 2 Construction Emission/Air District Regional Emission Threshold Comparison

		Emissions (daily – lbs/day, annual - tons/year)					
Jurisdiction		NOx	VOC	CO	PM10	PM2.5	SO_2
SoCAB	Maximum Daily Emissions	1,4652~~7~~	3332~~8~~	1,3152~~93~~	574~~69~~	188~~4~~	10
	Significance Threshold	100	75	550	150	55	150
	Exceeds (YES/NO)	YES	YES	YES	YES	YES	NO
AVAQMD	Maximum Daily Emissions	1,669~~50~~	40~~5~~3	1,506~~493~~	36~~5~~3	13~~8~~6	12
	Significance Threshold	137	137	548	82	--	137
	Exceeds (YES/NO)	YES	YES	YES	YES	~~YES~~--	NO
KCAPCD	2010 Annual Emissions	33.15~~0.98~~	5.26~~00~~	25.93~~13~~	35.72~~41~~	9.49~~25~~	0.05
	Significance Threshold	25	25	--	15	--	27
	Exceeds (YES/NO)	YES	NO	--	YES	--	NO

For the SCAQMD and AVAQMD the major source of the maximum daily NOx, CO, and VOC emissions are from the off-road equipment tailpipe emissions, particularly from the large helicopters required for helicopter based tower construction. The majority of the maximum daily PM10 emissions are from the paved and unpaved road dust emissions due to the long round trip travel distances required to reach the more remote tower construction and helicopter staging area sites. The VOC and CO exceedances in SCAQMD and AVAQMD are directly related to the helicopter construction of towers. Days that would not have helicopter construction activities would not exceed the~~se~~ VOC and CO regional significance thresholds. The NOx and PM emission thresholds would be exceeded for a large portion of the time that major construction activities occur in these two jurisdictions due to the large ground-based vehicle exhaust and fugitive dust emissions for these two pollutants.

For the KCAPCD the major source of emissions during 2010 are the paved and unpaved road travel for PM10 and the off-road equipment, primarily ground based, for NOx.

Implementation of recommended Mitigation Measures AQ-1a through AQ-1j would reduce construction impacts to air quality to the maximum degree feasible but would not eliminate all significant impacts. Mitigation measure AQ-1a will reduce fugitive dust through the reduction of the creation of emissions by stabilizing unpaved road surfaces and using water to bind active soil handling activities among other measures. The most important of the recommended dust mitigation measures is the use of CARB approved or equivalent soil-binders on unpaved roads, parking areas, and staging areas that will provide an estimated 84 percent control of PM10 emissions. The 84 percent value is taken from the CARB website (www.arb.ca.gov/eqpr/mainlist.htm) using the lower value of the fugitive dust control values noted for the two certified dust suppressants. Mitigation measures AQ-1b to AQ-1j would reduce the on-road and off-road construction equipment exhaust emissions to the extent feasible.

Mitigation Measures for Impact AQ-1

AQ-1a **Implement Construction Fugitive Dust Control Plan.** SCE shall develop a Fugitive Dust Emission Control Plan (FDECP) for construction work. The Plan shall be completed prior to construction and approved by the CPUC and FS. This Plan is in addition to any fugitive dust control plan required by the South Coast Air Quality Management District (SCAQMD). Measures to be incorporated into the plan shall include, but are not limited to the following:

- Non-toxic soil binders, equivalent or better in efficiencies than the CARB approved soil binders, shall be applied per manufacturer recommendations to active unpaved roadways, unpaved staging areas, and unpaved parking area(s) throughout construction to reduce fugitive dust emissions. On NFS lands, SCE shall obtain FS approval of any soil binders to be used.

- Unpaved road travel will be limited to the extent possible~~,~~ by; limiting the travel of heavy equipment in and out of the unpaved areas (move from construction site to construction site rather than back to marshalling or staging areas daily); ~~and~~ through carpooling/busing construction workers to the maximum feasible extent;~~.~~ and by developing travel routes to each construction site that minimize unpaved road travel to the extent possible, according to FS or other regulatory agency road use restriction. The FDECP will include a road travel plan applicable for construction sites with unpaved access greater than one mile.
- Water the disturbed areas of the active construction sites at least three times per day and more often if uncontrolled fugitive dust is noted.
- Enclose, cover, water twice daily, and/or apply non-toxic soil binders according to manufacturer's specifications to exposed piles with a five percent or greater silt content.
- Maintain unpaved road vehicle travel to the lowest practical speeds, and no greater than 15 miles per hour (mph), to reduce fugitive dust emissions.
- All vehicle tires shall be inspected, are to be free of~~r~~ dirt, and washed as necessary prior to entering paved roadways.
- Install wheel washers or wash the wheels of trucks and other heavy equipment where vehicles exit unpaved access to the construction sites~~the site~~.
- Cover all trucks hauling soil and other loose material, or require at least two feet of freeboard.
- Establish a vegetative ground cover (in compliance with biological resources impact mitigation measures) or otherwise create stabilized surfaces on all unpaved areas at each of the construction sites within 21 days after active construction operations have ceased.
- Increase the frequency of watering, if water is used as a soil binder for disturbed surfaces, or implement other additional fugitive dust mitigation measures, to all active disturbed fugitive dust emission sources when wind speeds (as instantaneous wind gusts) exceed 25 mph.
- ~~Travel routes to each construction site shall be developed to minimize unpaved road travel.~~

SCAQMD Rule 403 Best Available Control Measures (BACM) are required to be proposed in the FDECP and implemented when and if the BACM are as strict or stricter than the control measures listed above. Additionally, mitigation measures provided on the SCAQMD CEQA website Tables ~~I~~XI-A through ~~I~~XI-E (http://www.aqmd.gov/ceqa/handbook/mitigation/fugitive/MM_fugitive.html or as updated by SCAQMD) must be implemented in the FDECP where applicable. This mitigation measure covers construction work performed within all three local air quality jurisdictions.

AQ-1b Off-road Diesel-fueled Equipment Standards. All off-road construction diesel engines not registered under CARB's Statewide Portable Equipment Registration Program, which have a rating of 50 horsepower (hp) or more, shall meet, at a minimum, the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, section 2423(b)(1) unless that such engine is not available for a particular item of equipment. In the event a Tier 2 engine is not available for any off-road engine larger than 50 hp, that engine shall have tailpipe retrofit controls that reduce exhaust emissions of NOx and PM to no more than Tier 2 emission levels. Tier 1 engines will be allowed on a case-by-case basis only when the Project owner has documented that no Tier 2 equipment or emissions equivalent retrofit equipment is available for a particular equipment type that must be used to complete the Project's construction. This shall be documented with signed written correspondence by the appropriate construction contractor along with documented correspondence with at least two construction equipment rental firms. Equipment properly registered under and in compliance with CARB's Statewide Portable Equipment Registration Program are in compliance with this mitigation measure.

AQ-1c **Limit Vehicle Traffic and Equipment Use.** Construction worker carpooling will be encouraged and other vehicle trips and equipment use will be limited to the extent practical by efficiently scheduling staff and daily construction activities to minimize the use of unnecessary/duplicate equipment when possible.

AQ-1d **Heavy Duty Diesel Haul Vehicle On-road Equipment Standards.** Require the use of 2006 engines or pre-2006 engines with CARB certified Level 3 diesel emission controls for all on-road heavy duty diesel haul vehicles that are contracted on a continuing basis for use to haul equipment and waste for the Project.

AQ-1e **On-road Vehicles Standards.** All on-road construction vehicles, other than those meeting the requirements of Mitigation Measure AQ-1d (Heavy Duty Diesel Haul Vehicle On-road Equipment Standards), shall meet all applicable California on-road emission standards and shall be licensed in the State of California. This does not apply to construction worker personal vehicles.

AQ-1f **Properly Maintain Mechanical Equipment.** The construction contractor shall ensure that all mechanical equipment associated with Project construction is properly tuned and maintained in accordance with the manufacturer's specifications.

AQ-1g **Restrict Engine Idling to 5 Minutes.** Diesel engine idle time shall be restricted to no more than 5 minutes. Exceptions are vehicles that need to idle as part of their operation, such as concrete mixer trucks.

AQ-1h **Schedule Deliveries Outside of Peak Traffic Hours.** All material deliveries to the marshalling yards and from the marshalling yards to the construction sites shall be scheduled outside of peak traffic hours (6:00 to 9:30 am and 3:30 to 6:30 pm) to the extent feasible, and other truck trips during peak traffic hours shall be minimized to the extent feasible.

AQ-1i **Off-road Gasoline-fueled Equipment Standards.** As practicable, all off-road stationary and portable gasoline powered equipment shall have EPA Phase 1/Phase 2 compliant engines, where the specific engine requirement shall be based on the new engine standard in affect two years prior to the initiating Project construction. In the event that EPA Phase 1/Phase 2 compliant engines are determined not to be practicable, SCE shall provide documentation to the CPUC and FS with an explanation.

AQ-1j **Reduction of Helicopter Emissions.** Helicopter use will be limited to the extent feasible and helicopters with low emitting engines shall be used to the extent practical.

As noted the emission estimates include the recommended fugitive dust mitigation measures, but the off-road equipment emissions assume fleet average emissions for the SCAQMD off-road fleet. The implementation of Mitigation Measure AQ-1b would reduce the off-road equipment engine emissions; however, the exact amount cannot be easily calculated as the final extent of the use of higher Tier engines cannot be reasonably estimated. However, an analysis of the 2009 SCAQMD off-road emission factors indicates that the fleet average engine for the equipment types assumed to be used for this Project would be just better than Tier 1 on average. SCAQMD's CEQA website provides assumptions for the mitigation potential for the use of higher tier off-road engines, which are as follows:

Percentage Reduction From Tier 1 to Tiers 2, 3, & 4									
Engine	Tier 1 to Tier 2			Tier 1 to Tier 3			Tier 1 to Tier 4		
Size (hp)	NOx	ROG	PM	NOx	ROG	PM	NOx	ROG	PM
75 - 99	23%	76%	46%	52%	85%	46%	64%	88%	97%
100 - 174	33%	70%	28%	59%	82%	28%	64%	83%	95%
175 - 299	33%	76%	63%	59%	85%	63%	78%	86%	96%
300 - 600	34%	76%	63%	59%	85%	63%	78%	86%	96%

Source: SCAQMD 2008

Note: Reductions in Reactive Organic Gases (ROG) would be relatively comparable to reductions in Volatile Organic Compounds (VOC).

While significant reductions in off-road ground-based emissions may occur with the implementation of recommended Mitigation Measure AQ-1b, those reduction are still not enough to change the regional emissions significance findings, due to the significant helicopter and fugitive dust emissions contributions that remain after mitigation, with the exception of NOx emissions within the KCAPCD jurisdiction that should be reduced below the 25 tons per year significance threshold with the implementation of the recommended mitigation measures (specifically AQ-1b).

The use of emission offsets to further mitigate the significant maximum daily construction emissions in SCAQMD and AVAQMD and the 2010 PM10 emissions in KCAPCD are not considered feasible, due to lack of availability of such offsets and their prohibitive cost.

CEQA Significance Conclusion

The proposed Project's NOx, CO, VOC, PM10 and PM2.5 emissions, even after implementation of all feasible mitigation measures listed above, will remain above the SCAQMD and AVAQMD daily significance thresholds (except for PM2.5 where there is no threshold recommended by AVAQMD) and the proposed Project's PM10 emissions will remain above the KCAPCD annual significance threshold values. Therefore, the daily regional and annual emissions from the proposed Project would cause significant and unavoidable impacts (Class I) in these three jurisdictions.

Impact AQ-2: Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds.

Operation and maintenance of the proposed Project would result in short-term direct and indirect impacts to ambient air quality. The Project direct operating emissions are comprised of increased inspection and maintenance activities. Recently regulated increases in inspection and maintenance actions that are not directly related to the Project are not considered Project incremental operations. The incremental operations assumptions due to the Project and the resulting emission estimates are provided Appendix C.

Direct operating emissions for the proposed Project were calculated using the latest standard calculation methodologies accepted by such agencies as the SCAQMD. For on-road and off-road vehicles, SCAQMD CEQA website emission factors for the year 2013 (SCAQMD, 2008) were used. Fugitive dust emissions were calculated using the USEPA's AP-42 emission factors (USEPA, 2008~~b~~) and various SCAQMD CEQA Handbook (SCAQMD, 1993) guideline parameters (e.g., silt content, precipitation, etc.) were used as inputs into the USEPA emission factor calculations. Helicopter emission factors are based on values from the FAEED database (FAA, 2001).

A comparison of the incremental direct operating emissions with the SCAQMD, AVAQMD, and KCAPCD significance criteria are presented in Table 3.3-19.

Table 3.3-19. Alternative 2 Operating Emission/Air District Regional Emission Threshold Comparison

Jurisdiction		Emissions (daily – lbs/day, annual - tons/year)					
		NOx	VOC	CO	PM10	PM2.5	SO_2
SCAQMD	Maximum Daily Emissions	4~~8~~6	7	2~~7~~5	61	19	0.1
	Significance Threshold	55	55	550	150	55	150
	Exceeds (YES/NO)	NO	NO	NO	NO	NO	NO
AVAQMD	Maximum Daily Emissions	4~~6~~4~~4~~	7~~6~~	2~~4~~2~~3~~	57	21	0.1
	Significance Threshold	137	137	548	82	--	137
	Exceeds (YES/NO)	NO	NO	NO	NO	NO	NO
KCAPCD	2013 Annual Emissions	0.42~~0~~	0.06	0.25~~4~~	0.67	0.23~~2~~	0.00
	Significance Threshold	25	25	--	15	--	27
	Exceeds (YES/NO)	NO	NO	--	NO	--	NO

The emissions caused directly by operation, maintenance, and inspection of the proposed Project are shown above in Table 3.3-19 to be below all applicable regional daily and annual emission thresholds. The emissions show that the proposed Project would not result in significant direct operational emissions within any jurisdiction. Therefore, direct operational impacts of the proposed Project would not conflict with any air quality management plan.

Project indirect emissions are comprised of the Project's impact on the transmission grid and operation of existing and forecast power plants. The indirect emissions for the proposed Project have not been calculated by CAISO, but it is assumed that the indirect emission reductions from the displacement of fossil-fuel fired power plant emissions are higher than the maximum daily direct emission increases and much high than the annual direct emission increase from the limited inspection and maintenance activities required to maintain the new transmission lines and associated facilities.

CEQA Significance Conclusion

The Project's direct operating emissions are minor and would therefore not conflict with any air quality management plans and would have a less-than-significant impact (Class III) in all jurisdictions. Additionally, the proposed Project's transmission of renewable energy is assumed to help facilitate~~impel~~ an indirect emission decrease and an overall emissions decrease. Therefore, the operations of the proposed Project would provide a beneficial operating emissions impact (Class IV).

SCAQMD Localized Significance Thresholds (Criterion AIR2)

Impact AQ-3: Construction of the Project would expose sensitive receptors to substantial pollutant concentrations.

Most of the construction routes traveling through the MDAB south through the SoCAB to the ANF southern border are in fairly remote areas that would not affect substantial numbers of sensitive receptors. The portion of the route within the MDAB, with the exception of the Quartz Hills and Desert View Highlands areas, has a very low residential population and there are no schools or other known sensitive receptors located near (within 500 meters) any of the construction sites within the MDAB. The closest residences to the Antelope Valley Substation are more than 150 meters (492 feet) away. Due to the lack of sensitive receptors, their distance from each construction site, the mitigation measures recommended under Impact AQ-1, and the relatively low amount of emissions that would occur at each tower construction site at any given time, and the lower background concentrations (i.e. better air quality than

SoCAB), the impacts to sensitive receptors located in the MDAB are determined to be less than significant.

The construction route for the proposed Project traverses SCAQMD Source Receptor Areas (SRAs) 8, 9, 10, 11, 15, 16 and 33. Most of the tower construction sites within SRA 15 are remote; however, there are many areas of the construction route or substation construction that will be located near residences, schools, or other sensitive receptors. The SCAQMD Localized Significance Thresholds (LSTs) in lbs/day are provided in Table 3.3-15 for conservative Project area sizes and distances to receptors for each of the SRAs crossed by the proposed Project.

To be conservative it is assumed that the route is within 25 meters of residences for all of the SRAs except SRA 15 where the closest residence is located within 100 meters. For substations within the SoCAB undergoing construction for this Project the distance to nearest sensitive receptor are as follows: Mira Loma - SRA 33 within 100 meters (residences – new development north of the substation); Mesa - SRA 11 within 300 meters (residences); Rio Hondo - SRA 9 500 meters (park); Gould - SRA 8 within 100 meters (residences). For marshalling areas, to be conservative due the locations of these areas being currently unknown, it is assumed sensitive receptors are located within 25 meters. Table 3.3-20 compares the worst-case daily on-site emissions from the marshalling yards, tower construction, and substation construction sites to the emission thresholds presented in Table 3.3-15. It is assumed that the marshalling areas and the tower construction sites are two acres and one acre, respectively, are therefore comparable with the two acre and one acre site LST thresholds (conservative assumption), while the substation improvement work is limited to small areas on each substation assumed to be one acre.

Table 3.3-20. Alternative 2 Localized Impact Emissions Comparison

	NOx	PM10	PM2.5
Marshalling Area Construction Emissions (2-acres)	5	1	0.5
Localized Significance Threshold (25 meters)	98	6	4
Exceeds (YES/NO)	NO	NO	NO
Tower Construction Emissions (1-acre)	47	6.5	3.5
Localized Significance Threshold (25 meters)	69	4	3
Exceeds (YES/NO)	NO	YES	YES
Substation Construction Emissions (12 acres)	14	1	1
Localized Significance Threshold (50 meters)	69	11	4
Exceeds (YES/NO)	NO	NO	NO

The PM emission estimates shown in Table 3.3-20 are limited to the on-site emission sources only and do not include all of the unpaved road travel needed to get to personnel and materials to the tower sites and do not include the road construction emissions which do not occur at a single site but rather over a one-half mile stretch of road per day. Additionally, helicopter emissions are not included as they are not ground level emissions, with the exception of the helicopter construction staging areas that are not separately evaluated as they are not known to be located within 500 meters of any sensitive receptors.

As can be seen in Table 3.3-20, site specific construction emissions of PM10 and PM2.5 emissions would have the potential to exceed the localized significance criteria during tower construction activities when those towers are located 25 meters, but less than 50 meters, from a receptor (please see Table 3.3-15 that shows that the 50 meter LST values are not exceeded).

The onsite construction emissions are estimated, after implementation of Mitigation Measures AQ-1a for fugitive dust control, but do not explicitly include all of the control gained for measures AQ-1b to AQ-1j, as appropriate, to control off-road and on-road equipment emissions to mitigate Impact AQ-1 to the maximum feasible extent. The mitigation measures for Impact AQ-1 mitigate construction emissions to the maximum feasible extent, so no additional mitigation is recommended for this impact.

CEQA Significance Conclusion

Construction of the Project would cause localized emissions above the SCAQMD LST thresholds even after mitigating to the maximum feasible extent; therefore, ~~the~~ Project construction ~~operation~~ would have a significant and unavoidable impact (Class I) to local sensitive receptors that are located within 50 meters of a new tower construction site.

Impact AQ-4: Operation of the Project would expose sensitive receptors to substantial pollutant concentrations.

Operations of the proposed Project would result in short-term direct and indirect impacts to ambient air quality. The Project direct operating emissions are comprised of increased inspection and maintenance activities. As shown in Table 3.3-19 the direct maximum daily operating emissions are minimal and the Project is assumed to create an indirect emission reduction. Additionally, the operating emissions occur over a large area as a result of non-stationary activities such as line inspection and road maintenance so that a significant amount of normal operating emissions would not occur in any single location in quantities that could approach the SCAQMD LST thresholds.

CEQA Significance Conclusion

Operation of the Project would not cause localized emissions above the SCAQMD LST thresholds; therefore, the Project operation would have a less-than-significant impact (Class III) to local sensitive receptors.

Air Toxic Contaminant Emissions (Criterion AIR3)

Impact AQ-5: Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds.

While the construction of the proposed Project would generate large quantities of criteria pollutant emissions as shown in Table 3.3-18 and Appendix C, the Project covers a very large area and does not generate large quantities of emissions at any one site, such as a major stationary source, nor does it generate large quantities of toxic air contaminants, with the potential exception of diesel particulate matter (DPM). Additionally, the Project's construction occurs over a limited period of time that would further reduce the long term chronic exposures (carcinogenic and non-carcinogenic exposures) to DPM and other air toxic contaminants. Therefore, the risk from Project construction at any given receptor area would be well below the SCAQMD significance thresholds. Operation emissions of toxic air contaminants are negligible and as noted previously the Project would result in an indirect net emission decrease that would lower risk from toxic air contaminants.

CEQA Significance Conclusion

In summary, the proposed Project's toxic air contaminant emissions would not exceed SCAQMD risk thresholds so the Project would have less-than-significant (Class III) health risk impacts.

Federal General Conformity Rule (Criterion AIR4)

Impact AQ-6: The Project would not conform to Federal General Conformity Rules.

The proposed Project would result in significant impacts if the Project were to cause annual emissions that exceed the General Conformity de minimus thresholds and the Project cannot be shown to conform to the SIP. Based on the current proposed Project schedule, the Project's maximum annual ANF related construction emissions would occur in 2010 or 2011 in the South Coast Air Basin, and in 2012 in the AVAQMD portion of the Mojave Desert Air Basin. The project's maximum annual construction related emissions within USACE land would occur in 2011 in the South Coast Air Basin. The estimated annual ANF and USACE related emissions in the SoCAB and the ANF related emissions in the AVAQMD portions of the MDAB compared to the respective General Conformity de minimus thresholds are provided in Table 3.3-21.

Table 3.3-21. Alternative 2 Emissions/General Conformity Emissions Threshold Comparison

		Emissions (Tons/year)					
Air Basin		NOx	VOC	CO	PM10	PM2.5	SO_2
SoCAB	~~2009 Emissions~~Angeles National Forest – 2009	0.8~~7~~	0.1	0.7~~6~~	1.6	0.4~~3~~	0.0
	USACE – 2009	---	---	---	---	---	---
	Total Federal Land 2009	0.8	0.1	0.7	1.6	0.4	0.0
	~~2010 Emissions~~Angeles National Forest – 2010	20.0~~18.9~~	3.1~~2.9~~	15.2~~14.5~~	15.0~~3~~	4.1~~2~~	0.1
	USACE – 2010	3.8	0.6	2.6	2.5	0.7	0.0
	Total Federal Land 2010	23.8	3.7	17.8	17.5	4.8	0.1
	~~2011 Emissions~~Angeles National Forest – 2011	18.7~~7.5~~	3.1~~2.9~~	15.3~~14.4~~	21.0~~21.8~~	5.0~~2~~	0.1
	USACE – 2011	4.6	0.8	3.7	2.6	0.7	0.0
	Total Federal Land 2011	23.3	3.9	19.0	23.6	5.7	0.1
	~~2012 Emissions~~Angeles National Forest – 2012	10.8~~1~~	2.0~~1.9~~	9.1~~8.6~~	12.7~~6.0~~	3.2~~8~~	0.0
	USACE – 2012	2.2	0.4	1.9	1.2	0.3	0.0
	Total Federal Land 2012	13.0	2.4	11.0	13.9	3.5	0.0
	~~2013 Emissions~~Angeles National Forest – 2013	0.1	0.0	0.1~~0~~	0.0	0.0	0.0
	USACE – 2013	---	---	---	---	---	---
	Total Federal Land 2013	0.1	0.0	0.1	0.0	0.0	0.0
	Applicability Trigger	25~~10~~ [a]	25~~10~~	100	70	100	100
	Exceeds (YES/NO)	NO~~YES~~	NO	NO	NO	NO	NO
MDAB AVAQMD	2009 Emissions	0.6	0.1				
	2010 Emissions	3.9~~5~~	0.6~~5~~				
	2011 Emissions	3.3~~0~~	0.6~~5~~				
	2012 Emissions	14.0~~3.3~~	2.6				
	2013 Emissions	0.0	0.0				
	Applicability Trigger [b]	100~~25~~	100~~25~~				
	Exceeds (YES/NO)	NO	NO				

Table Notes:
- a- NOx emission trigger as a PM2.5 precursor is 100 tons/year.
- b- Antelope Valley portion of the MDAB.

Table 3.3-21 shows that the proposed Project's estimated construction emissions are less than the General Conformity applicability thresholds for the SoCAB and the AVAQMD portion of the MDAB. ~~and over the thresholds for NOx for the SoCAB.~~ The annual emissions calculations and assumptions are provided in Appendix C. The proposed Project's emission estimate considers the implementation of Mitigation Measures AQ-1a, but are conservative as they do not fully consider implementation of Mitigation Measures AQ-1b through AQ-1j. ~~However, the level of the exceedance of these thresholds indicates that full implementation of these mitigation measures would not mitigate emissions below the NOx General Conformity applicability thresholds during 2010 and 2011.~~ A complete conformity analysis is only required for projects that exceed the General Conformity applicability thresholds. ~~The proposed Project's estimated emissions have been determined to be above the General Conformity applicability thresholds; therefore, a complete conformity analysis on the selected Project alternative will be performed as required by statute and approved before the Record of Decision (ROD) is approved for this Project.~~

~~The following mitigation measure is recommended to mitigate this impact to less than significant (Class II) and provide assurance that the Project will comply with the General Conformity Rule and be shown to conform to the SIP.~~

~~Mitigation Measure for Impact AQ-6~~

~~AQ-6 **General Conformity Emission Offset Mitigation.** In the event that the final emission estimate for the selected Project alternative as provided in the Project's Conformity Analysis exceeds the NOx and/or VOC emission applicability thresholds, and assuming the SCAQMD does not provide confirmation that the Project's emissions are accounted for in the State Implementation Plan (SIP) emission estimates per 40 CFR §93.158(a)(1), then the Project will obtain emission reduction credits to fully offset the NOx and/or VOC emissions per 40 CFR §93.158(a)(2) for the years that the Project has been estimated to exceed the NOx and/or VOC emission applicability thresholds. Credits shall be submitted to the CPUC and FS for review and approval.~~

CEQA Significance Conclusion

~~With the incorporation of the air quality Mitigation Measure~~ The proposed Project's annual emissions would be below the General Conformity de minimus limits and are well below the 10 percent of the non-attainment area annual emission inventories; therefore, the proposed ~~AQ-6 the~~ Project ~~would be found to be in conformity of the SIP and the Project~~ would have less-than-significant (Class III) impacts for Impact AQ-6.

Odors (Criterion AIR5)

Impact AQ-7: The Project would create objectionable odors.

Construction equipment and equipment used during construction operations, such as the potential for small areas of asphalt paving (minor hot or cold mix patching); and the operations maintenance/inspection equipment may create mildly objectionable odors. The specific potential minor odor sources during construction would include equipment exhaust, asphalt patching, and portable toilet facilities for workers. During operations maintenance/inspection the minor odors sources would generally be limited to vehicle exhausts. These odors would be temporary and would not affect a substantial number of people. No mitigation measures for odor reduction are necessary for this Project.

CEQA Significance Conclusion

The odor impacts from the proposed Project's construction and operation would be less than significant (Class III).

Angeles National Forest Strategy Conformance (Criterion AIR6)

Impact AQ-8: The Project would not conform to Angeles National Forest air quality strategies.

The Angeles National Forest Strategy does not include any air quality strategies that would be significantly impacted by the construction or operation of the proposed Project. The Angeles National Forest air quality strategies are limited to the following:

- AIR 1: Minimize Smoke and Dust
- AIR 2: Forest Air Quality Emissions

The Angeles National Forest strategy AIR 1 is very general and is directed to "Control and reduce fugitive dust to protect human health, improve safety and moderate or eliminate environmental impacts." The only action item of this of this strategy is to "Incorporate visibility requirements into project plans." The proposed Project construction smoke and dust would be reduced through conformance with SCAQMD and AVAQMD fugitive dust rules and additionally mitigated to the extent feasible by the additional mitigation measures listed for Impact AQ-1, including the requirement for a construction fugitive emission control plan (Mitigation Measure AQ-1a).

The Angeles National Forest air quality strategy AIR 2 relates to providing an air quality inventory for prescribed burns and wildfires and therefore does not directly relate to the proposed Project's construction and operation emissions. The proposed Project's fire safety requirements are addressed separately in Section 3.16.

CEQA Significance Conclusion

With the incorporation of the air quality Mitigation Measures AQ-1a through AQ-1j, the air quality strategy would be compliant with ANF air quality strategies and the Project impacts would be less than significant (Class II).

Conformance with Applicable Air Quality Management Plans (Criterion AIR7)

Impact AQ-9: The Project would not conform with applicable Air Quality Management Plans.

The proposed Project and all alternatives would be constructed in compliance with applicable federal, State, and local requirements. Additionally, the Project construction mitigation measures (AQ-1a through AQ-1j) required to mitigate regional emission impacts to the extent feasible were developed after consulting SCAQMD personnel to confirm mitigation measures that would be consistent with SCAQMD approved Air Quality Management Plans. The operating emissions would be comprised of minimal inspection and maintenance activities that would not significantly impact air quality and the Project would not directly or indirectly cause any population growth that is not considered in the current approved air quality plan. The mitigation measures specifically required to comply with the SCAQMD AQMP proposed emission reduction measures are as follows: AQ-1a (Implement Construction Fugitive Dust Control Plan), AQ-1b (Off-road Diesel-fueled Equipment Standards), and AQ-1d (Heavy Duty Diesel Haul Vehicle On-road Equipment Standards).

CEQA Significance Conclusion

After mitigation the Project would be consistent with the currently approved Air Quality Management Plans and would have a less-than-significant impact (Class II).

Climate Change Impacts (Criterion AIR8)

Impact AQ-10: Emissions would contribute to climate change.

The proposed Project would cause greenhouse gas (GHG) emissions during the short-term duration of Project construction. The GHG emissions are estimated using a California Climate Action Registry General Reporting Protocol emission factors for fuel use (CCAR 2007). The emission estimate includes the truck transport emissions to the site from the last major shipping terminal (port, rail yard, etc.) but does not include rail or ship transport of cable, steel, electrical equipment, etc.

The GHG emissions estimated for construction activities are provided in Table 3.3-22 with the calculations and assumptions provided in Appendix C.

Table 3.3-22. Alternative 2 Construction GHG Emission Estimate

Emission Source~~Year~~	CO_2e ~~-eq~~ Emissions (tonnes/year)
Construction Equipment	33,206
SF_6 Leaks	21,597 ~~24.035~~
Total	54,803 ~~57,187~~

During operation of the Project, minor quantities of direct long-term greenhouse gas emissions, in the form of additional SF_6 equipment leak emissions would occur from the proposed Project. Inspection and maintenance activities would also cause a small increase in GHG emissions.

The indirect GHG emissions decrease that would result from the Project has been calculated, using an SCE estimate of the renewable energy enabled by the Project, to be approximately 3,200,000 tonnes per year and the eGRID estimate (USEPA 2007) of CO_2e ~~-eq~~ emissions per MWh in the SCE service area (see Appendix C). This shows that the Project's construction and operating GHG emission increases would be more than offset by the Project providing greater renewable energy transmission and providing improved transmission effectiveness and efficiency.

The estimated annual direct and indirect operational GHG emissions are provided in Table 3.3-23 with the calculations and assumptions for the direct operating emissions provided in Appendix C.

Table 3.3-23. Alternative 2 Direct and Indirect Operating GHG Emission Estimate

Activity	CO_2e ~~-eq~~ Emissions (tonnes/year)
SF_6 Leaks	8,639 ~~9,614~~
Inspection/Maintenance	86
Total Direct	8,725 ~~9,700~~
Indirect Emissions	(-3,175,570)
Total Direct and Indirect Emissions	(-3,166,845~~5,870~~)

Demand for electricity would not change as a result of the proposed Project, and power generated by power plants (renewable, fossil-fueled, large hydro, etc.) in response to the demand would occur at some location regardless of whether the proposed Project is approved or disapproved. In this way, by increasing the use of renewable energy and improving the distribution efficiency of the California transmission grid, the proposed Project would partially implement one of the IPCC key strategies for mitigating climate change.

CEQA Significance Conclusion

The Project's direct operating GHG emissions are minor and the Project would create a substantial indirect emission decrease that, even considering the Project's construction GHG emissions, would create an overall GHG emissions decrease over the Project's life. Additionally, the Project's purpose would implement key strategies for mitigating climate change proposed by the California Energy Commission and the IPCC to improve transmission and increase renewable energy use. Therefore, the Project would provide a beneficial GHG emissions impact (Class IV).

3.3.6.2 Cumulative Effects Analysis

Geographic Extent

For Air Quality, the potential geographic extent of the cumulative impact area covers two air basins, two counties, and three local air quality jurisdictions. Cumulative impacts could extend over the entire Project route. However, the identification of cumulative projects for air quality generally ranges from within one mile of a proposed Project to as far as six miles or more from a proposed Project. The effect of downwind dispersion eliminates the potential for Project level significant cumulative air quality impacts over areas larger than a few miles.

Since the proposed Project has very minor direct operating emissions and a net decrease considering direct and indirect emissions, the cumulative impact discussion is focused on construction impacts. Construction impacts are localized and of short duration. Therefore, only projects within one mile of the Project route, as well as projects that could impact traffic during the Project construction are considered projects that could, with the proposed Project, cause cumulative impacts. Additionally, only projects that are scheduled concurrently in the same area as the proposed Project are considered as projects that could contribute to cumulative impacts.

Existing Cumulative Conditions

The proposed Project area covers three air quality jurisdictions that have varying pollutant attainment/nonattainment classifications, as provided in Section 3.3. Long-term trends in reduced emissions of most criteria pollutants have generally reduced criteria pollutant concentrations; however, those trends have flattened in recent years and over the past ten years only one significant change in attainment status has occurred (SoCAB attained State and Federal CO standards). Therefore, any increase in emissions of nonattainment pollutants and precursors would cause an adverse Air Quality impact.

Reasonably Foreseeable Future Projects and Changes

Only those projects listed in Section 2.9 (Cumulative Projects) and shown in Figures 2.9-1a through 2.9-1d (located at the end of Chapter 2), that have been identified within one mile of the proposed Project and that have the potential for temporally overlapping emissions with the proposed Project are considered potential cumulative projects. There are a large number of projects listed in Section 2.9 and shown in Figures 2.9-1a through 2.9-1d that are within one mile of the Project route. However, the construction schedule of many of these projects is uncertain, so there is the potential that a number of these projects will not have construction periods coincident with that of the proposed Project.

Cumulative Impact Analysis

Since the proposed Project would have very minor operating emissions, the cumulative impact analysis focuses on construction impacts, which are localized and of short duration. Therefore, only projects

within one mile of the Project route, as well as projects that could impact traffic during construction of the proposed Project are considered for analysis of cumulative impacts. Additionally, only new projects with construction or operating emissions that would occur at the same time as the proposed Project's construction are considered as part of this cumulative impact analysis; existing emission sources are considered part of the existing ambient background cumulative condition. A large number of projects within one mile of the proposed or alternative Project routes are listed in Section 2.9 and shown in Figures 2.9-1a through 2.9-1b; however, the construction schedules of many of these projects is uncertain, making it possible that construction of many of these projects would not occur coincident with and within one mile of the construction of the proposed Project. Should construction activities from related projects within one mile of the proposed transmission route occur concurrent with construction of the proposed Project, cumulative Air Quality impacts could occur.

- **Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-1).** Construction activities associated with the proposed Project would result in air emissions that exceed the SCAQMD, AVAQMD, and KCAPCD regional emission thresholds for selected pollutants (see Table 3.3-18). For cumulative assessment purposes the potential existence of nearby concurrent cumulative projects would only add to these significant emission totals. The cumulative project list (Section 2.9 and Figures 2.9-1a through 2.9-1d) shows four projects within one mile of the proposed Project route in KCAPCD jurisdiction, shows five projects within one mile of the proposed Project route in AVAQMD jurisdiction, and shows eighteen projects within one mile of the proposed Project route in SCAQMD jurisdiction. Given the assumption that any of these projects~~, other currently unknown projects,~~ would be constructed concurrently with TRTP in the SCAQMD, AVAQMD, and KCAPCD jurisdictions then the proposed Project would have cumulatively significant impacts in those jurisdictions. Therefore, the combined effect of construction emissions from the proposed Project and construction of other projects ~~construction~~ and/or operating emissions would be cumulatively significant at various times during construction (Class I).
- **Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-2).** Direct operating emissions for the Project are very minimal and would occur over a large area and would not cumulatively have the potential to exceed SCAQMD, AVAQMD, and KCAPCD emission significance thresholds (see Table 3.3-19). Indirectly the Project would reduce operating emissions. Therefore, the Project's operation would have a less-than-significant cumulative regional impact (Class III).
- **Construction of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-3).** Construction activities associated with the Project would expose sensitive receptors in the populated areas along the construction route. The SCAQMD Localized Significance Threshold (LST) lookup tables used to determine Project significance do not apply to cumulative project evaluation; however, the significance criteria is based on downwind pollutant concentrations causing a new exceedance (NOx and CO) of an air quality standard, substantially increasing current exceedances (PM10 and PM2.5) of an air quality standard, and these general criteria are applicable standards for localized impact cumulative project analysis. For the emissions of any two projects to have the potential for significant cumulative downwind concentrations, they must both be in close proximity to limit the downwind dispersion from one site to the other and generally one of the projects must be able to cause an air quality standard exceedance on its own (conservation of mass principles dictate that two exhaust plumes of stable criteria pollutants do not add concentration, they mix concentration with the plume of highest concentration being diluted by the plume with the lower concentration). Therefore, it can be assumed that the potential for cumulative impacts to sensitive receptors is the same as the Project impacts to sensitive receptors, so the proposed Project would have cumulative significant impacts to sensitive receptors after mitigation (Class I).
- **Operation of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-4).** Direct operating emissions for the Project are minimal and not very localized, and indirectly the Project would reduce operating emissions. Since the proposed Project's operation will have minimum direct localized operating emissions and the project will help create an overall net emission decrease, it will have a less-than-significant cumulative localized impact to sensitive receptors (Class III).
- **Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds (Impact AQ-5).** Construction activities associated with the Project do not

have large amounts of toxic air contaminant emissions, are of short duration, and do not have significant emissions in any single area that could create a significant risk to local populations. Similarly, the cumulative projects construction would not be expected to have significant emissions of toxic air contaminants, and would not have the potential to cumulatively exceed SCAQMD risk thresholds. Given the temporary nature and low toxic air contaminant emission level for the proposed Project's and cumulative projects, the proposed Project would have a less-than-significant cumulative health risk (Class III).

- **The Project would not conform to Federal General Conformity Rules (Impact AQ-6).** This impact is strictly applicable to single project evaluation. Therefore, cumulative impacts do not apply (No Impact).
- **The Project would create objectionable odors (Impact AQ-7).** Construction equipment and operations, such as asphalt paving, may create temporary and mildly objectionable odors. Such odors would not significantly affect a substantial number of people. To have the potential to combine with odors from the Project, odor-generating activities from other current and proposed Projects would have to occur concurrently, occur in very close proximity with the odor-generating activities of the Project, and result in a cumulatively worse odor condition. Given the temporary nature and relative mildness of the Project's construction odors, odor impacts related to the proposed Project would be adverse but not cumulatively significant (Class III).
- **The Project would not conform to Angeles National Forest air quality strategies (Impact AQ-8).** This impact is strictly applicable to single project evaluation. Therefore, cumulative impacts do not apply (No Impact).
- **The Project would not conform with applicable Air Quality Management Plans (Impact AQ-9).** This impact is strictly applicable to single project evaluation. Therefore, cumulative impacts do not apply (No Impact).
- **Emissions would contribute to climate change (Impact AQ-10).** This impact is already evaluated in a globally cumulative context. Therefore, cumulative impacts do not apply (No Impact).

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

There are no additional feasible mitigation measures that could be imposed on the proposed Project to further reduce its contribution to cumulative air quality effects. All feasible construction emission mitigation measures have been recommended to mitigate Impacts AQ-1 and AQ-3.

3.3.7 Alternative 3: West Lancaster Alternative

3.3.7.1 Direct and Indirect Effects Analysis

Alternative 3 is described in detail in Section 2.3. This alternative remains within the same local air district jurisdictions, air basins, and SCAQMD SRAs; and so does not change the affected regional environment from that of the proposed Project, as described in Section 3.3.2.

This alternative's construction methods do not change from those described for Alternative 2 (SCE's Proposed Project). The proposed route for this alternative does not change from that of Alternative 2 within the KCAPCD or SCAQMD jurisdictions; therefore, the construction emissions for this alternative are only presented numerically, in Appendix C, for the AVAQMD jurisdiction within the MDAB.

This alternative would cause construction activities similar to those of the proposed Project, except it would:

- Decrease the number of new towers by one and increase the overall line length by 0.4 mile for Segment 4.

The maximum daily construction emissions for this very minor route change are identical to that assumed for the proposed Project. Annual emissions are identical to that estimated for the proposed Project for every year other than 2010. Appendix C provides the emission assumptions and detailed emission calculations for this alternative and shows a comparison with the annual emissions estimated for the proposed Project.

Regional Emission Thresholds (Criterion AIR1)

Construction emissions associated with Alternative 3 would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-1) in the same way as Alternative 2, with the exception of a very minor Project route adjustment in the AVAQMD jurisdiction that does not change the construction methods or the construction schedule overlap. Therefore, the AVAQMD, and other jurisdiction, maximum daily emissions are identical to those of Alternative 2 (see Table 3.3-18). Accordingly, this alternative has significant and unavoidable (Class I) regional air quality impacts for SCAQMD and AVAQMD. The recommended mitigation measures for Impact AQ-1 are identical to those recommended for Alternative 2~~.~~ (See Section 3.3.6.1) ~~to~~that provide maximum feasible mitigation for this Class I impact.

Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-2). This alternative would have identical direct and indirect operating emissions as Alternative 2. Therefore, like Alternative 2, due to the Project's indirect emission reductions this alternative's operating emissions would provide a beneficial regional operating emissions impact (Class IV).

SCAQMD Localized Significance Thresholds (Criterion AIR2)

Construction of Alternative 3 would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-3). Alternative 3 is a minor route adjustment in a sparsely populated area. It will move the route slightly farther from two existing residences than the Alternative 2 route. However, it will not change the route or impacts in the SCAQMD jurisdiction, so the localized emissions presented in Table 3.3-20 are still valid for this alternative. The mitigation measures recommended for Impact AQ-1 mitigate construction emissions to the maximum feasible extent, so no additional mitigation is recommended for this impact. Therefore, this alternative, like Alternative 2, will have significant and unavoidable (Class I) temporary air quality impacts to sensitive receptors in SCAQMD jurisdiction.

Operation of Alternative 3 would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-4). This alternative would have identical direct and indirect operating emissions as Alternative 2. Therefore, like Alternative 2, this alternative's operating emissions would have a less-than-significant impact (Class III) to local sensitive receptors.

Air Toxic Contaminant Emissions (Criterion AIR3)

Construction or operation of Alternative 3 would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds (Impact AQ-5). Alternative 3 does not impact the Project's construction within SCAQMD jurisdiction, and only marginally impacts construction emissions within AVAQMD jurisdiction. Therefore, like Alternative 2, this alternatives construction and operation emissions would not exceed SCAQMD risk thresholds so the Project would have less-than-significant (Class III) health risk impacts.

Federal General Conformity Rule (Criterion AIR4)

The Project would ~~not~~ conform to Federal General Conformity Rules (Impact AQ-6). Alternative 3 does not change the emissions in the ANF. Therefore, the impacts for this alternative are identical to Alternative 2. ~~and this alternative has identical recommended mitigation of Alternative 2.~~ Like Alternative 2, ~~with incorporation of Mitigation Measure AQ-6,~~ this alternative would conform to the SIP and would have a less-than-significant impact (Class III).

Odors (Criterion AIR5)

The Project would create objectionable odors (Impact AQ-7). Alternative 3 would have identical construction and operation odor potential as Alternative 2. Therefore, like Alternative 2, this alternative would have less-than-significant (Class III) odor impacts.

Angeles National Forest Strategy Conformance (Criterion AIR6)

The Project would not conform to Angeles National Forest air quality strategies (Impact AQ-8). Alternative 3 does not change the construction requirements and methods within the Angeles National Forest from those in Alternative 2. Therefore, like Alternative 2, with the incorporation of the air quality Mitigation Measures AQ-1a through AQ-1j, the air quality strategy would be compliant with ANF air quality strategies and the Project impacts would be less than significant (Class II).

Conformance with Applicable Air Quality Management Plans (Criterion AIR7)

The Project would not conform with applicable Air Quality Management Plans (Impact AQ-9). Alternative 3 has identical impacts, and recommended mitigation measures, as Alternative 2 in respect to conforming to AQMPs. Therefore, like Alternative 2, with incorporation of mitigation measures AQ-1a, AQ-1b, and AQ-1d. This alternative would be consistent with the currently approved Air Quality Management Plans and would have a less-than-significant impact (Class II).

Climate Change Impacts (Criterion AIR8)

Emissions would contribute to climate change (Impact AQ-10). The GHG emissions estimated for construction and operating activities are essentially the same as those for the proposed Project shown in Tables 3.3-22, and 3.3-23, as is the forecast indirect emission decrease. Therefore, this alternative has essentially the identical impacts as the proposed Project and would provide a beneficial GHG emissions impact (Class IV).

3.3.7.2 Cumulative Effects Analysis

Alternative 3 is a minor reroute of Alternative 2 and as such has the same geographic extent, existing cumulative conditions, reasonably foreseeable future projects and changes, and impacts as Alternative 2. Therefore, Alternative 3 would have the same potential cumulative impacts as Alternative 2 (see Section 3.3.6.2).

3.3.8 Alternative 4: Chino Hills Route Alternatives

3.3.8.1 Direct and Indirect Effects Analysis

Alternative 4 is described in detail in Section 2.4. This set of five~~our~~ route alternatives remains within the same local air district jurisdictions and air basins as Alternative 2. However, these transmission route alternatives cover one more SCAQMD SRA (16 – North Orange County) than Alternative 2.

This alternative's construction methods do not change from those described for Alternative 2. The proposed route for this alternative does not change from that of the proposed Project within the KCAPCD or AVAQMD jurisdictions; therefore, the construction emissions for this alternative are only presented numerically, in Appendix C, for the SCAQMD jurisdiction.

This alternative would cause construction activities similar to those of the proposed Project, with the following exceptions~~ it would~~:

For Alternative 4A

- Would require the construction of a new ~~4 to .5~~ 6.2 acre[5] gas-insulated switching station (in SRA 33).
- Would decrease the number of new towers by approximately 54 ~~90 to 92~~ in comparison with Alternative 2.
- Would not require the construction of Segments 8B or 8C from Chino Substation to Mira Loma Substation.
- Would not require wreckout and construction of 66kV lines.
- Would not require upgrades to Mira Loma substation.

For Alternative 4B

Construction activities would be the same as 4A, other than route, and:

- Would require approximately 19 more new towers than 4A and route would be a corresponding amount longer.

For Alternative 4C (original from Draft EIR/EIS)

Construction activities would be the same as 4A, other than route, and:

- Would require approximately 40 more towers than 4A, route would be a corresponding amount longer, and would require the wreckout of approximately 29 existing towers.

For Alternative 4C Modified

Construction activities would be the same as 4A, other than route, and:

- Would require approximately 29 more towers than 4A, route would be a corresponding amount longer, and would require the wreckout of approximately 23 existing towers.
- Would require an unbalanced cut/fill switchyard (700,000 cubic yards cut, 1,000 cubic yard fill) that would increase heavy haul trips.

For Alternative 4D

Construction activities would be the same as 4A, other than route, and:

- Would require approximately 29 ~~to 36~~ more new towers than 4A and route would be a corresponding amount longer.

The maximum daily construction emissions for each route under this alternative are assumed to be identical, with no additional overlapping construction activities, to that assumed for the proposed Project. Annual emissions are identical to that estimated for the proposed Project for every year other than 2010, 2011, and 2012. Appendix C provides the emission assumptions and detailed emission calculations for this alternative and shows a comparison with the annual emissions estimated for the Alternative 2.

Regional Emission Thresholds (Criterion AIR1)

Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-1). Alternative 4 is the same as Alternative 2, with the exception of a Project route adjustment in the SCAQMD jurisdiction that does not change the construction methods or the maximum construction schedule overlap. Therefore, the SCAQMD, and other jurisdiction, maximum daily emissions are identical to those of Alternative 2 (see Table 3.3-18). Accordingly, this alternative has significant and unavoidable (Class I) regional air quality impacts for SCAQMD and AVAQMD. The

[5] SCE provided updated switchyard design information for Alternative 4C and 4C Modified that increased the size of the switchyard to 6.2 acres. For air quality emission calculation purposes it is assumed that the switchyard is 6.2 acres for all Alternative 4 options.

recommended mitigation measures are identical to those recommended for Alternative 2, with the exception of additional mitigation measures for the Alternative 4C Modified and switchyard construction. ~~See Section 3.3.6.1 to provide maximum feasible mitigation for this Class I impact.~~ Two additional mitigation measures are added to mitigate the Alternative 4C Modified switchyard construction waste soil hauling emissions to reduce the construction emissions to the maximum feasible degree. However, after mitigation the regional construction emission impacts are still significant and unavoidable (Class I).

Additional Mitigation Measures for Impact AQ-1 (Alternative 4C Modified Only)

AQ-1k Waste Soil Trip Distance Minimization. The haul trip distances for the switchyard construction waste soil shall be minimized to the extent feasible by working with other agencies to identify the closest locations for reuse (sand and gravel plants) or disposal of the waste soil.

AQ-1l Waste Soil Truck Capacity. Double trailer trucks with a minimum total effective capacity of 20 cubic yards will be used to haul the switchyard construction waste soil.

Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-2). Alternative 4 would have nearly identical direct and identical indirect operating emissions as Alternative 2. There would be some minor additional inspection and maintenance activities associated with the new switchyard, but these emissions would ~~not be anywhere near~~ be well below the SCAQMD regional significance criteria. Therefore, like Alternative 2, due to the Project's indirect emission reductions this alternative's operating emissions would provide a beneficial regional operating emissions impact (Class IV).

SCAQMD Localized Significance Thresholds (Criterion AIR2)

Construction of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-3). Alternative 4 is a route adjustment in a sparsely populated area. It will also eliminate construction in more populated areas from the Chino Substation to the Mira Loma substation. Therefore, in comparison with Alternative 2, this alternative would have a lower potential for adverse impacts to sensitive receptors. However, overall it will not change the level of localized impact in the SCAQMD jurisdiction, so the localized emissions presented in Table 3.3-20, with the removal of the Mira Loma substation row, are still valid for this alternative.

The new switchyard construction, for Alternative 4B and 4D only, adds another potential location for localized impacts. Alternative 4A, ~~and~~ 4C, and 4C Modified also have a new switchyard, but for those alternatives the switchyard would be more than a mile and more than 700 meters, respectively from the nearest residential or other sensitive receptor. The switchyard for Alternative 4B and 4D is approximately 400 meters from the nearest residential receptor. For this location that is located in SRA 33 the NOx, PM10 and PM2.5 LST significance thresholds for 400 meters from a 5 acre site, assuming linear interpolation between the 200 and 500 meter values shown in Table 3.3-15, would be 680, 261, and 128 pounds per day respectively. The Switchyard construction daily emissions will be nowhere near those values so no additional significant impacts will result from Alternative 4.

The mitigation measures recommended for Impact AQ-1 mitigate construction emissions to the maximum feasible extent, so no additional mitigation is recommended for this impact. Therefore, this alternative, like Alternative 2, will have significant and unavoidable (Class I) temporary air quality impacts to sensitive receptors in SCAQMD jurisdiction.

Operation of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-4). Alternative 4 would have nearly identical direct and identical indirect operating emissions as

Alternative 2. There would be some minor additional inspection and maintenance activities associated with the new switchyard, but these emissions would not be anywhere near the SCAQMD localized significance criteria that would apply to this remote switchyard. Therefore, like Alternative 2, this alternative's operating emissions would have a less-than-significant impact (Class III) to local sensitive receptors.

Air Toxic Contaminant Emissions (Criterion AIR3)

Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds (Impact AQ-5). Alternative 4 does not, with the exception of the construction and operation of the new switchyard, impact the Project's construction methods or direct operating emissions within SCAQMD jurisdiction, and does not impact emissions in the AVAQMD or KCAPCD jurisdiction. Additionally, the Project's construction occurs over a very limited period that would further reduce the long term chronic exposures (carcinogenic and non-carcinogenic exposures) to DPM and other air toxic contaminants. Therefore, like Alternative 2, the risk from Project construction at any given receptor area would be well below the SCAQMD significance thresholds so the Project would have less-than-significant (Class III) health risk impacts.

Federal General Conformity Rule (Criterion AIR4)

The Project would ~~not~~ conform to Federal General Conformity Rules (Impact AQ-6). Alternative 4 does not change the emissions in the ANF. Therefore, the impacts for this alternative are identical to Alternative 2. ~~and this alternative has identical recommended mitigation of Alternative 2.~~ Like Alternative 2~~, with incorporation of Mitigation Measure AQ-6,~~ this alternative would conform to the SIP and would have a less-than-significant impact (Class III).

Odors (Criterion AIR5)

The Project would create objectionable odors (Impact AQ-7). Alternative 4 would have essentially identical construction and operation odor potential as Alternative 2. Therefore, like Alternative 2, this alternative would have less-than-significant (Class III) odor impacts.

Angeles National Forest Strategy Conformance (Criterion AIR6)

The Project would not conform to Angeles National Forest air quality strategies (Impact AQ-8). Alternative 4 does not change the construction requirements and methods within the Angeles National Forest from those in Alternative 2. Therefore, like Alternative 2, with the incorporation of the air quality Mitigation Measures AQ-1a through AQ-1j, the air quality strategy would be compliant with ANF air quality strategies and the Project impacts would be less than significant (Class II).

Conformance with Applicable Air Quality Management Plans (Criterion AIR7)

The Project would not conform with applicable Air Quality Management Plans (Impact AQ-9). Alternative 4 has identical impacts, and recommended mitigation measures, as Alternative 2 in respect to conforming to AQMPs. Therefore, like Alternative 2, with incorporation of mitigation measures AQ-1a, AQ-1b, and AQ-1d, this alternative would be consistent with the currently approved Air Quality Management Plans and would have a less-than-significant impact (Class II).

Climate Change Impacts (Criterion AIR8)

Emissions would contribute to climate change (Impact AQ-10). The GHG emissions estimated for construction and operating activities, while slightly different than that shown for Alternative 2 (Tables 3.3-22, and 3.3-23), would due to the very large indirect emissions reduction have the same overall significant Project GHG emission reduction. Therefore, this alternative has essentially the identical impacts as the proposed Project and would provide a beneficial GHG emissions impact (Class IV).

3.3.8.2 Cumulative Effects Analysis

Alternative 4 is a reroute of Alternative 2 in Segment 8, and as such has the same general geographic extent, existing cumulative conditions, reasonably foreseeable future projects and changes, and impacts as Alternative 2. Specifically, the new route would not have as many cumulative projects within one mile as the original route for Segment 8, and as such would have a lower potential for cumulative impacts along Segment 8. However, Alternative 4 would have the same cumulative impact levels as Alternative 2 (see Section 3.3.6.2).

3.3.9 Alternative 5: Partial Underground Alternative

3.3.9.1 Direct and Indirect Effects Analysis

Alternative 5 is described in detail in Section 2.5. This alternative only covers a 3.5 mile portion of the Segment 8 route within SRA 33. However, this alternative introduces completely different construction methods and would be in construction from 2009 through 2013. The proposed route for this alternative does not change from that of the proposed Project within the KCAPCD or AVAQMD jurisdictions; therefore, the construction emissions for this alternative are only presented numerically for the SCAQMD jurisdiction.

This alternative would cause construction activities similar to those of the proposed Project, except it would:

- Require the construction of 3.5 miles of undergrounded lines (in SRA 33).
- Decrease the number of new towers by 15 in comparison with Alternative 2.

The maximum daily construction emissions and annual emissions for this alternative are different from Alternative 2 in the SCAQMD jurisdiction. Appendix C provides the emission assumptions and detailed emission calculations for this alternative and shows a comparison with the annual emissions estimated for the Alternative 2.

Regional Emission Thresholds (Criterion AIR1)

Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-1). Alternative 5 is the same as Alternative 2 for the AVAQMD and KCAPCD jurisdictions. However, the worst case daily emissions for SCAQMD would increase due to the additional construction activities required for this alternative, but would not cause any additional emission exceedances, just increase the existing emission exceedances. Overall, this alternative would disproportionally increase criteria pollutant emissions in comparison with Alternative 2 (see Appendix C).

Implementation of recommended Mitigation Measures AQ-1a through AQ-1j, as previously recommended for Alternative 2, and two additional mitigation measures added to mitigate the waste soil hauling

emissions would reduce the construction emissions to the maximum feasible degree. However, after mitigation the regional construction emission impacts are still significant and unavoidable (Class I)

Additional Mitigation Measures for Impact AQ-1

AQ-1m~~k~~ Tunnel Waste Trip Distance Minimization. The haul trip distances for the waste soil and rock from tunneling shall be minimized to the extent feasible by working with other agencies to identify the closest locations for reuse (sand and gravel plants) or disposal of the tunneling soil and rock wastes.

AQ-1n~~l~~ Tunnel Waste Truck Capacity. Double trailer trucks with a minimum total effective capacity of 20 cubic yards will be used to haul the tunneling waste soil and rock.

Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-2). Alternative 5 would have increased operating emissions in comparison with Alternative 2, due to the increased inspection and maintenance requirements for the underground line. However, this increase, which is assumed to be limited to occasional small truck trips, is not considered to be higher on a daily basis that the operating emissions already calculated for the proposed ~~p~~Project. Therefore, like Alternative 2, due to the Project's indirect emission reductions this alternative's operating emissions would provide a beneficial regional operating emissions impact (Class IV).

SCAQMD Localized Significance Thresholds (Criterion AIR2)

Construction of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-3). Alternative 5 covers an area that includes significant residential development. The location of the construction equipment will, by necessity, have to be very close to homes. Table 3.3-24 presents the comparison of worst-case daily onsite construction emissions, showing only the tunneling off-road equipment emissions, for the underground line and the SRA 33 LST for a one-acre construction site with receptors located 25 meters from the site. Appendix C provides the assumptions for the worst-case construction activity for localized impact assessment for this alternative.

Table 3.3-24. Alternative 5 Localized Impact Emissions Comparison – Additional Construction

	NOx	PM10	PM2.5
Undergrounding construction (1-acre)	494	20	18
Localized Significance Threshold (25 meters)	118	5	4
Exceeds (YES/NO)	YES	YES	YES

The mitigation measures recommended for Impact AQ-1 mitigate construction emissions to the maximum feasible extent, so no additional mitigation is recommended for this impact. This alternative creates a new significant localized NOx impact that does not occur for the proposed ~~p~~Project and creates higher magnitude PM10 and PM2.5 significant impacts. Therefore, this alternative, like Alternative 2, will have significant and unavoidable (Class I) temporary air quality impacts to sensitive receptors in SCAQMD jurisdiction.

Operation of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-4). Alternative 5 would have additional inspection and maintenance activities associated with the underground section; however, those emissions would be limited to smaller vehicles going to the from the underground access locations and would not result in a considerable amount of emissions in any one location and these inspection and maintenance emissions would not be anywhere near the SCAQMD localized significance criteria. Therefore, like Alternative 2, this alternative's operating emissions would have a less-than-significant impact (Class III) to local sensitive receptors.

Air Toxic Contaminant Emissions (Criterion AIR3)

Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds (Impact AQ-5). Alternative 5 does not, with the exception of the construction and operation of the underground section, impact the Project's construction methods or direct operating emissions within SCAQMD jurisdiction, and does not impact emissions in the AVAQMD or KCAPCD jurisdiction. Additionally, the Project's construction occurs over a limited period, no more than 5 years that would further reduce the long term chronic exposures (carcinogenic and non-carcinogenic exposures) to DPM and other air toxic contaminants. Therefore, like Alternative 2, the risk from Project construction at any given receptor area is expected to be below the SCAQMD significance thresholds so the Project would have less-than-significant (Class III) health risk impacts.

Federal General Conformity Rule (Criterion AIR4)

The Project would ~~not~~ conform to Federal General Conformity Rules (Impact AQ-6). Alternative 5 does not change the emissions in the ANF. Therefore, the impacts for this alternative are identical to Alternative 2~~ and this alternative has identical recommended mitigation of Alternative 2~~. Like Alternative 2~~, with incorporation of Mitigation Measure AQ-6,~~ this alternative would conform to the SIP and would have a less-than-significant impact (Class III).

Odors (Criterion AIR5)

The Project would create objectionable odors (Impact AQ-7). Alternative 5 would have essentially identical construction and operation odor potential as Alternative 2. Therefore, like Alternative 2, this alternative would have less-than-significant (Class III) odor impacts.

Angeles National Forest Strategy Conformance (Criterion AIR6)

The Project would not conform to Angeles National Forest air quality strategies (Impact AQ-8). Alternative 5 does not change the construction requirements and methods within the Angeles National Forest from those in Alternative 2. Therefore, like Alternative 2, with the incorporation of the air quality Mitigation Measures AQ-1a through AQ-1j, the air quality strategy would be compliant with ANF air quality strategies and the Project impacts would be less than significant (Class II).

Conformance with Applicable Air Quality Management Plans (Criterion AIR7)

The Project would not conform with applicable Air Quality Management Plans (Impact AQ-9). Alternative 5 has identical impacts, and recommended mitigation measures, as Alternative 2 in respect to conforming to AQMPs. Therefore, like Alternative 2, with incorporation of mitigation measures AQ-1a, AQ-1b, and AQ-1d. This alternative would be consistent with the currently approved Air Quality Management Plans and would have a less-than-significant impact (Class II).

Climate Change Impacts (Criterion AIR8)

Emissions would contribute to climate change (Impact AQ-10). The GHG emissions estimated for construction are higher for this alternative than for Alternative 2 (Tables 3.3-22, and 3.3-23); however, due to the very large indirect emissions reductions would have the same overall significant Project GHG emission reduction. Therefore, this alternative has essentially the identical impacts as the proposed Project and would provide a beneficial GHG emissions impact (Class IV).

3.3.9.2 Cumulative Effects Analysis

Alternative 5 revises a small portion of the Segment 8 route from being overhead lines to being underground lines, and as such has the same general geographic extent, existing cumulative conditions, reasonably foreseeable future projects and changes, and impacts as Alternative 2. Therefore, Alternative 5 would have the same cumulative impact levels as Alternative 2 (see Section 3.3.6.2).

3.3.10 Alternative 6: Maximum Helicopter Construction in the ANF Alternative

3.3.10.1 Direct and Indirect Effects Analysis

The alternatives are described in detail in Section 2. This alternative changes the construction method in the more remote areas of Segments 6 and 11, by increasing the number of towers that are constructed by helicopter construction. This will impact emissions within the SoCAB and AVAQMD portion of the MDAB from 2010 through 2013. This alternative would cause construction activities similar to those of the proposed Project, except it would:

- Require the helicopter construction of an additional 115~~0~~ towers in comparison to Alternative 2.
- Require the helicopter wreckout of an additional 114~~07~~ towers in comparison with Alternative 2.
- Require the construction of additional helicopter staging areas in comparison with Alternative 2.
- Require less road construction and road rehabilitation work in comparison with Alternative 2.

The maximum daily construction emissions for this alternative are the same as Alternative 2, while the annual emissions for this alternative are different from Alternative 2 in the SCAQMD and AVAQMD jurisdictions. Appendix C provides the emission assumptions and detailed emission calculations for this alternative and shows a comparison with the annual emissions estimated for Alternative 2.

Regional Emission Thresholds (Criterion AIR1)

Construction emissions associated with Alternative 6 would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-1) in the same way as Alternative 2, with the exception that there would be more maximum emission days due to the increased duration~~length~~ of the helicopter construction. Therefore, the maximum daily emissions are identical to those of Alternative 2 (see Table 3.3-18) and the maximum annual emissions from KCAPCD are not impacted by this alternative. Accordingly, this alternative has significant and unavoidable (Class I) regional air quality impacts for SCAQMD and AVAQMD. The recommended mitigation measures for Impact AQ-1 are identical to those recommended for Alternative 2~~.~~ (See Section 3.3.6.1) ~~to~~ that provide maximum feasible mitigation for this Class I impact.

Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-2). Alternative 6 would have identical direct and indirect operating emissions as Alternative 2. Therefore, like Alternative 2, due to the project's indirect emission reductions this alternative's operating emissions would provide a beneficial regional operating emissions impact (Class IV).

SCAQMD Localized Significance Thresholds (Criterion AIR2)

Construction of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-3). Alternative 6 covers an area that is generally remote, as would be expected for tower sites

constructed by helicopter construction methods. The helicopter staging areas and the new towers constructed by helicopter are all more than 500 meters away from any sensitive receptor locations. Additionally, the majority of the helicopter emissions occur above ground level and are also well dispersed through the action of the rotors. Therefore, while the helicopters have relatively high emissions of certain pollutants (NOx in particular) the increase in helicopter construction from this alternative will not change the impacts to sensitive receptors. Therefore, this alternative, like Alternative 2, will have significant and unavoidable (Class I) temporary air quality impacts to sensitive receptors in SCAQMD jurisdiction.

Operation of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-4). Alternative 6 would have identical direct and indirect operating emissions as Alternative 2. Therefore, like Alternative 2, this alternative's operating emissions would have a less than significant impact (Class III) to local sensitive receptors.

Air Toxic Contaminant Emissions (Criterion AIR3)

Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds (Impact AQ-5). Alternative 6 does not, with the exception of the additional helicopter construction activities, impact the project's construction methods or direct operating emissions within SCAQMD and AVAQMD jurisdictions, and does not impact emissions in the KCAPCD jurisdiction. Additionally, the differences in the project's construction for this alternative occurs in remote areas with no nearby sensitive receptors and over a limited period of time, no more than 4 years, that would further reduce the long term chronic exposures (carcinogenic and non-carcinogenic exposures) to DPM and other air toxic contaminants. Therefore, like Alternative 2, the risk from project construction at any given receptor area is expected to be below the SCAQMD significance thresholds so the project would have less than significant (Class III) health risk impacts.

Federal General Conformity Rule (Criterion AIR4)

The Project would ~~not~~ conform to Federal General Conformity Rules (Impact AQ-6). Alternative 6 results in changes to the annual construction emissions in the ANF portions of the SoCAB and the AVAQMD portion of the MDAB from 2010 through 2012. The revised annual emissions in the SoCAB and AVAQMD portion of the MDAB are provided below in Table 3.3-25. As shown for Alternative 2 in Table 3.3-21, the Project's CO, PM10, PM2.5, and SO_2 construction emissions are well below levels needed to exceed the general conformity applicability trigger levels, and the extra helicopter construction activities will not impact these pollutants to nearly the extent to reach anywhere near their trigger levels, so the emissions of these pollutants are not shown in Table 3.3-25.

~~A comparison of Table 3.3-21 and Table 3.3-25 shows that Alternative 6 has higher construction NOx emissions for project construction during 2010 through 2012, and has the same overall findings with respect to exceeding General Conformity applicability triggers in the SoCAB but creates a new exceedance of the AVAQMD/MDAB applicability trigger for NOx. However, the NOx emission estimate does not include the NOx reduction from the recommended off-road equipment mitigation measures, which would reduce the annual NOx emissions in the AVAQMD portion of the MDAB to less than 25 tons per year in 2012. Therefore, while the magnitude of the SoCAB emissions are higher than for Alternative 2, the impact level for this alternative is identical to Alternative 2 and this alternative has identical recommended mitigation of Alternative 2. Like Alternative 2, with incorporation of Mitigation~~

~~Measure AQ-6, this alternative would conform to the SIP and would have a less than significant impact (Class II).~~

Table 3.3-25. Alternative 6 Emissions/General Conformity Emissions Threshold Comparison

		Emissions (Tons/year)	
Air Basin		NOx	VOC
SoCAB	2010 Emissions	35.62~~.8~~	8.7~~0~~
	2011 Emissions	38.15~~.5~~	6.4~~0~~
	2012 Emissions	28.6~~0~~	6.1~~0~~
	Applicability Trigger	25~~10~~	25~~10~~
	Exceeds (YES/NO)	YES	NO
MDAB AVAQMD	2010 Emissions	12.6~~1.6~~	3.0~~2.7~~
	2011 Emissions	5.7~~3~~	0.9~~8~~
	2012 Emissions	26.4~~5.4~~	5.5~~4~~
	Applicability Trigger [a]	100~~25~~	100~~25~~
	Exceeds (YES/NO)	NO~~YES~~	NO

Table Note:
a- Antelope Valley portion of the MDAB.

A comparison of Table 3.3-21 and Table 3.3-25 shows that Alternative 6 has considerably higher construction NOx emissions for project construction on federal lands during 2010 through 2012 and that for this Project alternative the annual NOx emissions during the years affected (2010 to 2012) exceed the general conformity de minimus level within the SoCAB. The annual emissions calculations and assumptions are provided in Appendix C. The proposed Project's emission estimates consider the implementation of Mitigation Measures AQ-1a, but are conservative as they do not fully consider implementation of Mitigation Measures AQ-1b through AQ-1j. If the estimated emissions of the recommended Project Alternative are determined to be above the General Conformity applicability thresholds, a complete conformity analysis on the selected Project alternative will be performed as required by statute and approved before the Record of Decision (ROD) is approved for this Project.

The following mitigation measure is recommended for this project alternative, or the agency-recommended preferred alternative if it also exceeds the General Conformity NOx or VOC emission de minimus levels, to ensure this impact to be less than significant (Class II) and provide assurance that the Project will comply with the General Conformity Rule and be shown to conform to the SIP.

Mitigation Measure for Impact AQ-6

AQ-6 **General Conformity Emission Offset Mitigation.** In the event that the final emission estimate for the selected Project alternative as provided in the Project's Conformity Analysis exceeds the NOx and/or VOC emission applicability thresholds, and assuming the SCAQMD does not provide confirmation that the Project's emissions are accounted for in the State Implementation Plan (SIP) emission estimates per 40 CFR §93.158(a)(1), then the Project will obtain emission reduction credits to fully offset the NOx and/or VOC emissions per 40 CFR §93.158(a)(2) for the years that the Project has been estimated to exceed the NOx and/or VOC emission applicability thresholds. Credits shall be submitted to the CPUC and FS for review and approval.

SCE will have several options for obtaining emission offset mitigation, including:

- Traditional NOx emission reduction credits (ERCs) that are in units of lbs/day, where 1 lb/day equals 365 lbs/year. These credits can now be subdivided into short-term yearly credits for purchase. These credits are available at market based prices that can be very expensive.
- Reclaim Trading Credits (RTCs) that are in units of lbs and are year specific. These credits have historically been much less expensive than traditional ERCs.
- Creation of new emission reduction credits, such as mobile source emission reduction credits (MSERCs), where considered enforceable by USEPA for purposes of General Conformity offsets, through methods such as the SCAQMD Regulation XVI Mobile Source Offset Programs or other methods similar to existing stationary source control programs such as the Carl Moyer Program.

While there are many options to obtain the necessary offset credits to comply with Mitigation Measure AQ-6, it is likely that RTCs will make up the bulk of the credits that SCE obtains, which should reduce the cost impact of this mitigation measure.

Odors (Criterion AIR5)

Project would create objectionable odors (Impact AQ-7). Alternative 6 would have essentially identical construction and operation odor potential as Alternative 2. Therefore, like Alternative 2, this alternative would have less than significant (Class III) odor impacts.

Angeles National Forest Strategy Conformance (Criterion AIR6)

The Project would not conform to Angeles National Forest air quality strategies (Impact AQ-8). Alternative 6 increases the amount of helicopter construction within the Angeles National Forest from that required by Alternative 2. This change will increase certain emissions (NOx and SOx) and decrease others (PM10) during the periods when helicopter construction occurs. However, with the incorporation of the air quality Mitigation Measures AQ-1a through AQ-1j, this alternative would continue to have the same impact finding as Alternative 2. Therefore, the air quality strategy would be compliant with ANF air quality strategies and the project impacts would be less than significant after mitigation (Class II).

Conformance with Applicable Air Quality Management Plans (Criterion AIR7)

The Project would not conform with applicable Air Quality Management Plans (Impact AQ-9). Alternative 6 has identical impacts, and recommended mitigation measures, as Alternative 2 in respect to conforming to AQMPs. Therefore, like Alternative 2, with incorporation of mitigation measures AQ-1a, AQ-1b, and AQ-1d, this alternative would be consistent with the currently approved Air Quality Management Plans and would have a less than significant impact (Class II).

Climate Change Impacts (Criterion AIR8)

Emissions would contribute to climate change (Impact AQ-10). The GHG emissions estimated for construction are higher for this alternative than for Alternative 2 (Tables 3.3-22, and 3.3-23); however, due to the very large indirect emissions reductions would have the same overall significant project GHG emission reduction. Therefore, this alternative has essentially the identical impacts as the proposed Project and would provide a beneficial GHG emissions impact (Class IV).

3.3.10.2 Cumulative Effects Analysis

Alternative 6 changes the construction methods but does not change the construction route; therefore, it has the same general geographic extent, existing cumulative conditions, reasonably foreseeable future projects and changes, impacts as Alternative 2. Therefore, Alternative 6 would have the same cumulative impact levels as Alternative 2 (see Section 3.3.6.2).

3.3.11 Alternative 7: 66-kV Subtransmission Alternative

3.3.11.1 Direct and Indirect Effects Analysis

The alternatives are described in detail in Section 2. This alternative changes the amount of construction method and the routing in Segments 7 and 8, by addition 66-kV construction and wreck out requirements. This will impact emissions within the SoCAB from 2009 through 2013. This alternative would cause construction activities similar to those of the proposed Project, except it would:

For Option 1

- Would require the underground construction of approximately 3,300 feet and another 6,000 feet of 66-kV line in Segment 7.
- Would require the construction of approximately 1.19~~63~~ miles of new overhead 66-kV poles/line.
- Would utilize the existing infrastructure of approximately 0.43 miles between the San Gabriel Junction and Lincoln Avenue
- Would require the demolition of the existing 66-kV poles/lines being replaced in Segment 7 and 8.

For Option 2

- Would require the underground construction of approximately 3,300 feet and another 6,000 feet of 66-kV line in Segment 7.
- Would require the construction of approximately 1.32 miles of new overhead 66-kV poles/line.
- Would utilize the existing infrastructure of approximately 0.43 miles between the San Gabriel Junction and Lincoln Avenue
- Would require the demolition of the existing 66-kV poles/lines being replaced in Segment 7 and 8.

Since the lengths of 66-kV line for the two options are only different by 0.13 miles, the infrastructure required for Option 1 and Option 2 would basically be the same. The maximum daily construction emissions and annual emissions for this alternative are different from Alternative 2 in the SCAQMD jurisdictions. Appendix C provides the emission assumptions and detailed emission calculations for this alternative and shows a comparison with the annual emissions estimated for Alternative 2.

Regional Emission Thresholds (Criterion AIR1)

Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-1). Alternative 7 is the same as Alternative 2 for the KCAPCD and AVAQMD jurisdictions. While there are incremental emission increases for Alternative 7, they are not forecast to occur at the same time as the previously determine Alternative 2 worst-case day or create a new worst day.

Therefore, the SCAQMD, and other jurisdiction, maximum daily emissions are identical to those of Alternative 2 (see Table 3.3-18). Accordingly, this alternative has significant and unavoidable (Class I)

regional air quality impacts for SCAQMD and AVAQMD. The recommended mitigation measures for Impact AQ-1 are identical to those recommended for Alternative 2~~.~~ (See Section 3.3.6.1) ~~to~~ that provide maximum feasible mitigation for this Class I impact.

Operating emissions would not exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds (Impact AQ-2). Alternative 7 would have essentially identical direct and identical indirect operating emissions as Alternative 2. Therefore, like Alternative 2, due to the Project's indirect emission reductions this alternative's operating emissions would provide a beneficial regional operating emissions impact (Class IV).

SCAQMD Localized Significance Thresholds (Criterion AIR2)

Construction of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-3). The 66-kV construction proposed under Alternative 7 does not have higher localized emission potentials from that already evaluated under Alternative 2. Therefore, this alternative, like Alternative 2, will have significant and unavoidable (Class I) temporary air quality impacts to sensitive receptors in SCAQMD jurisdiction.

Operation of the Project would expose sensitive receptors to substantial pollutant concentrations (Impact AQ-4). Alternative 7 would have essentially identical direct and identical indirect operating emissions as Alternative 2. Therefore, like Alternative 2, this alternative's operating emissions would have a less-than-significant impact (Class III) to local sensitive receptors.

Air Toxic Contaminant Emissions (Criterion AIR3)

Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds (Impact AQ-5). Alternative 7 does not, with the exception of the additional 66-kV construction activities, impact the Project's construction methods or direct operating emissions within SCAQMD jurisdiction, and does not impact emissions in the AVAQMD and KCAPCD jurisdictions. Additionally, the differences in the Project's construction for this alternative are fairly minor and occur over a limited period of time that would further reduce the long term chronic exposures (carcinogenic and non-carcinogenic exposures) to DPM and other air toxic contaminants. Therefore, like Alternative 2, the risk from Project construction at any given receptor area is expected to be below the SCAQMD significance thresholds so the Project would have less-than-significant (Class III) health risk impacts.

Federal General Conformity Rule (Criterion AIR4)

The Project would ~~not~~ conform to Federal General Conformity Rules (Impact AQ-6). Alternative 7~~6~~ does not change the emissions in the ANF. The revisions to the construction requirements within USACE lands due to this alternative are minimal and would not significantly change the overall annual federal lands annual emissions totals. ~~Therefore, the impacts for this alternative are identical to Alternative 2 and this alternative has identical recommended mitigation of Alternative 2. Like Alternative 2, with incorporation of Mitigation Measure AQ-6, this alternative would conform to the SIP and would have a less-than-significant impact (Class II).~~ Therefore, like Alternative 2 this alternative would conform to the SIP and would have a less-than-significant impact (Class III).

Odors (Criterion AIR5)

Project would create objectionable odors (Impact AQ-7). Alternative 7 would have essentially identical construction and operation odor potential as Alternative 2. Therefore, like Alternative 2, this alternative would have less-than-significant (Class III) odor impacts.

Angeles National Forest Strategy Conformance (Criterion AIR6)

The Project would not conform to Angeles National Forest air quality strategies (Impact AQ-8). Alternative 7 does not change the construction requirements and methods within the Angeles National Forest from those in Alternative 2. Therefore, like Alternative 2, with the incorporation of the air quality Mitigation Measures AQ-1a through AQ-1j, the air quality strategy would be compliant with ANF air quality strategies and the Project impacts would be less than significant (Class II).

Conformance with Applicable Air Quality Management Plans (Criterion AIR7)

The Project would not conform with applicable Air Quality Management Plans (Impact AQ-9). Alternative 7 has identical impacts, and recommended mitigation measures, as Alternative 2 in respect to conforming to AQMPs. Therefore, like Alternative 2, with incorporation of mitigation measures AQ-1a, AQ-1b, and AQ-1d, this alternative would be consistent with the currently approved Air Quality Management Plans and would have a less-than-significant impact (Class II).

Climate Change Impacts (Criterion AIR8)

Emissions would contribute to climate change (Impact AQ-10). The GHG emissions estimated for construction are slightly higher for this alternative than for Alternative 2 (Tables 3.3-22, and 3.3-23); however, due to the very large indirect emissions reductions would have the same overall significant Project GHG emission reduction. Therefore, this alternative has essentially the identical impacts as the proposed Project and would provide a beneficial GHG emissions impact (Class IV).

3.3.11.2 Cumulative Effects Analysis

Alternative 7 does not significantly change the construction route; therefore, it has the same general geographic extent, existing cumulative conditions, reasonably foreseeable future projects and changes, and impacts as Alternative 2. Therefore, Alternative 7 would have the same cumulative impact levels as Alternative 2 (see Section 3.3.6.2).

3.3.12 Impact Significance Summary

Table 3.3-26 summarizes the direct and indirect environmental impacts of the proposed Project (Alternative 2) and the other alternatives on air quality. The direct and indirect effects of the proposed Project and alternatives have been fully described in Sections 3.3.6 through 3.3.10 above.

Table 3.3-26. Summary of Impacts and Mitigation Measures – Air Quality

Impact	Impact Significance								Mitigation Measures
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
AQ-1: Construction emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds	Class I	Class I	Class I	Class I	Class I	Class I	Class I	Yes	AQ-1a: Implement Construction Fugitive Dust Control Plan. AQ-1b: Off-road Diesel-fueled Equipment Standards. AQ-1c: Limit Vehicle Traffic and Equipment Use.

Table 3.3-26. Summary of Impacts and Mitigation Measures – Air Quality

Impact	Impact Significance								Mitigation Measures
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
									AQ-1d: Heavy Duty Diesel Haul Vehicle On-road Equipment Standards. AQ-1e: On-road Vehicles Standards. AQ-1f: Properly Maintain Mechanical Equipment. AQ-1g: Restrict Engine Idling to 5 Minutes. AQ-1h: Schedule Deliveries Outside of Peak Traffic Hours. AQ-1i: Off-road Gasoline-fueled Equipment Standards. AQ-1j: Reduction of Helicopter Emissions. AQ-1k: Waste Soil Trip Distance Minimization (Alt 4C Mod only) AQ-1l: Waste Soil Truck Capacity (Alt 4C Mod only) AQ-1m~~k~~: Tunnel Waste Trip Distance Minimization (Alt 5 only) AQ-1n~~l~~: Tunnel Waste Truck Capacity (Alt 5 only)
AQ-2: Operating emissions would exceed the SCAQMD, AVAQMD, and/or KCAPCD regional emission thresholds	Class IV	Class IV	Class IV	Class IV	Class IV	Class IV	Class IV	Yes	None recommended.
AQ-3: Construction of the Project would expose sensitive receptors to substantial pollutant concentrations	Class I	Class I	Class I	Class I	Class I	Class I	Class I	No	AQ-1a to AQ-1j
AQ-4: Operation of the Project would expose sensitive receptors to substantial pollutant concentrations	Class III	Class III	Class III	Class III	Class III	Class III	Class III	No	None recommended.
AQ-5: Construction or operation of the Project would generate toxic air contaminant emissions that would exceed SCAQMD risk thresholds.	Class III	Class III	Class III	Class III	Class III	Class III	Class III	No	None recommended.
AQ-6: The Project would not conform to Federal General Conformity Rules	Class III	Class III	Class III	Class III	Class III	Class II	Class III	Yes	AQ-6: General Conformity Emission Offset Mitigation (Alt 6 only)
AQ-7: The Project would create objectionable odors	Class III	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
AQ-8: The Project would not conform to Angeles National Forest air quality strategies	Class II	Class II	Class II	Class II	Class II	Class II	Class II	Yes	AQ-1a to AQ-1j

Table 3.3-26. Summary of Impacts and Mitigation Measures – Air Quality

Impact	Impact Significance								Mitigation Measures
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
AQ-9: The Project would not conform with applicable Air Quality Management Plans	Class II	Class II	Class II	Class II	Class II	Class II	Class II	Yes	AQ-1a, AQ-1b, and AQ-1d
AQ-10: Emissions would contribute to climate change	Class IV	Class IV	Class IV	Class IV	Class IV	Class IV	Class IV	Yes	None recommended.

* Indicates whether this impact is applicable to the portion of the Project on National Forest System lands.

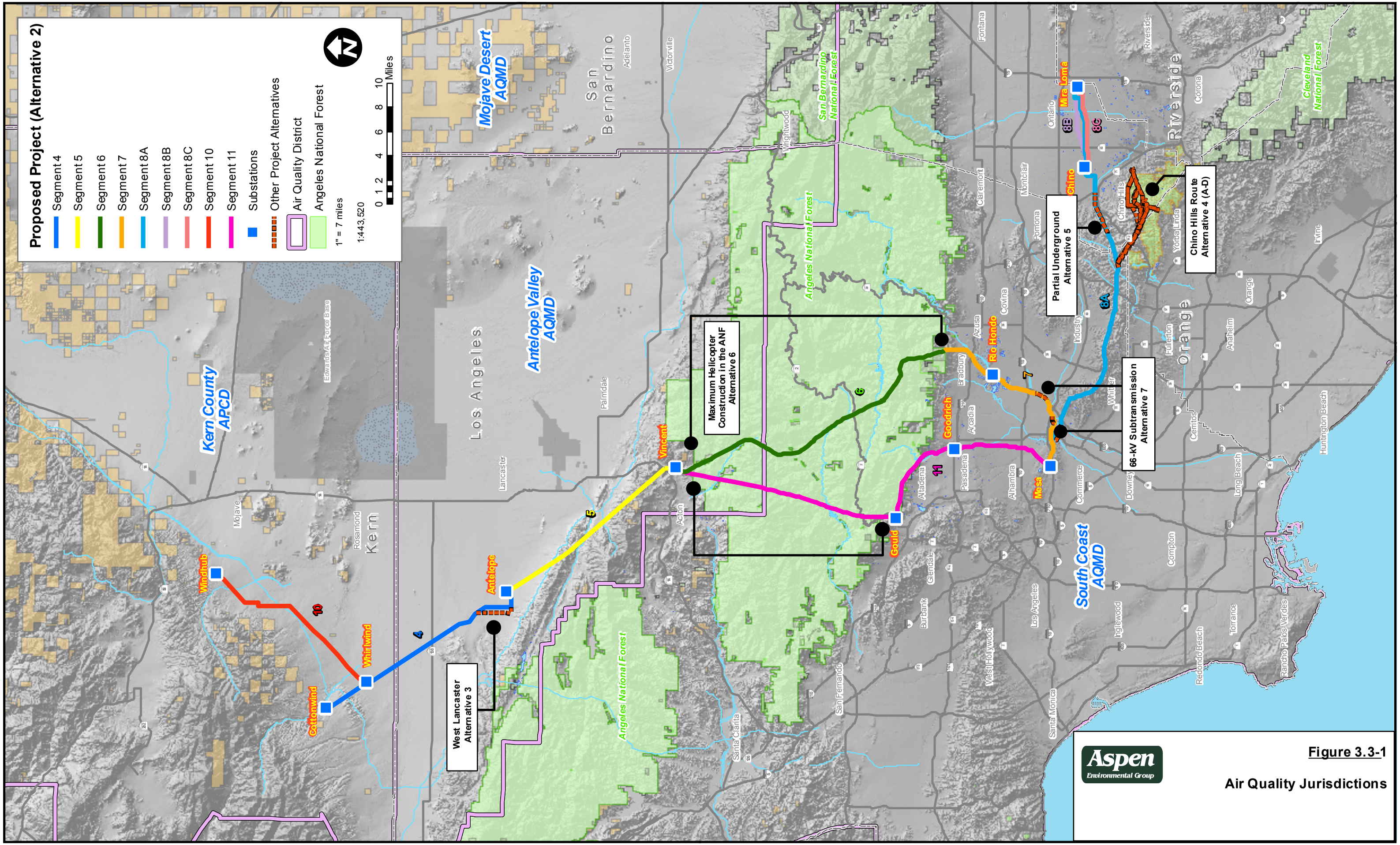


Figure 3.3-1

Air Quality Jurisdictions

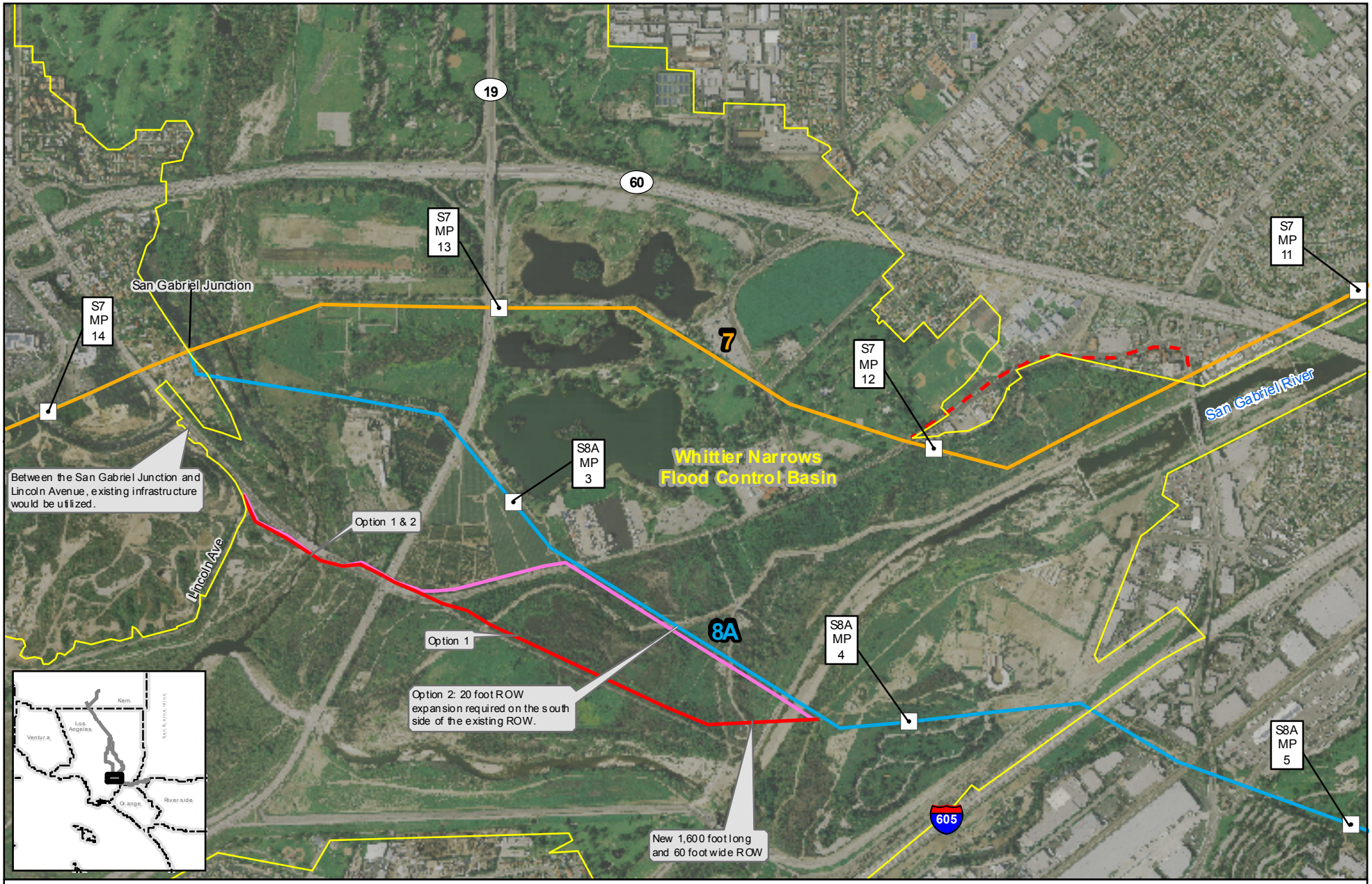


Figure 3.3-2 (New)

Army Corps Land Boundary - Whittier Narrows

3.4 Biological Resources

3.4.1 Introduction

This section describes effects on biological resources that would be caused by implementation of the TRTP. The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts for a range of Project alternatives, and recommends measures to reduce or avoid adverse impacts anticipated from Project construction and operation. In addition, existing laws and regulations relevant to biological resources are described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Project.

The information and analysis that is presented in this section has been derived from the *Tehachapi Renewable Transmission Project Biological Resources Specialist Report*, prepared by Aspen Environmental Group (2008). This report is hereby incorporated by reference in its entirety. While this section presents a summary of the findings of the *Biological Resources Specialist Report*, please refer to that report for more detailed information on Project effects on biological resources.

A Biological Assessment, which evaluated impacts to federally threatened, endangered, proposed, petitioned, and candidate species, is in draft form ~~and will be in Appendix G of the Final EIS/EIR~~. A Biological Evaluation, evaluating impacts to Forest Service (FS) Sensitive species and FS Watch List species, is also in draft form ~~and will be in Appendix H in the Final EIS/EIR~~. A draft Management Indicator Species Report can be found in Appendix F. All three reports are hereby incorporated by reference into this EIS/EIR.

Scoping Issues Addressed

During the scoping period for the EIR/EIS (August-October 2007), a series of scoping meetings were conducted with the public and government agencies, and written comments were received by agencies and the public that identified issues and concerns. The following issues related to biological resources that were raised during scoping are addressed in this section:

- Possible effects of the Project on wildlife movement and special-status plants and animals in the Puente Hills Landfill Native Habitat Preservation Authority (PHLNHPA)
- Effects of the Project on sensitive resources such as Coastal Sage Scrub habitat and the California Gnatcatcher
- The WCA noted the Project has the potential to interfere with wildlife movement in the area of the proposed River Commons Project
- How would noise associated with Project construction and operation affect wildlife in preservation areas?
- Address alternative that avoids impacts to the Habitat Authority Properties and avoids sensitive areas in the Puente Hills, including the No Project/Action Alternative

Summary and Comparison of Alternatives

Table 3.4-1 on the following page presents some key factors related to biological resources for each alternative. These impacts are further described in Sections 3.4.5 through 3.4.11.

Table 3.4-1. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
Loss or degradation of vegetation communities	Potential projects would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and ~~subsequently~~ would introduce similar types of impacts	~~1,538~~1,612 acres of vegetation communities will be degraded, of which ~~277~~ 349 acres will be permanent.	Approx. 1,612~~1,538~~* acres of vegetation communities will be degraded, of which ~~277~~349* acres will be permanent.	Route A: Approx. ~~1,512~~1,651 acres of vegetation communities will be degraded, of which ~~291~~ 366 acres will be permanent. Route B: ~~1,539~~ Approx.~~–~~. 1,678 acres of vegetation communities will be degraded, of which ~~281~~ 356 acres will be permanent. Route C: ~~1,560~~ Approx.~~–~~. 1,729 acres of vegetation communities will be degraded, of which ~~287~~ 365 acres will be permanent. Route C Modified: Approx. 1,708 acres of vegetation communities will be degraded, of which ~~383~~386 acres will be permanent Route D: ~~1,549~~ Approx.~~–~~. 1,688 acres of vegetation communities will be degraded, of which ~~290~~ 365 acres will be permanent.	~~1,563~~ Approx. 1,637 acres of vegetation communities will be degraded, of which ~~280~~ 353 acres will be permanent.	~~1,456~~ Approx. 1,526 acres of vegetation communities will be degraded, of which ~~230~~ 303 acres will be permanent.	~~1,538~~ Approx. 1,612** acres of vegetation communities will be degraded, of which ~~277~~349** acres will be permanent. (Note: Alt. 7 would have additional temporary disturbance associated with underground construction of 66-kV lines in Segment 7, re-routing the 66-kV line around the Whittier Narrows Recreation area in Segments 7 and 8A. New access and spur roads may be required for the new ROW for the San Gabriel River crossing within Segment 8A for Option 1)
Loss or degradation of riparian communities	Same as above.	Approx. ~~13.4~~11.2 acres of riparian communities will be degraded or impacted. In addition, approximately one additional acre of riparian habitat would be impacted by the reconstruction of the crossing of access road 3N27 and Big Tujunga Creek on the ANF.	Unknown acreage of riparian communities will be degraded or impacted as final engineering has not been conducted. Will be similar to Alt. 2.	Unknown acreage of riparian communities will be degraded or impacted as final engineering has not been conducted. Will be greater than Alt. 2.	Same as Alternative 2.	Approx. ~~12.8~~11.1 acres of riparian communities will be degraded or impacted.	Unknown acreage of riparian communities will be degraded or impacted as final engineering has not been conducted. ~~Will be greater~~Potentially less than Alt. 2.

Table 3.4-1. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
Number of Riparian Conservation Areas (RCAs) subject to Project disturbance (NFS lands only)	Same as above.	Vehicle access, road grading, and culvert placement would affect 171 RCAs, of which 95 would be negatively impacted.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Vehicle access, road grading, and culvert placement would affect 86 RCAs, of which 57 would be negatively impacted.	Same as Alternative 2
Potential to spread noxious weeds	Same as above.	Construction would result in potential spread of noxious weeds. ~~225.7~~ Approx. 224.5 miles of access and spur roads would be constructed and improved and approximately ~~1,538~~1,612 acres of ground disturbing activities would result as part of construction.	Same as Alternative 2	Greater land disturbance would occur in open space and riparian habitat, increasing the likelihood for spread of noxious weeds. Route A: ~~231.9~~ Approx. 230.6 miles of constructed and improved roads and ~~1,512~~1,651 acres of ground disturbing activities Route B: ~~228.5~~ Approx. 227.3 miles of constructed and improved roads and ~~1,539~~1,678 acres of ground disturbing activities Route C: ~~231.8~~ Approx. 231.1 miles of constructed and improved roads and ~~1,560~~1,729 acres of ground disturbing activities Route C Modified: 216.7 miles of constructed and improved roads and 1,708 acres of ground disturbing activities Route D: ~~233.2~~ Approx. 232.0 miles of constructed and improved roads and ~~1,549~~1,688 acres of ground disturbing activities	Greater land disturbance would occur in open space, increasing the likelihood for spread of noxious weeds. Approx. 224.5 ~~225.7~~ miles of access and spur roads would be constructed and improved and approximately 1,637~~1,563~~ acres of ground disturbing activities would result as part of construction.	Reduced number of spur roads and potential decrease in road traffic may reduce the likelihood for spread of noxious weeds. Approx. 181.9 ~~183.2~~ miles of access and spur roads would be constructed and improved and approximately 1,526~~1,456~~ acres of ground disturbing activities would result as part of construction.	~~Greater~~ Potentially less land disturbance would occur in open space and riparian habitat, ~~increasing~~ decreasing the likelihood for spread of noxious weeds. Approx. 224.5 ~~225.7~~ miles of access and spur roads would be constructed and improved and approximately 1,612 ~~1,538~~ acres of ground disturbing activities would result as part of construction.

Table 3.4-1. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
Disturbance to common wildlife, nesting birds and raptors	Same as above.	Construction would result in disturbance to wildlife and nesting birds. Noise would occur from approx. ~~For noise,~~ 361,703 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,612 acres of ground disturbing activities would result in habitat disturbance. ~~172.9~~172.5 miles of new transmission line would be added.	Noise would occur from approx. ~~For noise,~~ 361,586 onroad vehicle trips ~~are estimated to occur~~ as part of construction. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,612 acres of ground disturbing activities would result in habitat disturbance. ~~173.3~~172.9 miles of new transmission line would be added.	Greater loss of habitat would increase disturbance to wildlife and nesting birds. Noise would occur from approx. ~~For noise,~~ ~~343,866~~340,332 (Route A), ~~358,186~~348,691 (Route B), ~~374,013~~357,930 (Route C), 400,772 (Route C Mod.), or ~~365,722~~353,091 (Route D) onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Route A: ~~231.9~~230.6 miles of new and upgraded roads and ~~1,512~~1,651 acres of ground disturbing activities. ~~157.2~~156.8 miles of new transmission line would be added Route B: ~~228.5~~227.3 miles of new and upgraded roads and ~~1,539~~1,678 acres of ground disturbing activities. ~~160.8~~160.4 miles of new transmission line would be added Route C: ~~231.8~~231.1 miles of new and upgraded roads and ~~1,560~~1,729 acres of ground disturbing activities. ~~162.8~~159.0 miles of new transmission line would be added Route C Modified: 216.7 miles of new and upgraded	Greater land disturbance would increase disturbance to wildlife and nesting birds. Noise would occur from approx. ~~For noise,~~ 418,912 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,637 acres of ground disturbing activities would result in habitat disturbance. ~~172.9~~172.5 miles of new transmission line would be added.	A reduction in land disturbance would occur; however, helicopter use would increase disturbance to wildlife and nesting birds due to noise, rotor wash, etc. Noise would occur from approx. ~~For noise,~~ 361,697 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately ~~42,014~~43,909 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~183.2~~181.9 miles of new and upgraded road and ~~1,456~~1,526 acres of ground disturbing activities would result in habitat disturbance. ~~172.9~~172.5 miles of new transmission line would be added.	~~Greater~~ Potentially less land disturbance in natural areas would ~~increase~~ decrease disturbance to wildlife and nesting birds. Noise would occur from approx. ~~For noise,~~ 362,861 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,612 acres of ground disturbing activities would result in habitat disturbance. ~~172.9~~172.5 miles of new transmission line would be added.

Table 3.4-1. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
				roads and 1,708 acres of ground disturbing activities. 158.2 miles of new transmission line would be added Route D: ~~233.2~~232.0 miles of new and upgraded roads and ~~1,549~~1,688 acres of ground disturbing activities. ~~160.9~~160.5 miles of new transmission line would be added			
Disturbance to threatened/ endangered and special-status plants	Same as above.	Although not observed, construction may affect listed plant species if present. Potential impacts to special-status plant species observed and potentially occurring in the Project area. ~~1,538~~Approx. 1,612 acres of land would be disturbed (~~277acres~~ 349 acres permanent)	Same as Alternative 2	Greater land disturbance would increase potential impacts to listed plants. Route A: Approx. 1,651 ~~1,512~~ acres of land would be disturbed (364~~291~~ acres permanent). Route B: Approx. ~~1,539~~1,678 acres of land would be disturbed (354~~281~~ acres permanent). Route C: Approx. 1,729 ~~1,560~~ acres of land would be disturbed (362~~287~~ acres permanent). Route C Modified: Approx. 1,708 acres of land would be disturbed (383 acres permanent). Route D: Approx. 1,688 ~~1,549~~ acres of land would be disturbed (369 ~~290~~ acres permanent).	Greater land disturbance would increase potential impacts to listed plants Approx. 1,637 ~~1,563~~ acres of land would be disturbed (353~~280~~ acres permanent).	Reduced potential to affect listed plant species due to decreased land disturbance. Approx. 1,526 ~~1,456~~ acres of land would be disturbed (~~228~~ 303 acres permanent).	~~Greater~~ Potentially less land disturbance in natural areas would ~~increase~~ decrease potential impacts to listed plants (Segment 8A Option 1 slightly increases potential effects to listed plants, if present). Approx. 1,612 ~~1,538~~ acres of land would be disturbed (349~~277~~ acres permanent).

Table 3.4-1. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
Disturbance to threatened/ endangered and special-status wildlife	Same as above.	Potential effects on listed species including arroyo toad, California condor, California Gnatcatcher, least Bell's vireo, and Santa Ana Sucker. ~~For n~~Noise would occur from approx. ~~,~~ 361,703 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances, a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,612 acres of ground disturbing activities would result in habitat disturbance. ~~172.9~~172.5 miles of new transmission line would be added.	Same as Alternative 2 ~~For n~~Noise~~,~~ would occur from approx. 361,586 onroad vehicle trips ~~are estimated to occur~~ as part of construction. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances, a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,612 acres of ground disturbing activities would result in habitat disturbance. ~~173.3~~172.9 miles of new transmission line would be added.	Greater land disturbance, including effects to riparian habitat and coastal sage scrub in the Chino Hills, would increase potential impacts to listed species such as least Bell's vireo and California gnatcatcher. Noise would occur from approx.~~For noise,~~ ~~343,866~~340,332 (Route A), ~~358,186~~348,691 (Route B), ~~374,013~~357,930 (Route C), 400,772 (Route C Mod.), or ~~365,722~~353,091 (Route D) onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Route A: Approx. 230.6 ~~231.9~~ miles of new and upgraded roads and ~~1,512~~1,651 acres of ground disturbing activities. ~~157.2~~156.8 miles of new transmission line would be added Route B: Approx. 227.3 ~~228.5~~ miles of new and upgraded roads and ~~1,539~~1,678 acres of ground disturbing activities. ~~160.8~~160.4 miles of new transmission line would be added Route C: Approx. 231.1~~231.8~~ miles of new and upgraded	Same as Alternative 2 Noise would occur from approx.~~For noise,~~ 418,912 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances, a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,563~~1,637 acres of ground disturbing activities would result in habitat disturbance. ~~172.9~~172.5 miles of new transmission line would be added.	Decreased land disturbance ~~may~~ would decrease effects to listed wildlife such as arroyo toad, and would eliminate direct effects to Santa Ana sucker; however, use of access roads and helicopter staging areas may still affect some listed species. Use of helicopters may affect California condor, if present. ~~For n~~Noise would occur from~~,~~ 361,697 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately ~~42,014~~43,909 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances, a~~Approximately 181.9 ~~183.2~~ miles of new and upgraded road and 1,526 ~~1,456~~ acres of ground disturbing activities would result in habitat disturbance. ~~172.9~~172.5 miles of new transmission line would be added.	~~Greater~~ Potentially less land disturbance, including effects to riparian habitat and coastal sage scrub in the vicinity of the Whittier Narrows, would ~~increase~~ slightly decrease impacts to listed species such as least Bell's vireo ~~and California gnatcatcher~~. ~~For n~~Noise would occur from approx.~~,~~ 362,861 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances, a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,612 acres of ground disturbing activities would result in habitat disturbance. ~~172.9~~172.5 miles of new transmission line would be added.

Table 3.4-1. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
				roads and ~~1,560~~1,729 acres of ground disturbing activities. ~~162.8~~159.0 miles of new transmission line would be added Route C Modified: 216.7 miles of new and upgraded roads and 1,708 acres of ground disturbing activities. 158.2 miles of new transmission line would be added Route D: Approx. 232.0 ~~233.2~~ miles of new and upgraded roads and 1,688 ~~1,549~~ acres of ground disturbing activities. ~~160.9~~160.5 miles of new transmission line would be added			
Transmission line strikes and electrocutions	Potential for transmission line strikes and electrocutions of birds ~~and bats~~.	Potential for transmission line strikes and electrocutions of birds ~~and bats~~. ~~172.9~~172.5 miles of new transmission line would be added.	Slightly longer transmission line route would result in slightly higher potential for line strikes and electrocutions. ~~173.3~~172.9 miles of new transmission line would be added.	Greater length of transmission line in open space would result in slightly higher potential for line strikes and electrocutions. ~~157.2~~156.8 (Route A), ~~160.8~~160.4 (Route B), ~~162.8~~159.0 (Route C), 158.2 (Route 4C Modified), ~~160.9~~160.5 (Route D) miles of new transmission line would be added.	Underground portion of transmission line in Chino Hills would result in lower potential for line strikes and electrocutions. ~~172.9~~172.5 miles of new transmission line would be added.	Same as Alternative 2	Greater length of 66-kV line in open space would result in slightly higher potential for line strikes and electrocution; however, underground portions would reduce potential for line strikes and electrocution. ~~172.9~~172.5 miles of new transmission line would be added.
Interference with wildlife movement	Potential projects would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and	~~For n~~Noise~~,~~ would occur from approx. 361,703 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project. Up to	~~For n~~Noise~~,~~ would occur from approx. 361,586 onroad vehicle trips ~~are estimated to occur~~ as part of construction. Up to	~~For n~~Noise~~,~~ would occur from approx. 343,866~~340,332~~ (Route A), 358,186~~348,691~~ (Route B), 374,013~~357,930~~ (Route C), 400,772 (Route C Mod.), or 365,722~~353,091~~ (Route D) onroad vehicle	~~For noise~~Noise would occur from approx.~~,~~ 418,912 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project.	~~For noise,~~Noise would occur from approx. 361,697 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project.	~~For n~~Noise would occur from approx.~~,~~ 362,861 onroad vehicle trips ~~are estimated to occur~~ as part of construction of this Project.

Table 3.4-1. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
	subsequently introduce similar types of impacts	approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,612 acres of ground disturbing activities would result in habitat disturbance. Activities ~~would~~ are expected to occur during ~~any hours of the day~~daylight hours; ~~or potentially the night~~however, traffic in and out of the site may also occur after dark~~,~~. ~~thus~~ Vehicular impacts ~~with vehicles or deterrents~~ to wildlife ~~movement~~ would occur.	approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,612 acres of ground disturbing activities would result in habitat disturbance. Activities ~~would~~ are expected to occur during ~~any hours of the day~~daylight hours; ~~or potentially the night~~however, traffic in and out of the site may also occur after dark~~,~~. ~~thus~~ Vehicular impacts ~~with vehicles or deterrents~~ to wildlife ~~movement~~ would occur.	trips ~~are estimated to occur~~ as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Route A: Approx. 230.6 ~~231.9~~ miles of new and upgraded roads and 1,651 ~~1,512~~ acres of ground disturbing activities. ~~157.2~~156.8 miles of new transmission line would be added Route B: Approx. 227.3 ~~228.5~~ miles of new and upgraded roads and 1,678 ~~1,539~~ acres of ground disturbing activities. ~~160.8~~160.4 miles of new transmission line would be added Route C: Approx. 231.1 ~~231.8~~ miles of new and upgraded roads and 1,729 ~~1,560~~ acres of ground disturbing activities. ~~162.8~~159.0 miles of new transmission line would be added Route C Modified: 216.7 miles of new and upgraded roads and 1708 acres of ground disturbing activities. 158.2 miles of new transmission line would be added. Route D: Approx. 232.0 ~~233.2~~ miles of new and upgraded roads and 1,688	Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,637 acres of ground disturbing activities would result in habitat disturbance. Activities ~~would~~ are expected to occur during ~~any hours of the day~~daylight hours; ~~or potentially the night~~however, traffic in and out of the site may also occur after dark~~,~~. ~~thus~~ Vehicular impacts ~~with vehicles or deterrents~~ to wildlife ~~movement~~ would occur. .	Up to approximately ~~42,014~~43,909 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~183.2~~181.9 miles of new and upgraded road and ~~1,456~~1,526 acres of ground disturbing activities would result in habitat disturbance. Activities ~~would~~ are expected to occur during ~~any hours of the day~~daylight hours; ~~or potentially the night~~however, traffic in and out of the site may also occur after dark~~,~~. ~~thus~~ Vehicular impacts ~~with vehicles or deterrents~~ to wildlife ~~movement~~ would occur.	Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. ~~For habitat disturbances,~~ ~~a~~Approximately ~~225.7~~224.5 miles of new and upgraded road and ~~1,538~~1,612 acres of ground disturbing activities would result in habitat disturbance. Activities ~~would~~ are expected to occur during ~~any hours of the day~~daylight hours; ~~or potentially the night~~however, traffic in and out of the site may also occur after dark~~,~~. ~~thus~~ Vehicular impacts ~~with vehicles or deterrents~~ to wildlife ~~movement~~ would occur.

Table 3.4-1. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
				~~1,549~~ acres of ground disturbing activities. ~~160.9~~160.5 miles of new transmission line would be added Activities ~~would~~ are expected to occur during ~~any hours of the day~~daylight hours; ~~or potentially the night~~however, traffic in and out of the site may also occur after dark~~,~~. ~~thus~~ Vehicular impacts ~~with vehicles or deterrents~~ to wildlife ~~movement~~ would occur.			

* Land disturbance under Alternative 3 would decrease by a factor of one structure within Segment 4. As such, the acres disturbed would continue to be almost identical to Alternative 2.

** Alternative 7 would have some additional temporary disturbance associated with underground construction of the 66-kV subtransmission lines in Segment 7 through the Duck Farm Project area and due to the overhead re-routing the 66-kV line around the Whittier Narrows Recreation area in Segments 7 and 8A. New access and spur roads may also be required for the new approximately 1,200 foot ROW for the San Gabriel River crossing within Segment 8A associated with the Whittier Narrows Overhead Re-Route.

3.4.2 Affected Environment

The Affected Environment section provides a detailed description of the baseline biological conditions of the proposed Project from southeastern Kern County to the Los Angeles Basin (Figure 2.1-1). The regional setting (Section 3.4.2.2) and local setting (Section 3.4.2.3) for the proposed Project is provided below. Vegetation types within the proposed Project are described for the purpose of characterizing the botanical resources and wildlife habitat values. Biotic habitats suitable for the occurrence of plant and wildlife species of special status (State- and federally listed threatened and endangered species, federal candidate species, California Native Plant Society List species, California Species of Special Concern, and FS Sensitive species) are also described. Sections 3.4.2.4 through 3.4.2.8 discuss the setting for each proposed Project alternative. Management Indicator Species are discussed in Section 3.4.2.3.2.

Information for this Project was collected from already existing reports, books and manuals, as well as field collection of new data specific to the Project. Details can be found in the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~). A complete list of species evaluated is found in the *Biological Resources Specialist Report*. Of the 625 species evaluated, 182 are considered within or near the Project area.

3.4.2.1 Baseline Data Collection Methodology

The *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~) provides a summary of the methodology used to assess biological resources within the proposed Project. The approach for this process was to utilize all available data related to biological resources to the extent possible, and to independently review, verify, and supplement this data in order to compile a concise and accurate description of the baseline biological conditions.

3.4.2.2 Regional Setting

The proposed Project traverses several geographical and ecological zones. From its northernmost extent near Tehachapi, the Project passes through the City of Lancaster, the City of Palmdale, and the Antelope Valley in the western Mojave Desert, spans the Sierra Pelona and San Gabriel Mountains within the ANF, and extends through the San Gabriel Valley to the City of Ontario. Collectively, these areas contain a diversity of flora and fauna that include many rare, threatened, and endangered plants and animals, and comprise rare vegetation communities.

For purposes of this EIR/EIS, the proposed Project is evaluated regionally with location-specific discussions of habitats, and special-status plant and animal species. Due to the diversity of habitats within the proposed Project area, the Project was divided according to dominant habitat characteristics and the baseline conditions are described in relation to the following three regions:

- **Northern Region**. This region includes all portions of the proposed Project located between the Windhub Substation south of Tehachapi in southern Kern County and the northern boundary of the ANF, located in northern Los Angeles County. This region includes Segments 4, 5, and 10, northern portions of 6 and 11, substation construction (Whirlwind), and substation improvements (Antelope and Vincent).
- **Central Region**. This region includes all portions of the proposed Project located in the ANF, including Segment 6 and the majority of Segment 11.
- **Southern Region**. This region includes all portions of the proposed Project located south of the ANF within Los Angeles County and San Bernardino County. This region includes Segments 7 and 8, southern portions of Segment 11, and all associated substation improvements (Gould, Mesa, and Mira Loma).

3.4.2.2.1 Northern Region

The Northern Region of the proposed Project includes Segments 4, 5, 10, and the northernmost portions of 6 and 11 (Figure 3.4-1 at the end of Section 3.4). These Tehachapi Foothills and Western Antelope Valley segments commence at the west end of the Mojave Desert, where the tip of the Antelope Valley rises west towards Tejon Pass at an elevation of approximately 3,100 feet. The composition of the vegetation in this area is strongly influenced by the geography and geology of the region.

Landform processes, such as uplift, bedrock decomposition, erosion-deposition, and alluvium stratification, have produced a semicircular fan along the western edges of the Antelope Valley. Some of the soil formations provide low competition habitats for a rich assemblage of native annual plant species. These specialized plant habitats include some of California's most colorful wildflower displays.

The general region is botanically diverse, wedged between the desert, the Sierra Nevada, the Great Central Valley, and the Transverse Ranges. Though varied floristic influences exist in the Valley, this area has been subject to repeated disturbance from historic land uses such as farming, grazing, and infrastructure development. Low-lying areas may support stream crossings and wetlands, particularly in the vicinity of the San Andreas Fault Zone, where groundwater-associated marshes and ponds are relatively common.

This area is located within the juncture of different ecological regions: the Northern Great Basin, Transverse and Coast Ranges, West Mojave and Sonoran deserts, Tehachapi Mountains, Sierra Nevada, and Great Central Valley, and supports a variety of native and introduced plants and wildlife.

The western section of the region contains large areas of disturbed annual grasslands dominated by non-native grasses and forbs and is important as raptor foraging and wintering habitat. Near the eastern edge of the region the area supports more xeric species including Mohave ground squirrel. Some of the listed species that either have been observed or may occur in the Project area include least Bell's vireo, Swainson's hawk, Mohave ground squirrel, California red-legged frog, desert tortoise, and rare plants such as San Fernando Valley spineflower, alkali Mariposa lily, and short-joint beavertail cactus.

3.4.2.2.2 Central Region

The Central Region of the proposed Project consists of the ANF within the San Gabriel Mountains and includes Segment 6 and most of Segment 11 (Figure 3.4-2 at the end of Section 3.4). Segments 6 and 11 cross rugged portions of the ANF. The San Gabriel Mountains are part of the Transverse Ranges, which lie on an east-west axis. These mountains are characterized by steep, rugged terrain and deep canyons, as well as numerous creeks, streams, and rivers. The ANF extends across most of the San Gabriel Mountains, and constitutes a regionally rare expanse of wildland habitat.

The 2005 Forest Plan indicates the mountains and foothills of southern California are home to approximately nine native species of fish, 18 amphibians, 61 reptiles, 299 birds, 104 mammals, 2,900 vascular plants and an unknown number of species of invertebrate animals and non-vascular plants. Some of these species are endemic to the ANF, and some have special status as federally listed threatened, endangered, proposed, candidate, or FS Sensitive species.

The Project alignment crosses many areas that provide suitable habitat for several FS Sensitive species including the Mt. Gleason Indian Paintbrush, California spotted owl, Santa Ana speckled dace, pallid bat, and San Bernardino mountain kingsnake. It is possible to find California condor, eagles, and other raptor species.

3.4.2.2.3 Southern Region

The Southern Region of the proposed Project occurs in the Los Angeles Basin and includes Segments 7, 8, and the southernmost portion of Segment 11 (Figure 3.4-3 at the end of Section 3.4). Ongoing urbanization and residential housing development continue to be the dominant feature for much of this area. However, the proposed transmission alignment would parallel or cross several major biological features including the San Gabriel River, the Whittier Hills open space, Puente Hills Landfill Native Habitat Preservation Authority, and other portions of the Puente and Chino Hills.

These areas have become increasingly important to wildlife as they provide large areas of habitat within an urban setting. In addition, these areas provide movement corridors between the Chino Hills and the Cleveland National Forest. One important species documented in these areas is the federally listed California gnatcatcher. In addition, the Puente-Chino Hills Wildlife Corridor supports over 100 different species including deer, coyotes, foxes, bobcats, hawks, and owls. Vegetation in this area is dominated by coastal sage scrub, California walnut woodlands, sycamore and oak forests, freshwater marsh, and non-native grasslands.

Much of Segment 8 is located along the spine of the Chino Hills. This area supports both highly urbanized areas and large sections of wild lands, such as Tonner and Carbon Canyons. Residential communities in some locations directly abut the existing utility corridor. Broad areas within the Chino Valley support activities including dairy farming, industrial, and residential. Portions of this area remain as a link for wildlife movement from the Cleveland National Forest and the Prado River basin. The diversity and productivity of the Santa Ana River riparian system and adjacent upland habitat provide opportunities for a variety of wildlife species, many of which are dependent on these ecosystems for some or all of their habitat requirements. Riparian and upland habitats provide a variety of foraging, nesting, and cover opportunities, as well as water resources, for a variety of wildlife species that occur both within the riparian habitat as well as adjacent upland habitats.

Wildlife corridors provide a variety of functions and can include habitat linkages between natural areas; provide greenbelts and refuge systems; and divert wildlife across permanent physical barriers to dispersal such as highways and dams by roadway underpasses and ramps. In the Chino Hills area, data indicates that fragmentation of habitat and a reduction in useable wildlife corridors can affect the population dynamics of predators including bobcat, coyote, and mountain lions (Riley et. al., 2003; Dickson et. al., 2005). The amount and distribution of suitable habitat is an essential element to consider for the management of wildlife. In fact, some species require, and are often limited to, unique vegetation types for breeding or foraging. Some of the other species that occur in this segment include Swainson's hawk, burrowing owl, least Bell's vireo, and peregrine falcon.

3.4.2.2.4 Wildlife Corridors and Special Linkages

Linkages and corridors facilitate regional animal movement and are generally centered around waterways, riparian corridors, flood control channels, contiguous habitat, and upland habitat. Drainages generally serve as movement corridors because wildlife can move easily through these areas, and fresh water is available. Corridors also offer wildlife unobstructed terrain for foraging and for dispersal of young individuals. Ridgelines that occur throughout the Project area may also serve as movement corridors.

Riparian corridors remain a common pathway utilized by many species because they typically provide cover, foraging opportunities, and water. For many species, such as southwestern willow flycatcher or Santa Ana sucker, this is the only habitat type that they utilize. However, as the movements of wildlife

species are more intensively studied using radio-tracking devices, there is mounting evidence that some wildlife species do not necessarily restrict their movements to some obvious landscape element, such as a riparian corridor. For example, radio-tracking and tagging studies of newts, California red-legged frogs, and western pond turtles found that long-distance dispersal involved radial or perpendicular linear movements away from a water source with little regard to the orientation of the assumed riparian "movement corridor," but towards suitable riparian or upland wintering habitat (Fellers and Kleeman, 2007; Semlitsch, 1998; Reese and Welsh, 1997).

In general the following corridor functions can be utilized when evaluating impacts to wildlife movement corridors:

a. **Movement corridors** are physical connections that allow wildlife to move between patches of suitable habitat. Simberloff et al. (1992) and Beier and Loe (1992) correctly state that, for most species, we do not know what corridor traits (length, width, adjacent land use, etc.) are required for a corridor to be useful. But, as Beier and Loe (1992) also note, the critical features of a movement corridor may not be its physical traits but rather how well a particular piece of land fulfills several functions, including allowing dispersal, plant propagation, genetic interchange, and recolonization following local extirpation.

b. **Dispersal corridors** are relatively narrow, linear landscape features embedded in a dissimilar matrix that links two or more areas of suitable habitat that would otherwise be fragmented and isolated from one another by rugged terrain, changes in vegetation, or human-altered environments. Corridors of habitat are essential to the local and regional population dynamics of a species because they provide physical links for genetic exchange and allow animals to access alternative territories as dictated by fluctuating population densities.

c. **Habitat linkages** are broader connections between two or more habitat areas. This term is commonly used as a synonym for a wildlife corridor (Meffe and Carroll, 1997). Habitat linkages may themselves serve as source areas for food, water, and cover, particularly for small- and medium-size animals.

d. **Travel routes** are usually landscape features, such as ridgelines, drainages, canyons, or riparian corridors within larger natural habitat areas that are used frequently by animals to facilitate movement and provide access to water, food, cover, den sites, or other necessary resources. A travel route is generally preferred by a species because it provides the least amount of topographic resistance in moving from one area to another yet still provides adequate food, water, or cover (Meffe and Carroll, 1997).

e. **Wildlife crossings** are small, narrow areas of limited extent that allow wildlife to bypass an obstacle or barrier. Crossings typically are manmade and include culverts, underpasses, drainage pipes, bridges, and tunnels to provide access past roads, highways, pipelines, or other physical obstacles. Wildlife crossings often represent "choke points" along a movement corridor because useable habitat is physically constricted at the crossing by human-induced changes to the surrounding areas (Meffe and Carroll, 1997).

3.4.2.3 Alternative 2: SCE's Proposed Project

3.4.2.3.1 Northern Region

The northernmost stretch of the proposed ROW, consisting of Segment 10, is located within the southern boundary of the Tehachapi Wind Resource Area (TWRA), an area of transition between the foothills of the Tehachapi Mountains to the north and northwest and the western Mojave Desert. Much of the area is characterized by a gradually sloping alluvial plateau crossed by numerous desert washes, with several

rocky hillocks scattered along the plain. Mining operations, grazing, OHV use, camping, hunting, and scattered development, including wind farms, all occur in the general area.

As Segment 10 trends in a southwest direction, it traverses an area dominated by open space desert habitat with scattered and isolated rural residential properties. A large cement production facility is located just northwest of the proposed ROW in this area. Several existing dirt access roads comprise a patchwork mosaic throughout the area, some better maintained than others. Much of this segment parallels the Los Angeles aqueduct, which lies underneath Aqueduct Road, a moderately maintained paved road. Segment 10 continues northwest where it traverses Cottonwood Creek and ultimately intercepts Segment 4 at the proposed Whirlwind Substation site.

At this point, Segment 4 travels southeast and crosses the county line between Kern and Los Angeles Counties at West Avenue A. This area also lies within the alluvial plateau located at the foothills of the Tehachapi Mountains to the northwest. However, as Segment 4 continues southeast and into Los Angeles County, the landscape transitions to an area dominated by agricultural fields, many of which appear fallow, and rural development. Roads in this area consist of a fairly even distribution of dirt access roads and those that are paved and relatively well-maintained. As the segment traverses this area and spans the western Antelope Buttes, the Antelope Valley California Poppy Reserve occurs approximately one mile to the west. Beyond this point, portions of Segment 4 enter the western outskirts of the City of Lancaster as it terminates at the existing Antelope Substation.

From the Antelope Substation, Segment 5 continues towards the southeast and traverses an area of similar open space, agricultural fields, and rural development as it crosses through western Lancaster and the City of Palmdale. At approximately 4 miles southeast of the Antelope Substation, Segment 5 intersects the California Aqueduct and transitions from relatively flat topography to the Portal Ridge and Ritter Ridge foothills, which are characterized by gently rolling to moderately steep slopes dominated by sparse vegetation. Due to the rugged terrain throughout much of this area, access roads are limited and situated some distance from the ROW at some locations. However, given the proximity to urban development, many of these are well-maintained and routinely traveled. Several small single-family residential communities occur on each side of the proposed ROW throughout this area. Segment 5 terminates at the existing Vincent Substation, just south of where it intersects Highway 14 in the Soledad Pass.

The portions of Segments 6 and 11 that are north of the ANF boundary traverse areas similar to the southern portions of Segment 5.

Vegetation

The most common vegetation type in the Northern Region of the proposed Project is Mojave Creosote Brush Scrub (Table 3.4-2). Large areas of this habitat type are extremely disturbed, being grazed yearly by large herds of sheep (*Ovis aries*). Disturbed California Annual Grassland is the second most common vegetation type in the region, especially south of Rosamond Boulevard in the southern Antelope Valley. These areas of grassland also support wildflower fields with spectacular displays of color during good rainfall years (observed during the 2008 spring wildflower bloom). These grasslands were previously fallow agricultural fields dominated primarily by cheat grass (*Bromus tectorum*) and other non-native grasses and occasionally interspersed with rubber rabbit brush (*Chrysothamnus nauseosus*). The third most abundant vegetation type is Mojave Juniper Woodland and Scrub, especially in the Leona Valley west of the city of Palmdale. Other relatively common vegetation types within the region include Mojave Mixed Woody Scrub, Desert Bunchgrass Mix, and Desert Saltbush Scrub in the Antelope Valley, and Mixed Chaparral in the foothills of the San Gabriel Mountains. Disturbed areas in this region are often

dominated by non-native species, although, in other cases, rubber rabbitbrush, (a native, primary succession species) dominates disturbed areas.

State-protected habitats that occur in the Northern Region include Southern Cottonwood Willow Riparian Forest (along Amargosa Creek), Joshua Tree Woodland, and Desert Wash. The USGS National Wetland Inventory (NWI) maps depict numerous, small (0.3 to 1.0 acre) inland marshes and wetlands that may be temporarily flooded, particularly within the northern portion of the Northern Region.

Common Wildlife

Common wildlife species occurring throughout the Northern Region are indicative of the high desert environments and agricultural centers of southern California. These species are typically well-adapted to the arid conditions that define this portion of the Project alignment or are generalists, capable of exploiting a broad spectrum of habitats. Species observed during surveys in the Northern Region include a variety of birds, such as common raven (*Corvus corax*), red-tailed hawk (*Buteo jamaicensis*), northern mockingbird (*Mimus polyglottos*), ash-throated flycatcher (*Myiarchus cinerascens*), and California quail (*Callipepla californica*). Other bird species that are likely to occur include western scrub jay (*Aphelocoma californica*), American kestrel (*Falco sparverius*), house finch (*Carpodacus mexicanus*), and killdeer (*Charadrius vociferus*). Mammal species that were observed during surveys include bobcat (*Lynx rufus*), black-tailed jackrabbit (*Lepus californicus*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), and desert cottontail (*Sylvilagus audubonii*). Common mammal species that would be expected to occur in the Northern Region include coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), ~~round-tailed ground-squirrel (*Spermophilus tereticaudus*),~~ and striped skunk (*Mephitis mephitis*). The Northern Region provides excellent habitat for a variety of reptiles. Reptile species observed during surveys or expected to occur include western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), desert spiny lizard (*S. magister*), desert iguana (*Dipsosaurus dorsalis*), and western rattlesnake (*Crotalus viridis*). Chuckwalla (*Sauromalus ater*), red racer (*Coluber constrictor*), common kingsnake (*Lampropeltis getula*), gopher snake (*Pituophis catenifer*), and western whiptail lizard (*Aspidoscelis tigris*) are also commonly found in the Northern Region. A complete list of wildlife species observed during surveys conducted in the entire Project area is included as Appendix K of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~).

Vegetation Types

Eighteen vegetation types were mapped within the Northern Region of the proposed Project alignment. Table 3.4-2 lists these habitat types including acres and percentage of total acreage within the proposed Project. Full descriptions of each of these vegetation types are provided in Appendix H of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~) and vegetation maps are provided (Figure 3.4-4 located in the Map & Figure Series Volume).

Table 3.4-2. Vegetation Types Occurring in the Northern Region

Habitat Type	Acres	Percentage of Total Acreage
Mojave Creosote Bush Scrub	2792.50	30.67%
California Annual Grassland	1968.30	21.62%
Mojave Juniper Woodland and Scrub	1066.45	11.71%
Barren/Developed	700.24	7.69%
Agriculture	556.59	6.11%
Rabbitbrush Scrub	407.93	4.48%
Mojave Mixed Woody Scrub	349.58	3.84%
Desert Bunchgrass Grassland	324.93	3.57%

Table 3.4-2. Vegetation Types Occurring in the Northern Region		
Habitat Type	Acres	Percentage of Total Acreage
Desert Saltbush Scrub	291.65	3.20%
Desert Wash	260.00	2.86%
Mixed Chaparral	192.09	2.11%
Joshua Tree Woodland	142.02	1.56%
Big Sagebrush Scrub	26.39	0.29%
Mojave Pinyon Woodland	15.44	0.17%
Southern Cottonwood Willow Riparian Forest	5.99	0.07%
Ruderal Grassland	3.65	0.04%
Deerweed/Chia Herbaceous Field, Recently Burned	1.69	0.02%
Mojavean Pinyon and Juniper Woodland, Recently Burned	0.23	0.00%
Total	9105.67	100.00%

Special-status Species

Special-Status Plant Species

Thirteen special-status plant species have the potential to occur within the Northern Region of the proposed Project. Table 3.4-6 lists these species, their status, and their potential for occurrence. Figure 3.4-5, located in the Map & Figure Series Volume, shows the locations of these species. Detailed accounts for these species are provided in Appendix E of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~).

Special-Status Wildlife Species

Twenty-eight special-status wildlife species have the potential to occur within the Northern Region of the proposed Project. Table 3.4-7 lists these species, their status, and their potential for occurrence. Figure 3.4-5, located in the Map & Figure Series Volume, shows the locations of these species. Detailed accounts for these species are provided in Appendix J of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~).

Wildlife Movement

The Northern Region is located within an area that supports the confluence of four major ecoregions, including the Great Central Valley, just across the Tehachapi Mountains to the northwest; the Sierra Nevada to the north, of which the Tehachapi Mountains represent the southernmost reach; the expansive Mojave Desert to the east; and the South Coast region to the south and southwest. Vegetation communities are quite unique where ecoregions meet; for instance, Joshua tree woodlands intermix with oak, juniper, and pine in a transition zone on the Mojave side of the mountains (Penrod, et al., 2003). Some of the important linkage and movement corridors that have been identified in the general region include the Tehachapi Connection (Penrod, et al., 2003), the Antelope Valley (County of Los Angeles, 2008), and the San Andreas Rift Zone Special Ecological Area (County of Los Angeles, 2008).

Just north of the Project area, the Tehachapi Mountains provide an important linkage for a variety of wildlife species, although some may not occur at the Project site, between the southern Sierra Nevada and the mountainous regions of the Los Padres and Angeles National Forests. In fact, the Tehachapi Mountains represent the sole continuous block of habitat in the region connecting these vital areas. Due to the functional value of this area as a wildlife movement corridor, it has been included as a key component (Tehachapi Connection) of the South Coast Missing Linkages Project (SCMLP). The SCMLP is a collaborative effort among federal and State agencies and non-governmental organizations to identify

and conserve landscape-level habitat linkages in order to protect essential biological and ecological processes in the South Coast Ecoregion. This project is led by South Coast Wildlands (SCW), a non-profit organization that works with regional ecologists, regulatory agencies, land managers and planners, and other conservation organizations to develop and implement a regional conservation strategy. To date, the SCMLP has identified 15 landscape linkages that are considered irreplaceable and imminently threatened. The Tehachapi Connection is one of these 15 priority linkages, whose protection is crucial to maintaining ecological and evolutionary processes (SCW, 2008). Some of the key species known to utilize this linkage include mule deer, mountain lion, California spotted owl, and Tehachapi pocket mouse (Penrod et. al., 2003). Although the linkage design (as defined by the SCMLP) for the Tehachapi Connection lies to the north of the Project area, many of the same habitats and water bodies transition from the linkage design area into the Project area.

According to the ANF Land Management Plan, impediments to wildlife movement in the region include urban development, Sierra Highway, and State Highway 14, which is by far the greatest barrier for movement between the San Gabriel Mountains, south of State Highway 14, and the Santa Susana Mountains to the north. The national forest is active in regional planning efforts to establish a wildlife linkage connecting these vital areas.

As the Antelope Valley extends northeast from the boundary of the ANF towards Edwards Air Force Base, various geographical features provide major habitat linkage opportunities and movement corridors for a variety of wildlife species. Beneficiaries of these features particularly include wide-ranging species and ecological generalists, such as coyote, gray fox, raccoon, and bobcat, which have the ability to move across vast expanses of open space and exploit a diversity of habitats. For such species, areas that provide adequate qualities for wide-ranging movements serve as an important component of long-term genetic exchange. For smaller, less mobile species, such as ~~burrowing owl and~~ Mohave ground squirrel, linkages within the Antelope Valley can facilitate movement during seasonal or population dispersal.

The San Andreas Rift Zone has been proposed as a Special Ecological Area (SEA) by the County of Los Angeles (County of Los Angeles, 2008) due to its diverse assemblage of vegetation types that result from the unique location and large variation of elevation and topography through the area. This SEA is located in the western portion of the Antelope Valley and includes a small portion of the western Tehachapi foothills before extending southeast towards large portions of Portal Ridge and the Leona Valley, including Amargosa Creek and a majority of its watershed. The San Andreas Rift Zone SEA includes several important linkages for wildlife movement. These include the western Tehachapi foothills which may serve as an important topographic reference for migrating birds, as well as essential high elevation foraging grounds along migratory routes (County of Los Angeles, 2008). Several large drainages occur in the region as they extend to the floor of the Antelope Valley and provide important linkages for wildlife travelling between upland habitats and the valley floor. Amargosa Creek provides an essential riparian corridor, in an otherwise arid environment, linking east-west movement through the Liebre Mountains, Portal Ridge, and Ritter Ridge. The San Andreas Rift Zone SEA is utilized by a number of listed wildlife species, including California red-legged frog, mountain plover, southwestern willow flycatcher, and Mohave ground squirrel.

On a regional scale, the area surrounding the Northern Region supports a variety of important habitat linkages and wildlife movement corridors, including the Tehachapi Connection, the Antelope Valley, and the San Andreas Rift Zone SEA. The Project site, however, occurs outside of any designated or arbitrary boundaries for important wildlife corridors and linkages that have been defined in the region. Furthermore, the proposed alignment traverses several barriers that are known to impede wildlife

movement, including paved roadways such as Highways 14 and 58, the Los Angeles and California Aqueducts, and expansive agricultural fields.

3.4.2.3.2 Central Region

The Central Region is comprised of the portions of Segments 6 and 11 that traverse the ANF in a generally north-south direction. These segments cross the northern boundary of the ANF in an area characterized by relatively arid conditions and landscapes due to the rain-shadow effect of the San Gabriel Mountains. As each segment extends south towards the mountainous regions of the ANF, they traverse areas dominated by steep topography and span a diverse assemblage of native vegetation communities and a complex network of existing forest and non-forest access roads. Additionally, several USGS blue-line streams and their tributaries are intersected by the existing ROW and access roads.

Segment 6 enters the ANF in a generally northwest direction through the area of Kentucky Springs. ~~From this point, much of Segment 6 roughly parallels Angeles Forest Highway as it rises in elevation along the northern slopes of the ANF. The first significant rise along the ROW occurs at the ridgeline that comprises the northern flank of Aliso Canyon.~~ A few scattered, private in-holdings occur along this portion of the segment, including Wagonwheel Ranch and Gold Queen Mine. Some of the major features occurring in this area include paved roads, such as Aliso Canyon and Mount Gleason Road, and Aliso Spring and Mill Creek Summit picnic grounds. Access through this northern portion of Segment 6 would primarily occur along FS Road 4N41, which generally follows the existing ROW to its termination at Gold Queen Mine. From this location, the ROW trends towards the southeast, still roughly paralleling Angeles Forest Highway. Access from this point would generally occur along FS Road 4N18. Mill Creek, an intermittent drainage through this area, is located between Angeles Forest Highway and FS Road 4N18 and crosses 4N18 in a few locations. As the segment travels farther south along 4N18, it ~~traverses Rabbit Peak and~~ intersects Monte Cristo Creek, another intermittent drainage. Several mines occur in the area just south of Monte Cristo Creek, including Black Crow, Gold Bar, and Black Cargo. From this area, Segment 6 ~~trends to the southeast as it diverts from Angeles Forest Highway and~~ enters Upper Big Tujunga Canyon. As this portion of the segment parallels Upper Big Tujunga Road, it intersects Big Tujunga and Alder Creeks and several respective tributaries. Access in this area would be limited to Upper Big Tujunga Road, FS Road 3N20, and an unnamed FS road out of Shortcut Fire Station. The segment spans Angeles Crest Highway just east of its junction with Upper Big Tujunga Road. Beyond this point, the segment ~~continues southeast and~~ lies adjacent to the San Gabriel Wilderness Area, which is located just to the east. FS Roads 2N23 and 2N24 would provide access to locations along this portion of Segment 6. FS Road 2N24 ~~initiates at Red Box picnic grounds, approximately two miles west of the ROW, and heads east as it parallels and crosses the West Fork San Gabriel River and several minor tributaries until it passes through West Fork campground. However, this portion of the road would not be used as a construction access route. At this point, the road diverts towards the south as it travels through the Newcomb Pass area and eventually~~ intersects the ROW near the junction with 2N23 at Newcomb Pass, which would be the primary access route to this portion of the segment. From this location, 2N24 follows the ROW through several canyons that lie just south of Cogswell Reservoir, including Tumbler Canyon, Glen Canyon, and Butterfield Canyon. Just northeast of Monrovia Peak, access would occur along FS Roads 2N30 and 1N36, with each of these leading to the southern boundary of the ANF. Access would also occur along the Cogswell Reservoir access road (2N25.1) and FS Road 2N25.2, which intersects FS Road 2N24.

Segment 11 crosses the northern boundary of the ANF ~~in a south-southwest direction,~~ approximately one mile west of Segment 6. Access in this area would occur along FS Road 4N24 as it generally follows the

ROW. North of Aliso Canyon, the ROW and 4N24 traverse an area dominated by recently burned herbaceous fields. A few minor washes cross 4N24 in this area, but appear to support only occasional seasonal flows. ~~Upon reaching Aliso Canyon Road, the ROW intersects a large private in-holding at Beartrap Canyon that includes the Niles and Montgomery Ranches. The ROW extends further south along the ridgeline between Gleason and Beartrap Canyons and eventually crosses Big Buck campground and the Pacific Crest Trail, just north of Mount Gleason Road.~~ FS Road 4N24 terminates at Mount Gleason Road. South of Mount Gleason Road, access would occur along FS Road 3N27 as it generally follows the ROW to Big Tujunga Creek. At this point, the road has been washed out and is no longer passable by vehicles. This general area is characterized by relatively steep, north-facing slopes dominated by chaparral communities. Several blue-line drainages occur throughout this portion of the segment and cross 3N27, including North Fork Mill Creek, Fall Creek, and Big Tujunga Creek. As the ROW approaches Big Tujunga Canyon Road, Big Tujunga Reservoir occurs just to the west. ~~Beyond Big Tujunga Road, the ROW intersects Angeles Forest Highway and Angeles Crest Highway to the south, respectively.~~ Due to steep topography, access in the area between Big Tujunga Canyon Road and Angeles Crest Highway is extremely limited. ~~As the ROW spans this area, it crosses Clear Creek and then dramatically rises in elevation just west of Hoyt Mountain.~~ Access is available just north of Angeles Crest Highway along FS Road 2N79. Elevations begin to descend south of Angeles Crest Highway and access would occur along FS Road 2N75 and 2N76. In this area the ROW parallels the western forest boundary between forest land and portions of unincorporated Los Angeles County, just north of the City of La Cañada Flintridge. Upon connecting to the Gould Substation, the ROW extends to the east and traverses a series of canyons along the southern boundary of the ANF, including Fern Canyon, Prieto Canyon, Millard Canyon, and Rubio Canyon. Throughout this area, the ROW crosses stretches of private in-holdings interspersed within the ANF. This portion of the segment would be accessed through a variety of roads that initiate south of the forest boundary. Segment 11 ultimately exits the forest boundary at Eaton Canyon just north of Altadena.

Helicopter Construction on the Angeles National Forest

Approximately 33 towers would be constructed by helicopter on the ANF. SCE has identified ~~12~~ 13 helicopter staging areas that would be necessary to support helicopter construction activities (Figure 2.2-83). These sites average approximately four acres in size and are described in detail in the *TRTP Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~). Improvements at each of the staging and landing areas would be required and would include clearing of vegetation, and potential grading and cut and fill activities. The removal of pine trees of various age classes and potentially oaks, and/or other trees would be necessary in order to facilitate helicopter operations at several of the sites.

Vegetation

The majority of the proposed Project in the Central Region consists of Mixed Chaparral (Table 3.4-4). Canyon Oak Forest and Bigcone Douglas Fir-Canyon Oak Forest are the second and third most common vegetation types in the region, respectively. Both of these forest types are especially common on the north-facing slopes in the ANF. The next most abundant vegetation type is Chamise Chaparral, followed by two vegetation types that were recently burned (Deerweed/Chia Herbaceous Field, Recently Burned and Mojavean Pinyon and Juniper Woodland, Recently Burned). Coastal vegetation types restricted to the southern slope of the ANF include Southern Coast Live Oak Riparian Forest and Coastal Sage Scrub. On the drier northern slope, desert vegetation is more common, including Mojave Pinyon Woodland, Mojave Juniper Woodland and Scrub, Desert Wash, and Big Sagebrush Scrub. Several riparian vegetation types

are located in deeper canyons along rivers or creeks: Southern Willow Scrub, Southern Sycamore Alder Riparian Woodland, Southern Cottonwood Willow Riparian Forest, and Southern Arroyo Willow Riparian Forest. Non-native plants dominate three relatively uncommon vegetation types in the Project area: Nonnative Woodland, California Annual Grassland, and Barren/Developed. In addition, most of the access roads within the ANF, particularly near the Angeles Crest Highway and the Angeles Forest Highway, are easily accessed by off-road vehicles and support large populations of invasive plant species along the road margins.

State-protected or regulated habitats that occur in the Central Region include Southern Cottonwood Willow Riparian Forest, Southern Sycamore Alder Riparian Woodland, and Desert Wash. Numerous blue-line drainages appear within the Central Region, including Mill Creek in the north and Big Tujunga Creek and the San Gabriel River in the south. The USGS NWI maps depict numerous, small (0.3 to 1.0 acre) inland marshes and wetlands that may be temporarily flooded, within the Central Region.

Common Wildlife

The mountains and foothills of southern California are home to roughly 400 wildlife species, many of these occurring on the ANF. Some of these are wide-ranging mammals, including black bear (*Ursus americanus*), mountain lion (*Puma concolor*), and mule deer (*Odocoileus hemionus*). These species utilize a variety of habitats throughout the Central Region for breeding, denning, and foraging. Other mammals that occur on the ANF include coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), California ground squirrel (*S. beecheyi*), western gray squirrel (*Sciurus griseus*), and Botta's pocket gopher (*Thomomys bottae*). The diverse assemblage of vegetation communities on the ANF provides suitable breeding, nesting, and foraging habitat for a relatively exhaustive number of bird species, including Steller's jay (*Cyanocitta stelleri*), wrentit (*Chamaea fasciata*), mountain chickadee (*Poecile gambeli*), acorn woodpecker (*Melanerpes formicivorus*), and dark-eyed junco (*Junco hyemalis*). Red-tailed hawk (*Buteo jamaicensis*), common raven (*Corvus corax*), turkey vulture (*Cathartes aura*), and Cooper's hawk (*Accipiter cooperii*) are also relatively common in the Central Region. Among the reptile species commonly occurring on the ANF are side-blotched lizard (*Uta stansburiana*), sagebrush lizard (*S.graciosus*), western fence lizard (*S. occidentalis*), and southern alligator lizard (~~*Gerrhonotus*~~ *Elgaria* ~~*multicarinatus*~~*multicarinata*). Many perennial and intermittent drainages occur on the ANF and provide suitable breeding habitat for several amphibian species, including Pacific tree frog (~~*Hyla*~~ *Pseudacris hypochondriaca [regilla]*), California tree frog (~~*H*~~*P.cadaverina*), Monterey ensatina (*Ensatina* ~~*eschscholzia*~~ *eschscholzii* ~~*eschscholzia*~~*eschscholzii*), and coast range newt (*Taricha torosa torosa*).

Management Indicator Species

Twelve Management Indicator Species (MIS) are identified in the Angeles National Forest (ANF) Land and Resource Management Plan (LRMP) (USDA, 2005). Certain species, known as MIS, are identified as "indicators" of the health and function of the forest ecosystem in response to FS management activities. Project-level effects on MIS are analyzed and disclosed as part of the environmental analysis under the National Environmental Policy Act (NEPA).

MIS that occur in the Project area include mule deer, mountain lion, arroyo toad, song sparrow, California spotted owl, bigcone Douglas fir, and Coulter pine. Table 3.4-3 describes the MIS, their associated Management Indicators (MI), and the amount of habitat directly impacted by the proposed Project and Alternative 6 for each. See the *Management Indicator Species Analysis for the Tehachapi Renewable Transmission Project* for further details and analysis of impacts to MIS in the Project area.

Table 3.4-3. Impacts to Management Indicators and Management Indicator Species for the ANF			
Management Indicator (MI)	Management Indicator Species (MIS)	Acres Directly Impacted	
		Alternative 2	Alternative 6
Fragmentation	Mountain lion	272	203
Healthy Diverse Habitats	Mule deer	272	203
Aquatic Habitat	Arroyo toad	5~~7~~	16~~17~~
Riparian Habitat	Song Sparrow	0.7	0.07
Bigcone Douglas fir Forest	Bigcone Douglas fir	7	5
Coulter Pine Forest	Coulter pine	8	10
Montane Conifer Forest	California spotted owl	43	36

Vegetation Types

Vegetation on the ANF occurs in a mosaic of several communities that are influenced by a variety of factors, including slope aspect, soil type, precipitation, and topography.

Twenty-eight vegetation types were mapped within the Central Region of the proposed Project. Table 3.4-4 lists these habitat types including acres and percentage of total acreage within the proposed Project. Full descriptions of each of these habitats are provided in Appendix H of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 200~~8~~9) and vegetation maps are provided (Figure 3.4-4 located in the Map & Figure Series Volume).

Table 3.4-4. Vegetation Types Occurring in the Central Region		
Habitat Type	Acres	Percentage of Total Acreage
Mixed Chaparral	3061.15	~~46.51%~~ 46.46%
Barren/Developed	729.02	~~11.08%~~ 11.06%
Canyon Oak Forest	543.87	~~8.26%~~ 8.25%
Bigcone Douglas Fir-Canyon Oak Forest	511.80	~~7.78%~~ 7.77%
Chamise Chaparral	369.97	~~5.62%~~ 5.61%
Deerweed and Chia Herbaceous Field (Recently Burned)	271.35	4.12%
Mojavean Juniper and Pinyon Woodland (Recently Burned)	211.91	3.22%
Scrub Oak Chaparral	190.77	2.90%
Coulter Pine Forest	110.06	1.67%
Interior Live Oak Scrub	108.50	1.65%
Coast Live Oak Woodland	99.76	~~1.52%~~ 1.51%
Mojave Pinyon Woodland	62.92	~~0.96%~~ 0.95%
Coastal Sage Scrub	54.23	0.82%
Southern Sycamore Alder Riparian Woodland	48.46	0.74%
Southern Coast Live Oak Riparian Forest	43.79	~~0.67%~~ 0.66%
Mojave Juniper Woodland and Scrub	35.31	0.54%
Southern Willow Scrub	28.78	0.44%
Nonnative Woodland	18.48	0.28%
California Annual Grassland	13.14	0.20%
Southern Cottonwood Willow Riparian Forest	11.01	0.17%
California Bay Forest	10.00	0.15%
Big Sagebrush Scrub	9.98	0.15%
Desert Wash	9.17	0.14%
Recently Burned Mojavean Juniper and Pinyon Woodland	7.72	0.12%
Restoration – California Buckwheat Scrub	7.46	0.11%
Recently Burned, Early Successional	5.72	0.09%
Southern Arroyo Willow Riparian Forest	5.44	0.08%
Sparsely Vegetated Streambed	3.07	0.05%
Yellow Pine Forest (Plantation)	2.73	0.04%
Water	2.36	0.04%

Table 3.4-4. Vegetation Types Occurring in the Central Region		
Habitat Type	Acres	Percentage of Total Acreage
Ruderal Grassland	0.88	0.01%
Mule Fat Scrub	0.58	0.01%
Interior Live Oak Forest	0.02	0.00%
Total	~~6581.95~~ 6589.41	100.00%

Special-status Species

Special-Status Plant Species

Forty-six special-status plant species have the potential to occur within the Central Region of the proposed Project. Table 3.4-6 lists these species, their status, and their potential for occurrence. Figure 3.4-5, located in the Map & Figure Series Volume, shows the locations of special-status species. Detailed accounts for these species are provided in Appendix E of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~).

Special-Status Wildlife Species

Fifty-seven special-status wildlife species have the potential to occur within the Central Region of the proposed Project. Table 3.4-7 lists these species, their status, and their potential for occurrence. Figure 3.4-5, located in the Map & Figure Series Volume, shows the locations of special-status species. Detailed accounts for these species are provided in Appendix J of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~).

Wildlife Movement

The Central Region is located entirely within the boundaries of the ANF traversing an area dominated by steep, mountainous ridgelines and deep valleys. From a wildlife movement perspective, the ANF can be considered a large block of continuous open space surrounded by transitional ecotones, including the arid desert regions to the north and the highly developed San Gabriel Valley and Los Angeles Basin to the south. As a result, the ANF provides expansive habitat for wildlife movement and represents a broad, regional linkage between the San Bernardino Mountains to the east and the Santa Susana and Sierra Madre Mountains to the west. Subsequently, the FS has placed program emphasis, with respect to wildlife management, on minimizing the effects of urbanization, including protecting core areas such that these areas will continue to conserve biodiversity in an interconnected regional open space network. Additionally, habitat loss and fragmentation will be reduced through conserving and managing habitat linkages within, and where possible between, the national forests and other public and privately conserved lands (USDA, 2005).

Some of the areas that support important linkages and corridors on the ANF include: the Mount Wilson/Monrovia Peak area, which contains the region's largest and most continuous stands of bigcone Douglas fir, a productive habitat for spotted owl; the three forks (West, North, and East) of the Upper San Gabriel River, which provide suitable riparian and aquatic habitat linkages throughout much of their courses; the Mojave Front Country, which provides a transitional linkage between the desert habitats in the north with the mountainous regions of the ANF; and, Big Tujunga Canyon, which serves as an important corridor for wildlife movement between the southern front country of the ANF to areas upstream along Big Tujunga Creek. Continuous stands of native vegetation communities within these areas provide necessary habitat for a variety of species, including migratory stopovers for songbirds,

dispersal habitat for locally rare species like southwestern pond turtle, and breeding, nesting, and foraging habitat for raptors. In several areas throughout the ANF, steep topography and dense vegetation facilitate wildlife movement through riparian corridors. Additionally, it appears that large mammals, such as black bear, mountain lion, and mule deer, routinely use existing access roads as links between habitat patches and as possible microhabitats for foraging. This is evident in the significant amount of visual signs that were detected over the course of various surveys. Mountain lion and black bear tracks and scat were identified along access roads on numerous occasions in areas including Upper Big Tujunga Creek, Shortcut Saddle, and the West Fork San Gabriel River, and, a mountain lion kill was detected adjacent to an access road just north of Aliso Canyon. In addition, a mountain lion was sighted along the West Fork of the San Gabriel River, less than five miles west of segment 6, while accessing spotted owl survey sites (Mike San Miguel, pers. comm.). Black bears of multiple age classes were also observed on access roads in Monrovia Canyon and along Lynx Gulch. Various age classes of mule deer were also observed along several access roads throughout the forest and it is evident that they forage on plant species that occur along the road edges.

~~Although t~~The ANF constitutes important continuous open space which supports the migratory and dispersal requirements for a number of wildlife species~~, the proposed alignment through this region primarily occurs high atop mountain ridgelines and generally some distance from important riparian corridors located in the valleys below~~. ~~Furthermore~~However, various barriers that limit wildlife movement currently exist in many areas throughout the forest. These include major roadways, such as Angeles Crest, Angeles Forest, and San Gabriel Canyon Highways; existing utility corridors; a complex network of access roads, OHV roads, and trails; and, dams and reservoirs, such as Big Tujunga and Cogswell. Use of existing access roads to support construction will likely be the largest single factor affecting wildlife movement on the ANF.

3.4.2.3.3 Southern Region

The Southern Region consists of Segments 7, 8, and the southernmost portion of Segment 11 that is located south of the ANF boundary. Although the overwhelming majority of this region is dominated by urbanized development, such as the existing ROW; highly traveled roads; and residential, commercial, and industrial properties; many portions of the region contain large, continuous blocks of native vegetation. These areas support suitable habitat for a variety of special-status plant and wildlife species and in some cases serve as the last remaining islands of native habitat for neotropical birds as they pass through the region during the migratory season.

Segment 7 begins in the foothills of the San Gabriel Mountains just north of the City of Duarte. As this portion of the segment extends south, it traverses coastal sage scrub habitat down to the base of the foothills. From this point, the ROW continues south through residential neighborhoods and a nursery to the San Gabriel River corridor. As the ROW ties into the corridor, it parallels the San Gabriel River and the San Gabriel Freeway in a generally southwest direction. The San Gabriel River in this area could be categorized as a classic urban stream channel, lined with concrete throughout several sections and primarily surrounded by development on each side. However, in several areas large stands of native vegetation occur scattered throughout the channel and adjacent uplands.

As the ROW extends southwest, a patchwork of native vegetation communities, including riparian habitat such as mulefat and southern willow scrub, Riversidean alluvial fan sage scrub, and coastal sage scrub occur interspersed between large, continuous blocks of highly degraded, ruderal habitats and urbanized development. Within and adjacent to the San Gabriel River corridor, areas such as the Santa Fe Dam

Floodplain SEA, Whittier Narrows Dam Recreation Area, and Montebello Oil Fields support large patches of native coastal sage and Riversidean alluvial fan sage scrub communities as well as smaller ribbons of riparian scrub. Although highly degraded in some areas, these communities provide suitable habitat for a number of special-status species, including the federally endangered least Bell's vireo and the federally threatened coastal California gnatcatcher.

Segment 8 begins at the existing Mesa Substation and continues roughly east through the Los Angeles Basin until its termination at the existing Mira Loma Substation in San Bernardino County. As this segment extends east from the Mesa Substation and crosses into the City of Montebello, it traverses the Montebello Hills Oil Fields. This area is unique in that it supports occupied breeding habitat for the coastal California gnatcatcher within rolling hills dominated by coastal sage scrub. Beyond this point, the segment intersects the San Gabriel River near the Whittier Narrows Dam Recreation Area and begins to parallel an area that represents the western region of the Puente-Chino Hills Wildlife Corridor. The Puente-Chino Hills Wildlife Corridor is ecologically significant in that it represents some of the last remaining pockets of intact habitat amidst expansive urban sprawl in the Los Angeles Basin for a variety of both common and special-status plant and wildlife species. The wildlife corridor extends approximately 31 miles east and covers more than 30,000 acres through the Whittier Narrows Dam and Recreation Area, Puente Hills Landfill Native Habitat Preservation Authority, Puente Hills, Chino Hills, and the Cleveland National Forest. The overall importance of the Puente-Chino Hills Wildlife Corridor is reflected by the extensive amount of research that has been conducted throughout the area on wildlife movement and by the type and number of species that occur in the area (Robertson et al., 1995; Noss et al., 1996; Haas and Crooks, 1999; Haas, 2000; Hass and Turschak, 2002; Cooper, 2000; PCR et al., 2000; Lyren, 2001; Schlotterbeck, 2001; Haas et al., 2002; Case and Fisher, 1998; PCR, 2002). Segment 8 continues along the Puente and Chino Hills before traversing urbanized and agricultural areas in the eastern portion of the segment. Segment 8 terminates at the Mira Loma Substation, which is located in an agricultural area in the city of Ontario.

In the Southern Region, Segment 11 begins at the southern boundary of the ANF, passes through Eaton Canyon, and extends south to the existing Mesa Substation in the City of Monterey Park. As this segment travels south through an existing utility corridor, it traverses heavily developed areas comprised of major roadways and residential, commercial, and industrial properties. Several nurseries occur within the utility corridor. This segment continues south until its termination at the Mesa Substation. Just prior to this point, the segment lies just west of the Whittier Narrows Dam Recreation Area and just northwest of the Montebello Oil Fields.

Vegetation

The majority of the proposed Project in the Southern Region is Barren/Developed (Table 3.4-5). Undeveloped native vegetation is primarily located in the Whittier Narrows Recreation Area, San Gabriel River Channel, Montebello Hills, and Puente and Chino Hills. Within these areas, the most common vegetation type is Coastal Sage Scrub, followed by Ruderal Grassland, Coast Live Oak Woodland, and California Annual Grassland. Three vegetation types are dominated by nonnative plants: California Annual Grassland, Non-native Woodland, and Exotic (giant reed; *Arundo donax*). Extensive portions of both grassland habitat types (Ruderal Grassland and California Annual Grassland) are dominated by dense stands of non-native plant species. State-protected habitats that occur in the Southern Region include Southern Cottonwood Willow Riparian Forest, California Walnut Woodland, Southern Coast Live Oak Riparian Forest, and Southern Sycamore Alder Riparian Woodland. Numerous blue-line drainages appear

within the Southern Region, primarily along the San Gabriel River. USGS NWI maps depict numerous, small (0.3 to 1.0 acres) temporarily flooded wetlands and marshes, primarily near Chino. Several lakes and ponds occur within the northern portions of Segments 7 and 11 in the Southern Region.

Table 3.4-5. Vegetation Types Occurring in the Southern Region

Habitat Type	Acres	Percentage of Total Acreage
Barren/Developed	4763.76	53.68%
Coastal Sage Scrub	847.27	9.55%
Ruderal Grassland	766.82	8.64%
Coast Live Oak Woodland	491.32	5.54%
California Annual Grassland	445.29	5.02%
Agriculture	325.25	3.67%
California Walnut Woodland	261.01	2.94%
Nonnative Woodland	225.05	2.54%
Water	164.82	1.86%
Mixed Chaparral	146.93	1.66%
Mule Fat Scrub	70.26	0.79%
Southern Willow Scrub	67.89	0.77%
Ruderal Wetland	50.50	0.57%
Sparsely vegetated channel in non-desert	48.76	0.55%
Riversidean Alluvial Fan Sage Scrub	45.25	0.51%
Southern Arroyo Willow Riparian Forest	44.72	0.50%
Bunchgrass Grassland	36.81	0.41%
Southern Coast Live Oak Riparian Forest	26.80	0.30%
Southern Sycamore Alder Riparian Woodland	25.13	0.28%
Southern Cottonwood Willow Riparian Forest	12.05	0.14%
Exotic - Giant Reed	6.76	0.08%
Freshwater Marsh	1.20	0.01%
Scrub Oak Chaparral	0.04	0.00%
Total	8873.70	100.00%

Common Wildlife

As the majority of the Southern Region encompasses areas dominated by development, common wildlife species occurring throughout the area represent of broad spectrum of animals adapted to urban conditions. These include mammals such as opossum (*Didelphus virginiana*), striped skunk, raccoon (*Procyon lotor*), and coyote. Given the proximity to heavily developed areas, domestic cat (*Felis catus*) and dog (*Canis familiaris*) are expected to frequent a majority of the areas throughout the Southern Region. Many of the bird species occurring in the Southern Region, including mourning dove (*Zenaida macroura*), rock pigeon (*Columba livia*), American crow (*C. branchyrhyncos*), house sparrow (*Passer domesticus*), and European starling (*Sturnus vulgaris*) are commonly associated with urbanized areas. However, several areas throughout the Southern Region, particularly the Puente-Chino Hills Wildlife Corridor, support natural open space and suitable riparian habitat for a number of bird species, such as yellow-breasted chat (*Icteria virens*), yellow warbler (*Dendroica petechia*), red-winged blackbird (*Agelaius phoeniceus*), phainopepla (*Phainopepla nitens*), and hooded oriole (*Icterus cucullatus*). Reptile species that are likely to occur in the Southern Region include western fence lizard and side-blotched lizard.

Vegetation Types

Twenty-three vegetation types were mapped within the Southern Region of the proposed Project. Table 3.4-5 lists these habitat types including acres and percentage of total acreage within the proposed Project. Full descriptions of each of these habitats are provided in Appendix H of the *Biological Resources*

Specialist Report (Aspen and H.T. Harvey & Associates, 2009~~8~~) and vegetation maps are provided (Figure 3.4-4 located in the Map & Figure Series Volume).

Special-status Species

Special-Status Plant Species

Thirty-four special-status plant species have the potential to occur within the Southern Region of the proposed Project. Table 3.4-6 lists these species, their status, and their potential for occurrence. Figure 3.4-5, located in the Map & Figure Series Volume, shows the locations of special-status species. Detailed accounts for these species are provided in Appendix E of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~).

Special-Status Wildlife Species

Fifty special-status wildlife species have the potential to occur within the Southern Region of the proposed Project alignment. Table 3.4-7 lists these species, their status, and their potential for occurrence. Figure 3.4-5, located in the Map & Figure Series Volume, shows the locations of special-status species. Detailed accounts for these species are provided in Appendix J of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~).

Wildlife Movement

As described above, areas surrounding the Southern Region represent some of the most vital wildlife corridors and linkages in southern California, particularly the Puente-Chino Hills Wildlife Corridor. This corridor is a peninsula of mostly undeveloped hills that extend from the densely urbanized Los Angeles Basin southeast to the Santa Ana Mountains (CBI, 2005). Some of the key geographic units within the corridor include, but are not limited to, Whittier Narrows (an isolated patch at the northwest limits), Whittier Hills, Schabarum Park, Powder Canyon, Shell-Aera (privately owned), Carbon Canyon, Tonner Canyon, and Chino Hills. Much of the area, particularly through the Puente-Chino Hills, has remained immune from development due to geologic features such as steep slopes, earthquakes, and landslides. Tar pits and active and former oil wells have also limited development in the region (CBI, 2005).

Evidence of significant wildlife movement throughout the corridor has been heavily documented through numerous studies in the area (Robertson et al., 1995; Noss et al., 1997; Haas and Crooks, 1999; Haas, 2000; Hass and Turschak, 2002; Cooper, 2000; PCR et al., 2000; Lyren, 2001; Schlotterbeck, 2001; Haas et al., 2002; Case and Fisher, 1998; PCR, 2002). The corridor appears functional for at least larger mammals and birds, although movement is limited through some portions, including the Shell-Aera area, which is also known as the "missing middle" due to its private ownership amidst surrounding public lands (CBI, 2005). Wildlife movement is restricted in this area due to several barrier or near barrier roads, including State Route 57 and Harbor Boulevard (CBI, 2005). Due to strong edge effects associated with urban development, human presence, and domestic pet activity, corridor function is also tempered along portions of Tonner Canyon and Schabarum Park (CBI, 2005).

The movement patterns of large carnivores, such as mountain lion, coyote, and bobcat, have been intensely analyzed in this area. Mammalian carnivores are particularly vulnerable to extinction due to habitat fragmentation because they occur at low population densities and require expansive land areas for their home ranges (Shaffer, 1983; Beier, 1993; Noss et. al., 1996). The disappearance of top predators can result in a trickle-down effect that leads to an increase in smaller mesopredator populations, including

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Abram's alumroot *Heuchera abramsii*	CNPS 4.3, FSS	Dry, rocky areas in upper montane coniferous forest. Elev. 2800-3500 m. July-August	Segment 4: ~~Unlikely.~~Absent. Outside of the known range and elevation of the species. Segment 5: ~~Unlikely~~Absent. Outside of the known range and elevation of the species. Segment 6: ~~Possible. All occurrences for this species are on the ANF and occur in the Sheep Wilderness Area east of the Project area.~~ Absent. Outside of the known range and elevation of the species. ~~Segment 7: Unlikely~~Absent. Outside of the known range and elevation of the species. Segment ~~8: Unlikely~~7: Absent. Outside of the known range and elevation of the species. Segment ~~10: Unlikely~~8: Absent. Outside of the known range and elevation of the species. Segment 10: Absent. Outside of the known range and elevation of the species. Segment 11: ~~Possible. All occurrences for this species are on the ANF and occur in the Sheep Wilderness Area east of the Project area.~~Absent. Outside of the known range and elevation of the species.
Alkali mariposa lily *Calochortus striatus*	CNPS 1B.2, FSS	Alkaline soils, in floodplains and springs in chaparral, chenopod scrub, and Mojavean desert scrub. Elev. 230-5,232 ft. April-June.	Segment 4: Unlikely. Suitable habitat may exist in alkaline soils within Mojave Creosote Bush Scrub or Desert Saltbush Scrub, but no such areas were observed within the alignment during focused 2008 surveys of each impact location. Segment 5: Unlikely. Suitable habitat may exist in alkaline soils within Mixed Chaparral and Big Sage Brush Scrub, but no such areas were observed within the alignment during focused 2008 surveys of each impact location. Segment 6: Unlikely. Suitable habitat may exist in alkaline soils in the Northern Region within Big Sagebrush Scrub surrounding the Vincent Substation, but no such areas were observed within the alignment during focused 2008 surveys of each impact location. One record of this species exits within the San Gabriel Mountains in the Central Region and could represent a misidentification. No suitable habitat was observed to exist within the Central Region during either 2007 or 2008 focused surveys. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Suitable habitat may exist in alkaline soils within Mojave Creosote Bush Scrub or Desert Saltbush Scrub, but no such areas were observed within the alignment during focused 2008 surveys of each impact location. Segment 11: Unlikely. Suitable habitat may exist in alkaline soils within Mixed Chaparral, Big Sage Brush Scrub, and Mojave Creosote Bush Scrub, but no such areas were observed within the alignment during focused 2008 surveys of each impact location. One record of this species exits within the San Gabriel Mountains in the Central Region and could represent a misidentification. No suitable habitat was observed to exist within the Central Region during either 2007 or 2008 focused surveys.
Baja navarretia *Navarretia peninsularis*	CNPS 1B.2, FSS	Mesic sites within chaparral and lower montane coniferous forest communities. Elev. 4,900-7,600 ft. June-August.	Segment 4: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 5: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat present. Segment 6: Unlikely. Although suitable habitat is present, the only known occurrence of this species within Los Angeles County is in the vicinity of Frazier Mtn. Segment 7: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat present. Segment 8: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat present. Segment 10: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat present. Segment 11: Unlikely. Although suitable habitat is present, the only known occurrence of this species within Los Angeles County is in the vicinity of Frazier Mtn.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Brand's phacelia *Phacelia stellaris*	CNPS 1B.1, FC	Sandy substrates within coastal dune and coast scrub communities. Elev. below 1,113 ft. March-June.	Segment 4: **Unlikely**. Outside of the known range of the species and no suitable habitat exists. Segment 5: **Unlikely**. Outside of the known range of the species and no suitable habitat exists. Segment 6: **Unlikely**. Outside of the known range of the species and no suitable habitat exists. Segment 7: **Possible**. There is a historical population of this species that has been extirpated by development within the proposed Project in the San Gabriel River east of El Monte. Segment 8: **Possible**. Although there are no historical records of this species within the immediate vicinity of this segment, sandy substrates in the Puente/Chino Hills may offer suitable habitat. Segment 10: **Unlikely**. Outside of the known range of the species and no suitable habitat exists. Segment 11: **Unlikely**. Only marginal habitat is present for this species within this Segment and is either highly developed or disturbed. This species is not known to occur in the foothills of the San Gabriel Mountains.
Braunton's milk-vetch *Astragalus brauntonii*	CNPS 1B.1, FE	Chaparral, coastal scrub, closed-cone coniferous forests, and scrubby valley and foothill grasslands in recently burned or disturbed areas. Elev. below 2,100 ft. February-June.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Possible** in the Central Region. There is an extant population of this species between Segments 7 and 11 just south of the ANF boundary. Segment 7: **Possible**. There is an extant population of this species between Segments 7 and 11 just south of the ANF boundary. Segment 8: **Possible**. Although there are no historical records of this species within the immediate vicinity of this segment, ~~anya~~ recorded population occurs in Coal Canyon of Chino Hills State Park. Any disturbed or recently burned ~~sites~~site with suitable microhabitat conditions in the Puente/Chino Hills may offer ~~suitable~~ habitat. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible**. There is an extant population of this species between Segments 7 and 11 just south of the ANF boundary.
California androsace *Androsace elongata* ssp. *acuta*	CNPS 4.2, FSW	Coastal scrub, chaparral, cismontane woodland, meadows and seeps, and valley and foothill grassland habitats. Elev. 492-3,936 ft. March-June.	Segment 4: **Possible**. Suitable habitat exits in the northern portions within California Annual Grassland. Segment 5: **Present**. This subspecies was identified within 200 feet of tower location 31 along this alignment. Several populations occur on the border of the Antelope Valley and the San Gabriel Mountains. Segment 6: **Possible**. Several populations occur on the border of the Antelope Valley and the San Gabriel Mountains, and on the foothill desert slopes of the San Gabriel, Liebre, and San Bernardino Mountains. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. ~~Outside of the known range of the species~~Limited suitable habitat is present. Segment 10: **Unlikely**. Desert Bunchgrass Grassland may provide marginal habitat. Segment 11: **Possible**. Several populations occur on the border of the Antelope Valley and the San Gabriel Mountains and on the foothill desert slopes of the San Gabriel, Liebre, and San Bernardino Mountains.
California satintail *Imperata brevifolia*	CNPS 2.1, FSS	Meadows and seeps within chaparral, coastal scrub, and Mojavean desert scrub communities. Elev. below 1,700 ft. September-May.	Segment 4: **Unlikely**. Although suitable habitat may be present, there are no records of the species occurring within the region. Segment 5: **Unlikely**. Although suitable habitat may be present, there are no records of the species occurring within the region. Segment 6: **Possible** in the Central Region. Reported populations occur in the San Dimas Experimental Forest, between Fish and Roberts Canyon and along Big Tujunga Canyon Rd. Unlikely in the Northern Region. Although suitable habitat may be present, there are no records of the species occurring within the region. Segment 7: **Possible**. There is suitable habitat for this species in the foothills of the San Gabriel Mountains north of Duarte. Recorded populations of this species occur in the San Dimas Experimental Forest and between Fish and Roberts Canyons.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			Segment 8: Possible. Although there are no historical records for this species in the Puente/Chino Hills, suitable habitat may be present. Segment 10: Unlikely. Although suitable habitat may be present, there are no records of the species occurring within the region. Segment 11: Possible in the Central and Southern Regions. Reported populations occur in the San Dimas Experimental Forest, between Fish and Roberts Canyon and along Big Tujunga Canyon Rd. There is suitable habitat for this species in the foothills of the San Gabriel Mountains north of Altadena and La Cañada Flintridge. Unlikely in the Northern Region. Although suitable habitat may be present, there are no records of the species occurring within the region.
California walnut *Juglans californica*	CNPS 4.2, FSW	Alluvial soils within chaparral, cismontane woodland, and coastal scrub communities. Elev. 150-3,000 ft. March-August.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Present in the Central Region. The species was observed within the proposed Project immediately adjacent to access road 3N23. Segment 7: Possible. There is suitable habitat for this species in the foothills of the San Gabriel Mountains north of Duarte. The species was observed on Segment 11 in the foothills of the San Gabriel mountains within the ANF. Segment 8: Present. This species was observed on Segment 8 in the Puente/Chino Hills. Over 260 acres of California Walnut Woodland was mapped in this area. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Present in the Central Region. The species was observed within the proposed Project off of Dark Canyon Rd in the southern foothills of the San Gabriel Mountains. Possible in the Southern Region. The species was observed on Segment 11 in the foothills of the San Gabriel mountains within the ANF.
Catalina mariposa lily *Calochortus catalinae*	CNPS 4.2	Chaparral , cismontane woodland, coastal scrub, and valley and foothill grassland habitat. Elev. 49-2,297. (February) March-June.	Segment 4: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 5: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 6: Unlikely. Outside of the known range of the species, only marginally suitable habitat is present.~~.~~ Segment 7: Unlikely. Only marginally suitable habitat is present within the southern portions of Segment 7, and these areas are highly disturbed. Segment 8: ~~Likely.~~Present. Observed ~~nearby~~near the proposed Project in the Puente Hills Landfill Native Habitat Preservation Authority lands. Suitable habitat occurs and CNDDB records for the species occur within CHSP. The Consortia of Herbaria lists 275 records of this species within Southern California. Segment 10: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 11: Unlikely. Only marginally suitable habitat is present within these portions of Segment 11, and these areas are highly disturbed.
Chaparral sand-verbena *Abronia villosa* var. *aurita*	CNPS 1B.1	Chaparral, coastal scrub and desert dune habitat in loose, sandy soils. Elev. 262-5,249 ft. January-September.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Unlikely. Outside of the known range of the species. Segment 7: Unlikely. There are no records of this variety within 5 miles of the proposed Project. Additionally, habitat conditions within the proposed Project are marginal for this plant and highly impacted. Segment 8: Possible. Two records of this variety occur south of Segment 8 in the vicinity of Highway 91. Suitable habitat exists within the Puente/Chino Hills. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Unlikely. There are no records of this variety within 5 miles of the proposed Project. Additionally, habitat

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			conditions within the proposed Project are marginal and highly impacted.
Chickweed oxytheca *Oxytheca caryophylloides* (= *Sidotheca caryophylloides*)	CNPS 4.3, FSS	Sandy soils within lower montane coniferous forest communities. Elev. 3,654-8,530 ft. July-September.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Possible in the Central Region. There are 2 records of this species in the vicinity of the proposed Project on Waterman Mountain and Kratka Ridge. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Possible in the Central Region. There are 2 records of this species in the vicinity of the proposed Project on Waterman Mountain and Kratka Ridge.
Coulter's matilija poppy *Romneya coulteri*	CNPS 4.2	Chaparral and coastal scrub, often in burns. Elev. 65-3,934 ft. March-July.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Possible. ~~Suitable~~Potential habitat is present and it is known to occur in southern California (the Consortia of Herbaria lists 148 records of this species~~ within Southern California.~~). Segment 7: Unlikely. Known historically from the Chino Hills, but currently considered to be absent from the area. Not observed during protocol-level surveys. Segment 8: Likely: Observed nearby in the Puente Hills Landfill Native Habitat Preservation Authority lands, however not known if this is a native occurrence. ~~Known historically from the~~Several records occur within Chino Hills~~, but currently considered to be absent from the area~~ State Park at Coal Canyon and Lower Aliso Canyon. Not observed during ~~protocol-level~~focused surveys. Present in Chino Hills State Park. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: ~~Possible~~Present in the Central Region. This species was observed during spring 2008 surveys in the vicinity of the southern portion of Segment 11, approx. 2/3 of a mile outside of the ANF.
Coulter's saltbush *Atriplex coulteri*	CNPS 1B.2	Coastal scrub, and valley and foothill grasslands underlain with clay and alkaline soils. Elev. below 1,509 ft. March-October.	Segment 4: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 5: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 6: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 7: Unlikely. There are no records of this species within 10 miles of this segment, marginally suitable habitat is present. Segment 8: Possible. A historical population occurs within the proposed Project in the vicinity of Chino Creek. Segment 10: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 11: Unlikely. There are no records of the species within 10 miles of this Segment, marginally suitable habitat is present.
Davidson's bush mallow *Malacothamnus davidsonii*	CNPS 1B.2	Sandy washes and flats within Coastal Scrub and chaparral communities. Elev. 600-2,800 ft. June-January.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Possible in the central Region. The Consortium of California Herbaria lists 17 records of this species within the San Gabriel Mountains. The potential for occurrence is restricted to suitable habitats south of the Mill Creek Summit Divide. Segment 7: Possible. Suitable habitat for this species occurs in the foothills of the San Gabriel Mountains north of Duarte. Segment 8: Possible. Suitable habitat for this species occurs in the Puente/Chino Hills and surrounding areas. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Possible in the Central and Southern Regions. The Consortium of California Herbaria lists 17 records of this

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			species within the San Gabriel Mountains. The potential for occurrence is restricted to suitable habitats south of the Mill Creek Summit Divide. Suitable habitat for this species occurs in the foothills of the San Gabriel Mountains north of Altadena and La Cañada Flintridge and along the San Gabriel River.
Davidson's saltscale *Atriplex serenana* var. *davidsonii*	CNPS 1B.2	Coastal scrub and coastal bluff scrub habitats underlain by alkaline soils. Elev. below 656 ft. March-October.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. Outside of the known range of the species. Segment 7: **Possible**. Suitable habitat for this variety may exist within the proposed Project in the San Gabriel River. Segment 8: **Possible**. This variety could occur within the Puente/Chino Hills and surrounding areas. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. The areas of this segment that are within the species elevation range are located in highly developed metropolitan areas.
Engelmann oak *Quercus engelmannii*	CNPS 4.2	Canopy species in grassland/oak savanna or chaparral and within riparian corridors along raised stream terraces. Elev. 160-4500 ft. March-June.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Likely** in the Central Region. Suitable habitat occurs within riparian corridors throughout the ANF. Segment 7: **Unlikely**. Not known from the Chino/Puente Hills; considered to be absent. Not observed during protocol-level surveys Segment 8: **Unlikely**. Not known from the Chino/Puente Hills; considered to be absent. Not observed during protocol-level surveys Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Present** in the Central Region. This species was detected within 200 feet of tower locations 92 and 93 of this alignment, outside of the ANF. There are also a few known sites around the San Gabriel Mountain foothill cities. Suitable habitat occurs within riparian corridors throughout the ANF.
Ewan's cinquefoil *Potentilla glandulosa* ssp. *ewanii*	CNPS 1B.3, FSS	Lower montane coniferous forest near seeps and springs. Elev. 6,230-7,875 ft. June-July.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. Known only from four occurrences near the Dawson 'Saddle area. Outside of known elevational range for this species. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. Known only from four occurrences near the Dawson 'Saddle area. Outside of known elevational range for this species.
Fragrant pitcher sage *Lepechinia fragrans*	CNPS 4.2, FSS	Chaparral; generally associated with California sagebrush (*Artemisia californica*), buckwheat (*Eriogonum sp.*), and white sage (*Salvia*	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Likely**. The species is expected to occur on north-facing slopes in the southern foothills of the San Gabriel Mountains. Segment 7: **Possible**. Suitable habitat is present on the north facing slopes in the foothills of the San Gabriel Mountains. The Consortium of California Herbaria lists 31 records of this species in the San Gabriel Mountains. Segment 8: **Unlikely**. This segment lies outside the known range of this species. Segment 10: **Unlikely**. Outside of the known range of the species.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
		apiana). Elev. below 4,298 ft. March-October.	Segment 11: **Present** in the Central and Southern Regions. Several populations of this species were observed within the proposed Project, including on and adjacent to Grizzly Flat Road and CCC Ridge Road during 2008 surveys. Also observed within the proposed Project off of Dark Canyon Rd. This species is locally abundant on north facing slopes in the foothills of the San Gabriel Mountains.
Gairdner's yampah *Perideridia gairdneri* ssp. *gairdneri*	CNPS 4.2, FSW	Chaparral, coastal prairie, and valley and foothill grassland communities. Elev. below 1,197 feet. June-October.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. Although suitable habitat is present, there are no records of this subspecies near this segment. Segment 7: **Unlikely**. Although suitable habitat is present, there are no records of this subspecies within this region. Segment 8: **Unlikely**. Although suitable habitat is present, there are no records of this subspecies within this region. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. Although suitable habitat is present, there are no records of this subspecies near the Project alignment.
Golden violet *Viola aurea*	CNPS 2.2	Great Basin scrub and pinyon and juniper woodland habitats in sandy soils. Elev. 3,280-5,900 ft. April-May.	Segment 4: **Unlikely**. There are no recorded populations of this species within the Antelope Valley. Segment 5: **Possible**. There are recorded populations of this species in the vicinity of Big Rock Creek and Big Pines. Segment 6: **Possible** in the Northern and Central Regions. There are recorded populations of this species in the vicinity of Big Rock Creek and Big Pines. There are also population records in the vicinity of Big Rock Creek and Big Pines. The potential for occurrence is restricted to suitable habitats north of the Mill Creek Summit Divide. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. There are no recorded populations of this species within the Antelope Valley. Segment 11: **Possible** in the Northern and Central Regions. There are recorded populations of this species in the vicinity of Big Rock Creek and Big Pines. There are also population records in the vicinity of Big Rock Creek and Big Pines. The potential for occurrence is restricted to suitable habitats north of the Mill Creek Summit Divide.
Greata's aster *Aster greatae* = (*Symphyotrichum greatae*)	CNPS 1B.3	Chaparral, broadleaved upland forests, lower montane coniferous forests, riparian woodlands, and southern oak woodlands, particularly in canyons. Elev. 984-6,594 ft. June-October	Segment 4: **Unlikely**. This segment lies outside the known range of this species, which is endemic to the San Gabriel Mountains. Segment 5: **Possible**. Recorded occurrence near Acton. Northern portions of the segment in the Antelope Valley are outside the known range of the species. Segment 6: **Present** in the Central Region. Several records of this species occur within the proposed Project. In addition, the species was observed immediately adjacent to this segment during surveys of the alignment. Possible in the Northern Region. There is a recorded occurrence near Acton, just west of the Vincent Substation. Segment 7: **Possible**. This species is endemic to the San Gabriel Mountains. Therefore, potential occurrence for this species is limited to the foothills of the San Gabriel Mountains. Segment 8: **Unlikely**. This segment is outside of the known range of the species. The species is endemic to the San Gabriel Mountains. Segment 10: **Unlikely**. This segment lies outside the known range of this species, which is endemic to the San Gabriel Mountains. Segment 11: **Present** in the Central Region. Several records of this species occur within the proposed Project. In addition, the species was observed immediately adjacent to this segment during surveys of the alignment. Possible in the Northern Region. There is a recorded occurrence near Acton, just west of the Vincent Substation. Unlikely in the Southern Region - outside of the known range for this species.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Hall's monardella *Monardella macrantha* ssp. *hallii*	CNPS 1B.3, FSS	Dry slopes and ridges within chaparral, Cismontane Woodland, Lower Montane Coniferous Forest, and Valley and Foothill Grassland communities. Elev. 2,400-7,200 ft. June-August.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Unlikely. Although suitable habitat is present in the Central Region, the only known occurrence of this subspecies within the San Gabriel Mountains is over 10 miles east of the proposed Project in the vicinity of Sunset Peak. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Unlikely. Although suitable habitat is present in the Central Region, the only known occurrence of this subspecies within the San Gabriel Mountains is over 10 miles east of the proposed Project in the vicinity of Sunset Peak.
Intermediate mariposa lily *Calochortus weedii* var. *intermedius*	CNPS 1B.2	Rocky soils within chaparral, coastal scrub, and valley and foothill grassland habitats. Elev. 344-2,805 ft. May-July.	Segment 4: ~~Unlikely~~Absent, no suitable habitat present. Segment 5: ~~Unlikely~~Absent, no suitable habitat present. Segment 6: ~~Unlikely~~Absent, no suitable habitat present. Segment 7: Unlikely. Only marginal habitat for this variety is present and is either highly developed or disturbed. This subspecies is not known from foothills of the San Gabriel Mountains. Segment 8: Present. This variety was detected within 200 feet of tower locations 25, 27, and 64 along this alignment. Additionally, a recorded population occurs immediately south of Segment 8 in the vicinity of Sonome Canyon in the Chino Hills. This species is also present in Chino Hills State Park and was identified during surveys for the Alternative 4 re-routes. Segment 10: ~~Unlikely~~Absent, no suitable habitat present. Segment 11: Unlikely. Only marginal habitat for this variety is present and is either highly developed or disturbed. This plant is not known from foothills of the San Gabriel Mountains.
Johnston's buckwheat *Eriogonum microthecum* var. *johnstonii*	CNPS 1B.3, FSS	Subalpine and upper montane coniferous forests. Elev. 6,000-9,600 ft. July-September.	Segment 4: ~~Unlikely~~Absent, no suitable habitat present. Segment 5: ~~Unlikely~~Absent, no suitable habitat present. Segment 6: Unlikely. Outside of known distribution range for this species, marginal habitat exists. Segment 7: ~~Unlikely~~Absent, no suitable habitat present. Segment 8: ~~Unlikely~~Absent, no suitable habitat present. Segment 10: ~~Unlikely~~Absent, no suitable habitat present. Segment 11: Unlikely. Outside of known distribution range for this species, marginal habitat exists.
Kuche's sandwort *Arenaria macradenia* var. *kuschei*	CNPS 1B.1, FSS	Rocky chaparral habitats. Elev. 4,000-5,580 ft. June-July.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Unlikely. Outside of known distribution range for this species although suitable habitat exists in the Central Region. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Unlikely. Outside of known distribution range for this species although suitable habitat exists in the Central Region.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Laguna Mountains jewel-flower *Streptanthus bernardinus*	CNPS 4.3, FSS	Chaparral and lower montane coniferous forest. Elev. 2,200-8,200 ft. May-August.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Unlikely. Although suitable habitat is present, there are no records of this species in Los Angeles County. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Unlikely. Although suitable habitat is present, there are no records of this species in Los Angeles County.
Late-flowered mariposa lily *Calochortus weedii* var. *vestus*	CNPS 1B.2, FSS	Chaparral, cismontane woodland, and riparian woodland (often serpentinite). Elev. 900-6,250 ft. June-August.	Segment 4: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 5: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 6: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 7: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 8: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 10: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present. Segment 11: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat present.
Lemmon's syntrichopappus *Syntrichopappus lemmonii*	CNPS 4.3, FSW	Chaparral, Joshua tree woodland, and pinyon and juniper woodlands within sandy or gravelly soils. Elev. 1,640-6,004 ft. April-May.	Segment 4: Possible. ~~. There are several occurrences of this species~~ Habitat present. Known to occur in the Antelope Valley and surrounding mountains. Segment 5: Possible. ~~There are several occurrences of this species~~Habitat present. Known to occur in the Antelope Valley and surrounding mountains. Segment 6: Possible in the Northern and Central Regions. ~~There are several occurrences of this species~~Habitat present. Known to occur in the Antelope Valley and surrounding mountains. The Consortium of California Herbaria lists 23 records of this species in the San Gabriel Mountains. Segment 7: Unlikely. All reported populations of this species are from the Transverse Range, Peninsular Range, and Mojave Desert regions. There are no reports of the species occurring in the southern foothills of the San Gabriel Mountains. Segment 8: Unlikely. All reported populations of the species are from the Transverse Range, Peninsular Range, and Mojave Desert region. Segment 10: Possible. ~~There are several occurrences of this species~~Habitat present. Known to occur in the Antelope Valley and surrounding mountains. Segment 11: Present in the Central Region. The species was observed within the proposed Project along a potential spur road branching off of 4N24. Possible in the Northern Region. ~~There are several occurrences of this species~~Habitat present. Known to occur in the Antelope Valley and surrounding mountains. Unlikely in the Southern Region. All reported populations of the species are from the Transverse Range, Peninsular Range, and Mojave Desert region. There are no reports of the species occurring in the southern foothills of the San Gabriel Mountains.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Lemon lily *Lilium parryi*	CNPS 1B.2, FSS	Meadows and seeps within lower and upper montane coniferous forests communities. Elev. 4,000-9,000 ft. July-August.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Possible in the Central Region. A population of this species is reported to occur east of Segment 6 in the vicinity of Pacifico Mtn. This occurrence is within 5 miles of the proposed Project. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Possible in the Central Region. The Consortium of California Herbarium lists 23 occurrences of this species within the San Gabriel Mountains.
Long-spined spineflower *Chorizanthe polygonoides* var. *longispina*	CNPS 1B.2	Chaparral, coastal scrub, meadows and seeps, and valley and foothill grassland habitats in clay soils. Elev. 98-5,020 ft. April-July.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Unlikely. Outside of the known range of the species. Segment 7: Unlikely. This segment lies outside the known range of this variety. Segment 8: Unlikely. This segment may lie outside the known range of this variety. The northernmost population of the species is over 10 miles to the south. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Unlikely. This segment lies outside the known range of this variety.
Los Angeles sunflower *Helianthus nuttallii ssp. parishii*	CNPS 1A	Salt or freshwater marshes. Elev. below 5,500 ft. August-October.	Segment 4: Unlikely. Outside of the known range of the species. Presumed extinct, and has not been seen since 1937. Segment 5: Unlikely. Outside of the known range of the species. Presumed extinct, and has not been seen since 1937. Segment 6: Unlikely. This subspecies is presumed extinct and no historical records occur within this portion of the San Gabriel Mountains. Segment 7: Unlikely. The Whittier Narrows area may offer marginal habitat; however, this subspecies is presumed extinct, and has not been seen since 1937. Segment 8: Unlikely. The Whittier Narrows area may offer marginal habitat; however, this subspecies is presumed extinct and has not been seen since 1937. Segment 10: Unlikely. Outside of the known range of the species. Presumed extinct, and has not been seen since 1937. Segment 11: Unlikely. This subspecies is presumed extinct and no historical records occur within this portion of the San Gabriel Mountains. This Northern and Southern Regions lack suitable habitat. In addition, this subspecies is presumed extinct, and has not been seen since 1937.
Many-stemmed dudleya *Dudleya multicaulis*	CNPS 1B.2, FSS	Generally clay soils within chaparral, coastal scrub, and valley and foothill grassland. Elev. 230-2,600 ft. April-July.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Possible in the Central Region. This species is generally restricted to the Los Angeles Basin; however there are several populations in the southern foothills of the San Gabriel Mountains. Segment 7: ~~Possible.~~ Present: Documented in a checklist of plants in Whittier Hills (Schneider Ljubenkov and Ross, 2002). Suitable habitat exists in the foothills just south of the ANF. Segment 8: ~~Likely:~~Present: Documented in a checklist of plants in Whittier Hills (Schneider Ljubenkov and Ross, 2002). Observed nearby in the Puente Hills Landfill Native Habitat Preservation Authority lands. ~~A recorded population occurs in the vicinity of the Puente/~~Records occur from Chino Hills State Park in Lower Aliso Canyon along the West Ridge Road. Segment 10: Unlikely. Outside of the known range of the species.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			Segment 11: **Possible** in the Central and Southern Regions. This species is generally restricted to the Los Angeles Basin; however there are several populations in the southern foothills of the San Gabriel Mountains. Suitable habitat exists in the foothills just south of the ANF.
Mason's neststraw *Stylocline masonii*	CNPS 1B.1	Chenopod scrub and pinyon and juniper woodland habitats within sandy soils. Elev. 328-3,936 ft. March-May	Segment 4: **Unlikely**. This segment lies outside the known range of the species. Segment 5: **Possible**. There is a known occurrence within 5 miles of proposed Project alignment in Soledad Canyon Wash east of Acton. This wash intersects Segment 5 at the Vincent Substation. Segment 6: **Possible** in the Northern and Central Regions. There is a known occurrence within 5 miles of proposed Project alignment in Soledad Canyon Wash east of Acton. This wash intersects Segment 5 at the Vincent Substation. A population record for this species occurs west of the Vincent Substation outside of Acton. The potential for occurrence is restricted to suitable habitats north of the Mill Creek Summit Divide. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. This segment lies outside the known range of the species. Segment 11: **Possible** in the Northern and Central Regions. There is a known occurrence within 5 miles of proposed Project alignment in Soledad Canyon Wash east of Acton. This wash intersects Segment 5 at the Vincent Substation. A population record for this species occurs west of the Vincent Substation outside of Acton. The potential for occurrence is restricted to suitable habitats north of the Mill Creek Summit Divide.
Mesa horkelia *Horkelia cuneata* ssp. *puberula*	CNPS 1B.1, FSS	Sandy or gravelly habitats within chaparral, cismontane woodland, and coastal scrub communities. Elev. 200-2,700 ft. February-July.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Possible** in the Central Region. Suitable habitat is present, but the potential for occurrence is restricted to the southern foothills of the San Gabriel Mountains. Segment 7: **Possible**. There are several historical records of this subspecies within 5 miles of the proposed Project. Segment 7 crosses one of these historical occurrences in the San Gabriel River channel north of Mayflower Village. Segment 8: **Possible**. Although there are no historical records for this subspecies in the Puente/Chino Hills, suitable habitat may be present. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible** in the Central and Southern Regions. There are 2 recorded populations of this subspecies adjacent to the proposed Project in the foothills surrounding Altadena.
Mojave Indian paintbrush *Castilleja plagiotoma*	CNPS 4.3, FSS	Great Basin scrub, Joshua tree woodland, lower montane coniferous forest, and pinyon and juniper woodland habitats. Elev. 984-8,200 ft. April-June.	Segment 4: **Possible**. Suitable habitat for this species is present, and there are numerous collections from the Antelope Valley. Segment 5: **Possible**. Suitable habitat for this species is present, and there are numerous collections from the Antelope Valley. Segment 6: ~~Possible~~Present. Several populations found along access road at northern end of segment. Consortium of California Herbaria list several records of this species within the desert foothills of the San Gabriel Mountains. There is a historical occurrence on Mint Canyon Road near Vincent. The range of this species does not extend south of the Mill Creek Summit Divide. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Possible**. Suitable habitat for this species is present, and there are numerous collections from the Antelope Valley. Segment 11: **Possible**. The Consortium of California Herbaria list several records of this species within the desert foothills of the San Gabriel Mountains. There is a historical occurrence on Mint Canyon Road near Vincent. The range of this species does not

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			extend south of the Mill Creek Summit Divide.
Mojave tarplant *Deinandra mohavensis*	CNPS 1B.3, SE, FSS	Chaparral, coastal sage scrub, and mesic riparian scrub. Elev. 2,100-5,250 ft. July-October.	Segment 4: ~~Unlikely~~Absent. Outside of the known range of the species. Segment 5: Absent~~Unlikely~~. Outside of the known range of the species. Segment 6: Unlikely. Project is outside of known distribution range, but marginal habitat exists. Segment 7: Absent~~Unlikely~~. Outside of the known range of the species. Segment 8: Absent~~Unlikely~~. Outside of the known range of the species. Segment 10: Absent~~Unlikely~~. Outside of the known range of the species.. Segment 11: Unlikely. Project is outside of known distribution range, but marginal habitat exists.
Mt. Gleason Indian paintbrush *Castilleja gleasonii*	CNPS 1B.2, SR, FSS	Rocky places within lower montane coniferous forest and pinyon and juniper woodland communities. Elev. 2,700-7,120. May-June.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: ~~Possible~~ Present in the Central Region. Population found on Alternative 6 helicopter site 4.~~There are several recorded populations of this species within 5 miles of the proposed Project in the vicinity of Lightning Point Group Camp.~~ Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Possible in the Central Region. There is a recorded population of this species within 5 miles of the proposed Project in the vicinity of Horse Flat Campground.
Nevin's barberry *Berberis nevinii*	CNPS 1B.1, SE, FE	Chaparral, cismontane woodland, coastal scrub, and riparian scrub on gravelly wash margins along alluvial scrub; it prefers coarse soils. Elev. 900- 2,000 ft. March-April.	Segment 4: Unlikely. Outside of the known range of the species, but marginal habitat exists. Segment 5: Unlikely. Outside of the known range of the species, but marginal habitat exists. Segment 6: Possible in the Central Region. The CNDDB lists 2 extant occurrences of this species within the ANF: Lopez Canyon and San Francisquito Canyon. The range of this species does not extend north of the Mill Creek Summit Divide. Segment 7: Possible. ~~There is a~~A population occurs outside of the project area in the Claremont Wilderness Park north of Claremont (10 miles outside the Project area). Segment 8: Possible. Although there are no historical records of this species within the immediate vicinity of this segment, suitable habitat exists within the Puente/Chino Hills. Segment 10: Unlikely. Outside of the known range of the species, but marginal habitat exists. Segment 11: Possible in the Central and Southern Regions. The CNDDB lists 2 extant occurrences of this species within the ANF: Lopez Canyon and San Francisquito Canyon. The range of this species does not extend north of the Mill Creek Summit Divide. In the Southern Region, an historical occurrence of this species occurs within 5 miles of the proposed Project within the Arroyo Seco Wash, south of the Devil's Gate Reservoir.
Ocellated Humboldt lily *Lilium humboldtii* ssp. *ocellatum*	CNPS 4.2, FSW	Riparian woodland openings within chaparral, cismontane woodland, coastal scrub, and lower montane coniferous forest communities; generally on gravelly	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Present in the Central Region. The species was observed within the proposed Project immediately adjacent to access road 2N23. Another location was found under the powerline corridor in the vicinity of Big Tujunga Creek just west of Shortcut Station. Segment 7: Possible. The Consortium of California Herbaria lists several occurrences of this subspecies in the southern foothills of the San Gabriel Mountains. Segment 8: Possible. Although there are no historical records for this subspecies in the Puente/Chino Hills, suitable habitat is present.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
		soils within gullies. Elev. below 6,000 ft. March-July.	Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Present** in the Southern Region. This subspecies was observed within the proposed Project in an intermittent creek channel just to the west of the Angeles Crest fire station. Likely in the Central Region. This subspecies was observed less than 400 ft outside of the ANF boundary within the proposed Project in an intermittent creek channel just to the west of the Angeles Crest fire station. Suitable riparian habitat occurs throughout the alignment on the ANF.
Orcutt's linanthus *Linanthus orcuttii*	CNPS 1B.3	Chaparral, lower montane coniferous forest, and pinyon and juniper woodland communities. Elev. 3,002-7,038 ft. May-June.	Segment 4: **Unlikely**. This segment lies outside the known range of this species. Segment 5: **Unlikely**. There are no reported occurrences on the northern desert slopes of the San Gabriel Mountains. Segment 6: **Unlikely**. Although suitable habitat is present, the species is known from only a single historical occurrence in Los Angeles County, which is presumed to be extirpated. There are no reported occurrences on the northern desert slopes of the San Gabriel Mountains. Segment 7: **Unlikely**. Although suitable habitat is present, the species is known from only a single historical occurrence in Los Angeles County, which is presumed to be extirpated. Segment 8: **Unlikely**. Although suitable habitat is present, the species is known from only a single historical occurrence in Los Angeles County, which is presumed to be extirpated. Segment 10: **Unlikely**. This segment lies outside the known range of this species. Segment 11: **Unlikely**. Although suitable habitat is present, the species is known from only a single historical occurrence in Los Angeles County, which is presumed to be extirpated. There are no reported occurrences on the northern desert slopes of the San Gabriel Mountains.
Pale-yellow layia *Layia heterotricha*	CNPS 1B.1	Cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland habitats on alkaline and clay soils. Elev. 984-5,594 ft. March-June.	Segment 4: **Unlikely**. This species is known from a single historical occurrence in the Antelope Valley. Segment 5: **Unlikely**. This species is known from a single historical occurrence in the Antelope Valley. Segment 6: **Unlikely**. This species is known from a single historical occurrence in the Antelope Valley. Segment 7: **Unlikely**. This species is known from a single historical occurrence in the Antelope Valley. Segment 8: **Unlikely**. This species is known from a single historical occurrence in the Antelope Valley. Segment 10: **Unlikely**. This species is known from a single historical occurrence in the Antelope Valley. Segment 11: **Unlikely**. This species is known from a single historical occurrence in the Antelope Valley.
Palmer's mariposa lily *Calochortus palmeri* var. *palmer*i	CNPS 1B.2, FSS	Wet meadows and seeps in lower montane coniferous forest and chaparral habitats. Elev. 3,281-7,841 ft. May-July.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Possible** in the Central Region. A population record for this variety occurs within 5 miles of the proposed Project in the vicinity of Devil's Canyon. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible** in the Central Region. Suitable habitat for this variety is present, and a population is documented within 10 miles of the proposed Project.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Parish's checkerbloom *Sidalcea hickmanii* ssp. *parishii*	CNPS 1B	Chaparral and montane conifer habitat between 4,000 and 7,500 feet. It is disturbance oriented and is found after fire and on grazed land. June-August.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. Although suitable habitat is present in the Central Region, there are no records of this subspecies in the San Gabriel Mountains. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. Although suitable habitat is present in the Central Region, there are no records of this subspecies in the San Gabriel Mountains.
Parish's gooseberry *Ribes divaricatum* var. *parishii*	CNPS 1A	Riparian woodland habitats. Elev. 200-1,000 ft. February-March.	Segment 4: **Unlikely**. Outside of the known range of the species. Variety is presumed extinct and has not been seen since 1980. Segment 5: **Unlikely**. Outside of the known range of the species. Variety is presumed extinct and has not been seen since 1980. Segment 6: **Unlikely**. Outside of the known range of the species. Variety is presumed extinct and has not been seen since 1980. Segment 7: **Unlikely**. A historical CNDDB record of this variety occurs within the proposed Project in the Whittier Narrows area. However, this variety is presumed extinct and has not been seen since 1980. Segment 8: **Unlikely**. A historical CNDDB record of this variety occurs within the proposed Project in the Whittier Narrows area. However, this variety is presumed extinct and has not been seen since 1980. Segment 10: **Unlikely**. Outside of the known range of the species. Variety is presumed extinct and has not been seen since 1980. Segment 11: **Unlikely**. This variety is known from only 5 historical populations, none of which occur near this segment. This variety is presumed extinct and has not been seen since 1980.
Parry's spineflower *Chorizanthe parryi* var. *parryi*	CNPS 3.2, FSS	Sandy or rocky openings within chaparral and coastal scrub communities. Elev. 120-6,000 ft. April-June.	Segment 4: **Unlikely**. There are no records of this variety north of the San Gabriel Mountains. A historical population in the vicinity of Lancaster was likely misidentified. Segment 5: **Unlikely**. There are no records of this variety north of the San Gabriel Mountains. A historic population in the vicinity of Lancaster was likely misidentified. Segment 6: **Possible** in the Central Region. The CNDDB reports an occurrence of this variety in the vicinity of Mt. Lowe. The range of this plant does not extend north of the Mill Creek Summit Divide. Unlikely in the Northern Region. There are no records of this variety north of the San Gabriel Mountains. A historic population in the vicinity of Lancaster was likely misidentified. Segment 7: **Possible**. Suitable habitat occurs in the foothills of the San Gabriel mountains north of Duarte and within the San Gabriel River Wash where a historical population is recorded. Segment 8: **Possible**. Suitable habitat occurs in the Puente/Chino Hills and surrounding areas. Segment 10: **Unlikely**. There are no records of this variety north of the San Gabriel Mountains. A historic population in the vicinity of Lancaster was likely misidentified. Segment 11: **Possible** in the Central and Southern Regions. The CNDDB reports an occurrence of this variety in the vicinity of Mt. Lowe. The range of this plant does not extend north of the Mill Creek Summit Divide. Suitable habitat occurs in the foothills of the San Gabriel mountains north of Altadena and La Cañada Flintridge. A historical population occurs in the Arroyo Seco Wash. Unlikely in the Northern Region. There are no records of this variety north of the San Gabriel Mountains. A historic population in the vicinity of Lancaster was likely misidentified.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Peirson's lupine *Lupinus peirsonii*	CNPS 1B.3, FSS	Gravelly soils within Joshua tree woodland, lower and upper montane coniferous forest, and pinyon and juniper woodland communities. Elev. 3,200- 8,200 ft. April-May	Segment 4: Absent~~Unlikely~~. This segment lies outside the known range of this species. Segment 5: Possible. There are known occurrences of this species in the vicinity of Rock Creek. Segment 6: Likely in the Central Region. There is an occurrence record of Peirson's lupine within Segment 6 in the vicinity of Alder Creek. Possible in the Northern Region. There are known occurrences of this species in the vicinity of Rock Creek. Segment 7: Absent~~Unlikely~~. Outside of the known range of the species. Segment 8: Absent~~Unlikely~~. Outside of the known range of the species. Segment 10: Absent~~Unlikely~~. This segment lies outside the known range of this species. Segment 11: Possible in the Northern and Central Regions. There are known occurrences of this species in the vicinity of Rock Creek. The Consortium of California Herbaria lists 26 occurrences of this species within the San Gabriel Mountains.
Peirson's morning-glory *Calystegia peirsonii*	CNPS 4.2	Chaparral, chenopod scrub, cismontane woodland, coastal scrub, lower montane coniferous forest, and valley and foothill grassland habitats. Elev. 98-4,921 ft. May-June.	Segment 4: Possible. There are several reported occurrences in the Antelope Valley. Segment 5: Present. This species was detected within 200 feet of several tower locations along this alignment. Additional records exist for Palmdale and Big Rock Creek. Segment 6: Present. This species was detected under structure M20-T3 located near milepost 20.9. This structure is scheduled for replacement. Species also detected between MP 10 and 11, MP 20 and 22, and MP 23 and 24. In addition, there is a recorded population of the species in Soledad Canyon Wash south of I-14. Additional records exist for Palmdale and Big Rock Creek. The Consortium of Herbaria reports a population in Soledad Canyon on the northern slopes of the San Gabriel Mountains. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Possible. There are several reported occurrences in the Antelope Valley. Segment 11: Possible in the Northern and Central Regions. There is a recorded population of the species in Soledad Canyon Wash south of I-14. Additional records exist for Palmdale and Big Rock Creek. The range of this species does not extend south of the Mill Creek Summit Divide.
Peirson's spring beauty *Claytonia lanceolata* var. *peirsonii*	CNPS 1B.1, FSS	Subalpine and upper montane coniferous forests on scree-covered slopes. Elev. 7,000-9,000ft. May-June.	Segment 4: ~~Unlikely~~Absent. Outside of the known range of the species, no suitable habitat exists. Segment 5: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat exists. Segment 6: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat exists. Segment 7: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat exists. Segment 8: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat exists. Segment 10: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat exists. Segment 11: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat exists.
Piute Mountains jewel-flower *Streptanthus cordatus* var. *piutensis*	CNPS 1B.2	Broadleaved Upland Forest, Closed-cone Coniferous forest, and Pinyon and Juniper Woodland habitats in clay or metamorphic soils. Elev. 3,593-5,692 ft. May-July.	Segment 4: Unlikely. This variety is known only from the southern Sierra Nevada and Tehachapi Mountains. Suitable habitat is limited to Juniper Woodland and Scrub. Segment 5: Unlikely. This segment lies outside the known range of this variety. Segment 6: Unlikely. This segment lies outside the known range of this variety. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. This variety is known only from the southern Sierra Nevada and Tehachapi Mountains. No suitable habitat is present. Segment 11: Unlikely. This segment lies outside the known range of this variety.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Piute Mountains navarretia *Navarretia setiloba*	CNPS 1B.1	Cismontane woodland, pinyon and juniper woodland, and valley and foothill grassland habitats in clay or gravelly loam soils. Elev. 1,000-6,890 ft. May-June.	Segment 4: Unlikely. This species is not known to occur south of the Tehachapi Mountains. Potentially suitable habitats for this species in this segment include Mojave Juniper Woodland and Scrub and California Annual Grassland. Segment 5: Unlikely. This species is not known to occur south of the Tehachapi Mountains. A range extension this far south into the Antelope Valley is not likely. Segment 6: Unlikely. This species is not known to occur south of the Tehachapi Mountains. A range extension this far south into the Antelope Valley is not likely. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. This species is not known to occur south of the Tehachapi Mountains. Desert Bunchgrass Grassland may provide suitable habitat for this species. Segment 11: Unlikely. This species is not known to occur south of the Tehachapi Mountains. A range extension this far south into the Antelope Valley is not likely.
Plummer's mariposa lily *Calochortus plummerae*	CNPS 1B.2, FSS	Granitic rock outcrops or rocky soils of granitic origin, in lower montane coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland, and chaparral habitats. Elev. 328-5,577 ft. May-July	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Present in the Central Region. The species was observed on Segment 6 along Rincon Red Box Road, north of Spring Camp, along Lynx Gulch Road just south of Iron Mountain, along the Alder Creek access road, and at Upper Big Tujunga Canyon. Segment 7: Possible. Suitable habitat for this species is present in the foothills of the San Gabriel Mountains north of Duarte. Segment 8: ~~Likely~~Present: Observed ~~nearby~~near the proposed Project in the Puente Hills Landfill Native Habitat Preservation Authority lands. Suitable habitat for this species is present in the Puente/Chino Hills and surrounding areas. Also present in the Chino Hills State Park. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: ~~Likely~~ Present in the Central Region. Population found along access road 3N27, south of Big Tujunga Creek crossing. Two records occur directly adjacent to the proposed Project near Long Canyon off of Highway 2, and near Mt. Lowe. Possible in the Southern Region. Suitable habitat for this species is present in the foothills of the San Gabriel Mountains north of Altadena and La Cañada Flintridge.
Pygmy alpinegold *Hulsea vestita* ssp. *pygmaea*	CNPS 1B.3, FSS	Alpine boulder and rock field, subalpine coniferous forest on granitic, gravelly soils. Elev. 9,300-12,795 ft. June-October.	Segment 4: ~~Unlikely~~Absent. Outside of known distribution and elevational range for this species, no suitable habitat. Segment 5: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat. Segment 6: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat. Segment 7: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat. Segment 8: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat. Segment 10: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat. Segment 11: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Pygmy poppy *Canbya candida*	CNPS 4.2, FSS	Joshua tree woodland, Mojavean desert scrub, or pinyon and juniper woodland habitats with gravelly, granitic, or sandy soils. Elev. 1,968-4,790 ft. March-June.	Segment 4: **Possible**. Suitable habitat for this species is present. In addition, there are several records in the vicinity of Edwards Air Force Base. Segment 5: **Possible**. Suitable habitat for this species is present, and there are several records in the vicinity of Lancaster and an occurrence 3 miles east of Vincent. Segment 6: **Possible** in the Northern and Central Regions. Suitable habitat for this species is present. There is a recorded occurrence 3 miles east of Vincent. The range of this species does not extend south of the Mill Creek Summit Divide. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Possible**. Suitable habitat for this species is present, and there are several records in the vicinity of Edwards Air Force Base. Segment 11: **Possible** in the Northern and Central Regions. Suitable habitat for this species is present. There is a recorded occurrence 3 miles east of Vincent. The range of this species does not extend south of the Mill Creek Summit Divide.
Rayless ragwort *Senecio aphanactis*	CNPS 2.2	Dry alkaline flats within chaparral, cismontane woodland, and coastal scrub communities. Elev. 50-2,624 ft. January-April.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. Outside of the known range of the species. Segment 7: **Unlikely**. The habitat conditions are marginal for this species and are either highly developed or disturbed. It is not known from foothills of the San Gabriel Mountains. Segment 8: **Possible**. A recorded population of this species occurs in Puddingstone Canyon, in the Frank G. Bonelli Regional Park. Suitable habitat exits in the Puente/Chino Hills. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. The habitat conditions are marginal for this species and are either highly developed or disturbed. It is not known from foothills of the San Gabriel Mountains.
Robinson's pepper-grass *Lepidium virginicum* var. *robinsonii*	CNPS 1B.2	Chaparral and coastal scrub habitats. Elev. below 2,903 ft. January-July.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Possible** in the Central Region. A reported population occurs between Segment 6 and 11 in the foothills of the San Gabriel Mountains north of Sierra Madre. Segment 7: **Possible**. The Consortium of California Herbaria lists a historical occurrence of this variety just east of this segment in the vicinity of Irwindale, adjacent to Interstate 210. Segment 8: **Likely**: Observed nearby in the Puente Hills Landfill Native Habitat Preservation Authority lands. The CNDDB lists an occurrence of this variety north of this segment in the vicinity of Highway 60, south of Montclair. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible** in the Central and Southern Regions. A reported population occurs between Segment 6 and 11 in the foothills of the San Gabriel Mountains north of Sierra Madre. The Consortium of California Herbaria lists a historical occurrence of this variety just east of this segment in the vicinity of Altadena off of North Craig Avenue.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Rock Creek broomrape *Orobanche valida* ssp. *valida*	CNPS 1B.2, FSS	Granitic soils within chaparral and pinyon and juniper Woodland communities. Elev. 4,000-7,000 ft. May-July.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: ~~Unlikely. Currently~~Possible. Closest known population from ~~only 3 populations, the closest of which occurs over 10~~Glendora Ridge, approximately 6 miles to the east ~~in the Mt. Baldy quadrangle~~, but found as far west as the Los Padres National Forest. Suitable habitat and elevation exists within project area. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: ~~Unlikely. Currently~~Possible. Closest known population from ~~only 3 populations, the closest of which occurs over~~Glendora Ridge, approximately 10 miles to the east ~~in the Mt. Baldy quadrangle.~~, but found as far west as the Los Padres National Forest. Suitable habitat and elevation exists within project area.
Rock monardella *Monardella viridis* ssp. *saxicola*	CNPS 4.2, FSS	Dry rocky slopes within chaparral and Lower Montane Coniferous Forest communities.1,600-6,000 ft. June-September.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Possible in the Central Region. The subspecies is endemic to the San Gabriel Mountains, and the Consortium of California Herbaria lists 13 records of this subspecies within the area. Segment 7: Possible. This subspecies is endemic to the San Gabriel Mountains. Suitable habitat for this subspecies occurs in the foothills of the San Gabriel Mountains north of Duarte. Segment 8: Unlikely. This segment lies outside the known range of this subspecies, which is restricted to the San Gabriel Mountains. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Possible in the Central and Southern Regions. The subspecies is endemic to the San Gabriel Mountains north of Altadena and La Cañada Flintridge, and the Consortium of California Herbaria lists 13 records of this subspecies within the area. Suitable habitat for this subspecies occurs in the foothills of the San Gabriel Mountains
Round-leaved filaree *Erodium macrophylla* (= *California macrophylla*)	CNPS 1B.1	On clay soils in valley and foothill grasslands or open cismontane woodland habitats. Elev. 49-3,937 ft. March-May.	Segment 4: Unlikely. The grassland habitats occurring in this segment provide marginal habitat for this species. There are no historical occurrences within the Mojave desert region. Segment 5: Unlikely. The grassland habitats occurring in this segment provide marginal habitat for this species. There are no historical occurrences within the Mojave desert region. Segment 6: Unlikely: The grassland habitats occurring in this segment provide marginal habitat for this species. There are no historical occurrences within the Mojave desert region. ~~Unlikely.~~ Only marginal habitat is present within the proposed Project. The only record of this species in the San Gabriel Mountains is in the vicinity of Elizabeth Lake. Segment 7: Unlikely. Only marginal habitat is present and is either highly developed or disturbed. This species is not known to occur in the foothills of the San Gabriel Mountains. Segment 8: Possible: Suitable habitat occurs in the Puente/Chino Hills and surrounding areas. Segment 10: Unlikely. The grassland habitats occurring in this segment provide marginal habitat for this species. There are no historical occurrences within the Mojave desert region. Segment 11: Unlikely. The grassland habitats occurring in this segment provide marginal habitat for this species. There are no historical occurrences within the Mojave desert region. Only marginal habitat is present within the Central Region. The only record of this species in the San Gabriel Mountains is in the vicinity of Elizabeth Lake. Only marginal habitat is present in the Southern Region and area is either highly developed or disturbed. This species is not known to occur in the foothills of the San

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			Gabriel Mountains.
Salt spring checkerbloom *Sidalcea neomexicana*	CNPS 2.2	Chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub, and playa habitats in alkaline and mesic soils. Elev. 49-5,020 ft. March-June.	Segment 4: **Unlikely**. There are no recorded occurrences of the species in the Antelope Valley or the northern San Gabriel Mountains. Segment 5: **Unlikely**. There are no recorded occurrences of the species in the Antelope Valley or the northern San Gabriel Mountains. Segment 6: **Unlikely**. There are no recorded occurrences of the species in the Antelope Valley or the northern San Gabriel Mountains. Although suitable habitat is present in the Central Region, there are no records of this subspecies in the San Gabriel Mountains. Segment 7: **Possible**. Suitable habitat exists within the in the Whittier Narrows Rec. Area. Segment 8: **Possible**. A population record for this species occurs within the proposed Project in the vicinity of Chino Creek just east of Highway 71. Segment 10: **Unlikely**. There are no recorded occurrences of the species in the Antelope Valley or the northern San Gabriel Mountains. Segment 11: **Unlikely**. Although suitable habitat is present in the Central Region, there are no recorded occurrences of the species in the Antelope Valley or the San Gabriel Mountains. In the Southern Region, habitat conditions are marginal for this species and are either highly developed or disturbed.
San Bernardino aster *Aster bernardinus* (=*Symphyotrichum defoliatum*)	CNPS 1B.2, FSS	Cismontane woodland, coastal scrub, lower montane coniferous forest, meadows and seeps, marshes and swamps, and valley and foothill grassland habitats within vernally mesic areas near ditches, and streams. Elev. 7-6,693 ft. July-November.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Possible** in the Central Region. A population of this species is reported to occur on the Prairie Fork of the San Gabriel River within the ANF. Segment 7: **Possible**. Suitable habitat for this species exists in the Whittier Narrows area and along the San Gabriel River channel. Segment 8: **Possible**. Two records occur within 5 miles of the proposed Project between Pomona and Ontario. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible** in the Central Region. A population of this species is reported to occur on the Prairie Fork of the San Gabriel River within the ANF. Unlikely in the Northern and Southern Regions. Only marginal habitat for this species is present in the Los Angeles Basin and is either highly developed or disturbed.
San Bernardino grass-of-Parnassus *Parnassia cirrata* (=*Parnassia cirrata var. cirrata)*	CNPS 1B.3, FSS	Streams and mesic sites within lower and upper montane coniferous forests and meadows and seeps. Elev. 4,100-8,000 ft. August-September.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Possible**. There are records of this species along the San Gabriel River and within Alder Gulch. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible**. There are records of this species along the San Gabriel River and within Alder Gulch.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
San Fernando Valley spineflower *Chorizanthe parryi* var. *Fernandina*	CNPS 1B.1, FC, SE, FSS	~~Sandy or rocky openings within chaparral and coastal~~Coastal sage scrub~~ communities.~~, alluvial fan scrub, non-native grassland, and disturbed habitats on sandy or gravelly soils, dry washes, flats and foothills. Elev. 490-4,000 ft. April-June.	Segment 4: Unlikely. This segment lies outside the known range of this variety. Segment 5: Possible. Suitable habitat may be present at the base of the San Gabriel Mountains. A historical population occurs 5 miles to the west in the vicinity of Elizabeth Lake. Segment 6: ~~Possible~~Unlikely in the Northern and Central Regions. ~~Suitable habitat may be present at the base~~ Outside of ~~the San Gabriel Mountains. A historical occurrence occurs 5 miles to the west in the vicinity of Elizabeth Lake.~~historic range, but marginal habitat exists. Segment 7: Possible. This variety is currently known from only 2 populations. However, suitable habitat exists within the proposed Project on sandy soils within the San Gabriel River channel. Segment 8: Possible. This variety is currently known from only 2 populations. However, suitable habitat exists within the proposed Project on sandy soils within the Puente/Chino Hills. Segment 10: Unlikely. This segment lies outside the known range of this variety. Segment 11: ~~Possible. Suitable habitat may be present at the base of the San Gabriel Mountains. A historical occurrence occurs 5 miles to the west in the vicinity of Elizabeth Lake.~~ Unlikely. Outside of historic range, but marginal habitat exists.
San Gabriel bedstraw *Galium grande*	CNPS 1B.2, FSS	Open chaparral, oak woodland, or similar woodland communities including stands of Bigcone Fir. Elev. 3,000-6,000 ft. January-July.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Present in the Central Region. The species was observed immediately adjacent to the proposed Project along the Monrovia Canyon Truck Trail between White Saddle and Mt. Bliss. Suitable habitat also occurs along portions of Van Tassel Truck Trail and Sawpit Truck Trail. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Possible in the Central Region. There are several records of this species within 5 miles of the proposed Project.
San Gabriel linanthus *Linanthus concinnus*	CNPS 1B.2, FSS	Dry rocky slopes within chaparral and montane coniferous forest communities. Elev. 5,000-9,200 ft. May-July.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Possible in the Central Region. A population of this species is reported to occur between Segment 6 and 11 in the vicinity of Mt. Lowe. This occurrence is within 5 miles of the proposed Project. There are 38 records of this species in the San Gabriel Mountains. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Possible in the Central Region. A population of this species reported to occur between Segment 6 and 11 in the vicinity of Mt. Lowe. This occurrence is within 5 miles of the proposed Project. There are 38 records of this species in the San Gabriel Mountains.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
San Gabriel manzanita *Arctostaphylos gabrielensis*	CNPS 1B.2, FSS	Rocky chaparral habitats. Elev. 5,000 ft. March.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Present** in the Central Region. This species was observed within the proposed Project in the vicinity of Mill Creek Summit Divide. Suitable habitat also occurs along access roads from Mill Creek Summit to Big Tujunga Creek. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Present** in the Central Region. This species occurs in close proximity to Mill Creek Summit Divide, the type locality of this species and was detected within 200 feet of tower locations 30, 31, and 33 of this alignment. Suitable habitat occurs along 4N24 on either side of Mount Gleason Road.
San Gabriel Mountains dudleya *Dudleya densiflora*	CNPS 1B.1, FSS	Chaparral, coastal scrub, and lower montane coniferous forest habitats on granitic cliffs and canyon walls. Elev. 800-2,000 ft. March-July.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Present** in the Central Region. This species was detected along the road cut of Van Tassel Truck Trail during 2008 surveys. This is a significant population as the species was previously only known from Fish Canyon. Segment 7: **Possible**. This segment is adjacent to Fish Canyon, where the species is known to occur. Segment 8: **Unlikely**. This segment lies outside the known range of this species. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. ~~There are no records of the species within 5 miles of the proposed Project.~~ The species ~~is~~ was previously known only from the foothill canyons north of Azusa, but was detected along Segment 6 in 2008.
San Gabriel Mountains sunflower *Hulsea vestita* ssp. *gabrielensis*	CNPS 4.3, FSS	Rocky habitats within lower and upper montane coniferous forest communities. Elev. 4,000-8,200 ft. May-July.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Present** in the Central Region. A population record for this subspecies occurs between Segment 6 and 11 on Mt. Gleason Rd. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible** in the Central Region. A population record for this subspecies occurs between Segment 6 and 11 on Mt. Gleason Rd.
San Gabriel oak *Quercus durata* var. *gabrielensis*	CNPS 4.2	Granitic soils within chaparral and Cismontane Woodland communities. Elev. 1,476-3,281 ft. April-May.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Present** in the Central Region. This variety is endemic to the San Gabriel Mountains and was observed within stands of Mixed Chaparral and Scrub Oak Chaparral throughout the southern half of this segment. Segment 7: **Possible**. Suitable habitat for this species occurs in the foothills of the San Gabriel Mountains north of Duarte. Segment 8: **Unlikely**. This segment lies outside the known range of this subspecies, which is restricted to the San Gabriel Mountains. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Present** in the Central Region. This variety is endemic to the San Gabriel Mountains and was observed within stands of Mixed Chaparral and Scrub Oak Chaparral throughout the southern half of this area. Possible in the Southern Region. This subspecies is endemic to the San Gabriel Mountains. Suitable habitat for this subspecies occurs in the foothills of the San

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			Gabriel Mountains north of Altadena and La Cañada Flintridge.
San Gabriel River dudleya *Dudleya cymosa* ssp. *crebrifolia*	CNPS 1B.2, FSS	Granitic slopes in chaparral communities. Elev. 900-1,300 ft. April-July.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: ~~Possible~~Present. This subspecies was detected along the road cut of Sawpit Truck Trail during 2008 and 2009 surveys.~~This subspecies is primarily known from Fish Canyon in the southern San Gabriel Mountain foothills. This segment is adjacent to Fish Canyon.~~ Segment 7: Possible. The portions of this segment within the foothills of the San Gabriel Mountains are in close proximity to Fish Canyon, where the plant is known to occur. Segment 8: Unlikely. This segment lies outside the known range of this subspecies. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: ~~Present~~Unlikely. This subspecies is primarily known from Fish Canyon in the southern San Gabriel Mountain foothills, near Segment 6. ~~This subspecies was detected along the road cut of Sawpit Truck Trail during 2008 surveys.~~ Unlikely in the Northern and Southern Regions as they are outside of the known range of the species.
Scalloped Moonwort *Botrychium crenulatum*	CNPS 2.2, FSS	Freshwater bogs, fens, marshes, swamps, meadows, seeps, and mesic areas of lower montane coniferous forests. Elev. 4,921-10,761 ft. June-September.	Segment 4: Unlikely. Suitable habitat does not occur. Segment 5: Unlikely. Suitable habitat does not occur. Segment 6: Unlikely. There are no records of this species within 5 miles of the proposed Project. Only marginal habitat for this species is present. Segment 7: Unlikely. Suitable habitat does not occur. Segment 8: Unlikely. Suitable habitat does not occur. Segment 10: Unlikely. Suitable habitat does not occur. Segment 11: Unlikely. There are no records of this species within 5 miles of the proposed Project. Only marginal habitat for this species is present.
Short-joint beavertail *Opuntia basilaris* var. *brachyclada*	CNPS 1B.2, FSS	Open chaparral, Juniper Woodland, or similar woodland communities. Elev. 1,394-5,900 ft. April-June.	Segment 4: Unlikely. This variety is known only from the northern desert slopes of the San Gabriel and San Bernardino Mountains. Segment 5: Likely. A recorded population occurs within the proposed Project alignment of this Segment. Segment 6: Present in the Central Region. This variety was detected within 200 feet of several tower locations along the alignment. Any access road from Vincent to Mill Creek Summit and Mount Gleason areas should be considered suitable habitat. Likely in the Northern Region. A recorded population occurs within the proposed Project alignment of this Segment. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. This variety is known only from the northern desert slopes of the San Gabriel and San Bernardino Mountains. Segment 11: Present in the Central Region. This variety was detected along the road cut of 4N24 just south of Aliso Canyon Road during 2008 surveys. Any access road from Vincent to Mill Creek Summit and Mount Gleason areas should be considered suitable habitat. Likely in the Northern Region. A recorded population occurs within the proposed Project alignment of this Segment.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Slender mariposa lily *Calochortus clavatus* var. *gracilis*	CNPS 1B.2, FSS	Valley and foothill grasslands, chaparral, or coastal scrub habitats; often in shaded canyons. Elev. 1,181-3,281 ft. March-June.	Segment 4: **Unlikely**. This segment lies outside the known range of this variety, which is endemic to the Transverse Range. Segment 5: **Unlikely**. This variety is endemic to the Transverse Range; however, there are no occurrences on the northern desert slopes of the San Gabriel Mountains. Segment 6: **Possible** in the Central Region. A population record for this variety occurs within 5 miles of the proposed Project in the vicinity of Cogswell Reservoir. Unlikely in the Northern Region. This variety is endemic to the Transverse Range; however, there are no occurrences on the northern desert slopes of the San Gabriel Mountains. Segment 7: **Possible**. There are numerous historical reports of this variety within the foothills of the San Gabriel Mountains. Segment 8: **Possible**. Suitable habitat for this variety is present within the Puente/Chino Hills and surrounding areas. Segment 10: **Unlikely**. This segment lies outside the known range of this variety, which is endemic to the Transverse Range. Segment 11: **Possible** in the Central and Southern Regions. A population record for this variety occurs within 10 miles of the proposed Project and suitable habitat is present. There are numerous reports of the plant within the foothills of the San Gabriel Mountains. Unlikely in the Northern Region. This variety is endemic to the Transverse Range, however, there are no occurrences on the northern desert slopes of the San Gabriel Mountains.
Slender silver-moss *Anomobryum julaceum*	CNPS 2.2	Rocky areas and talus slopes within lower montane coniferous forests, or areas within Coulter pine stands. Any road cut areas should be considered suitable habitat. Elev. 328-3,281.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Possible** in the Central Region. Suitable habitats include rocky areas and talus slopes within Bigcone Douglas Fir-Canyon Live Oak Forest and Coulter Pine Forest. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible** in the Central Region. Suitable habitats include rocky areas and talus slopes within Bigcone Douglas Fir-Canyon Live Oak Forest and Coulter Pine Forest.
Slender-horned spineflower *Dodecahema leptoceras*	CNPS 1B.1, SE, FE	Pleistocene alluvial wash communities. Sandy ~~beaches~~soils of alluvial fans and ~~floodplain~~sandy stream terraces ~~associated~~ with ~~alluvial fan scrub vegetation within~~ chaparral, cismontane woodland, and coastal sage scrub ~~communities~~. Associated with elevation terraces. Elev. 656-2,500 ft. April-June.	Segment 4: **Unlikely**. Outside of the known range of the species and no suitable habitat exists. Segment 5: **Unlikely**. Outside of the known range of the species and no suitable habitat exists. Segment 6: **Possible** in the Central Region. There is suitable habitat for this species in the southern foothills of the San Gabriel Mountains. Segment 7: **Possible**. A historical population of this species occurs just west of the proposed Project in the foothills of the San Gabriel Mountains north of Monrovia Segment 8: Unlikely. ~~Possible. Although t~~There are no historical records of this species within the immediate vicinity of this segment, sandy substrates in the Puente/Chino Hills may offer suitable habitat. Segment 10: **Unlikely**. Outside of the known range of the species and no suitable habitat exists. Segment 11: **Possible** in the Central and Southern Regions. A historical population of this species occurs where this segment crosses the Rubio wash. However, the population is presumed extirpated due to urbanization and streambed modification for flood control.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Smooth tarplant *Hemizonia pungens* ssp. *laevis* (=*Centromadia pungens* ssp. *laevis*)	CNPS 1B.1	Chenopod scrub, meadows and seeps, playas, riparian woodland, and valley and foothill grassland habitats in alkaline soils. Elev. below 1,575 ft. April-September.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. Outside of the known range of the species. Segment 7: **Unlikely**. There are no records of this subspecies occurring within Los Angeles County. In addition, habitat conditions along this segment are marginal. Segment 8: **Possible**. Although there are no records of this subspecies within Los Angeles County, there are several populations in San Bernardino and Riverside counties adjacent to the Los Angeles County border. There is suitable habitat within the Puente/Chino Hills area. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. There are no records of this subspecies occurring within Los Angeles County. In addition, habitat conditions along this segment are marginal.
Sonoran maiden fern *Thelypteris puberula* var. *sonorensis*	CNPS 2.2, FSS	Meadows and seeps within streams. Elev. 164-2,000 ft. January-September.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Possible** in the Central Region. There are 3 reported populations of this variety within 5 miles of the proposed Project. The potential for occurrence is restricted to suitable habitats south of the Mill Creek Summit Divide. Segment 7: **Possible**. Suitable habitat for this species occurs in the foothills of the San Gabriel Mountains north of Duarte. Segment 8: **Unlikely**. All reported populations of this variety within Los Angeles County are from the Transverse Range. There are no records or data that indicate that this plant could occur within the Los Angeles Basin. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible** in the Central and Southern Regions. There are 3 reported populations of this variety within 5 miles of the proposed Project. The potential for occurrence is restricted to suitable habitats south of the Mill Creek Summit Divide. Suitable habitat for this variety occurs in the foothills of the San Gabriel Mountains north of Altadena and La Cañada Flintridge.
Southern alpine buckwheat *Eriogonum kennedyi* var. *alpigenum*	CNPS 1B.3, FSS	Alpine boulder and rock field, granitic/gravelly soils in subalpine coniferous forest. Elev. 8,530-11,480 ft. July-September.	Segment 4: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat found. Segment 5: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat found. Segment 6: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat found. Segment 7: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat found. Segment 8: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat found. Segment 10: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat found. Segment 11: Absent~~Unlikely~~. Outside of known distribution and elevational range for this species, no suitable habitat found.
Southern jewel-flower *Streptanthus campestris*	CNPS 1B.3, FSS	Chaparral, lower montane coniferous forest, rocky pinyon and juniper woodland. Elev. 2,950-7,550 ft. May-July.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. Although suitable habitat is present in the Central Region, there are no records of this species in Los Angeles County. Segment 7: **Unlikely**. Outside of the known range of the species. Segment 8: **Unlikely**. Outside of the known range of the species. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. Although suitable habitat is present in the Central Region, there are no records of this species in Los Angeles County.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Southern skullcap *Scutellaria bolanderi* ssp. *austromontana*	CNPS 1B.2, FSS	Mesic sites within chaparral, Cismontane Woodland, and Lower Montane Coniferous Forest Communities. Elev. 1,900-6,600 ft. June-August.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. Although suitable habitat is present in the Central Region, there are no records of this subspecies in the San Gabriel Mountains. Segment 7: **Unlikely**. There is only 1 historical occurrence of this plant within Los Angeles County. Segment 8: **Unlikely**. There is only 1 historical occurrence of this plant within Los Angeles County. In addition, this segment is below the known lower elevation limit of the subspecies. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. Although suitable habitat is present, there are no records of this subspecies in the San Gabriel Mountains. There is only 1 historical occurrence of this plant within Los Angeles County.
Southern tarplant *Hemizonia parryi* ssp. *australis* (=*Centromadia parryi* ssp. *australis*)	CNPS 1B.1	Margins of marshes and swamps, vernally mesic sites within valley and foothill grassland, vernal pools, and coastal scrub. Elev. below 1,400 ft. May-November.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. Outside of the known range of the species. Segment 7: **Possible**. Suitable habitat for this subspecies exists in the Whittier Narrows area and any disturbed Coastal Sage Scrub habitat. Segment 8: **Possible**. Suitable habitat for this subspecies exists within the Whittier Narrows area and in the Puente/Chino Hills area. A historical population occurs just south of segment 8 on the southern slopes of the Chino Hills just north of Yorba Linda. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Possible** in the Southern Region. Suitable habitat may exist within any disturbed Coastal Sage Scrub communities.
Thread-leaved brodiaea *Brodiaea filifolia*	CNPS 1B.1, SE, FT	Open mesic grasslands within chaparral, cismontane woodland, or coastal scrub communities, and is frequently associated with playas or vernal pools. Elev. 80-2,900 ft. March-June.	Segment 4: **Unlikely**. Outside of the known range of the species. Segment 5: **Unlikely**. Outside of the known range of the species. Segment 6: **Unlikely**. The closest population of this species occurs greater than 5 miles away from the proposed Project. In addition, suitable grassland habitat for this species is not present within this segment. Segment 7: **Unlikely**. The nearest population of this species occurs greater than 5 miles away from the proposed Project. In addition, the grassland habitat along this segment is marginal for this species and is highly disturbed. Segment 8: **Possible**. Grassland communities within the Puente/Chino Hills area offer suitable habitat for this species, but only a small proportion of the available grassland within the alignment or alternatives is appropriately mesic with relatively level topography and a high proportion of native grasses. Segment 10: **Unlikely**. Outside of the known range of the species. Segment 11: **Unlikely**. The closest population of this species occurs greater than 5 miles away from the proposed Project. In addition, suitable grassland habitat for this species is not present within this segment.

Table 3.4-6. Special-Status Plants with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Transverse Range phacelia *Phacelia exilis*	CNPS 4.3, FSS	Meadows and seeps or sandy and gravelly areas within lower and upper montane coniferous forest communities. Elev. 3,608-8,858 ft. May-August.	Segment 4: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat found. Segment 5: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat found. Segment 6: Absent~~Unlikely~~. The nearest recorded populations occur in the San Bernardino Mountains, no suitable habitat found. Segment 7: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat found. Segment 8: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat found. Segment 10: Absent~~Unlikely~~. Outside of the known range of the species, no suitable habitat found. Segment 11: Absent~~Unlikely~~. The nearest recorded populations occur in the San Bernardino Mountains, no suitable habitat found.
Urn-flowered alumroot *Heuchera elegans*	CNPS 4.3, FSS	Rocky habitats within cismontane woodland and lower and upper montane coniferous forest communities. Elev. 3,700-8,500 ft. May-June.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Present in the Central Region. The species was observed immediately adjacent to the proposed Project along 4N18, just north of Monte Cristo Creek. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Possible in the Central Region. The Consortium of California Herbaria lists 55 occurrence records within the San Gabriel Mountains.
White-bracted spineflower *Chorizanthe xanti* var. *leucotheca*	CNPS 1B.2	Mojavean desert scrub and pinyon and juniper woodland habitats. Elev. 984-3,937 ft. April-June.	Segment 4: Unlikely. Although suitable habitat is present, there are no reports of this variety occurring north of the Transverse Range. Segment 5: Possible. There is a recorded occurrence of this variety just west of Segment 5 in the foothills of the San Gabriel Mountains. Segment 6: Possible in the Northern and Central Regions. There is a recorded occurrence of this variety just west of Segment 5 in the foothills of the San Gabriel Mountains. The CNDDB reports a population just north of Palmdale in the northern foothills of the San Gabriel Mountains. The range of this variety does not extend south of the Mill Creek Summit Divide. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Although suitable habitat is present, there are no reports of this variety occurring north of the Transverse Range. Segment 11: Possible in the Northern and Central Regions. There is a recorded occurrence of this variety just west of Segment 5 in the foothills of the San Gabriel Mountains. The CNDDB reports a population just north of Palmdale in the northern foothills of the San Gabriel Mountains. The range of this variety does not extend south of the Mill Creek Summit Divide.
Woolly mountain-parsley *Oreonana vestita*	CNPS 1B.3, FSS	Subalpine and upper and lower montane coniferous forest. Elev. 5,300-11,480 ft. May-September.	Segment 4: Unlikely. Outside of the known range of the species. Segment 5: Unlikely. Outside of the known range of the species. Segment 6: Unlikely. This segment is outside of known elevational range for this species. Segment 7: Unlikely. Outside of the known range of the species. Segment 8: Unlikely. Outside of the known range of the species. Segment 10: Unlikely. Outside of the known range of the species. Segment 11: Possible in the Central Region. Suitable habitat occurs near Mount Gleason.

FE –Federally listed Endangered
FT – Federally listed Threatened
FC – Federal Candidate for listing
SE – California-listed Endangered
ST – California-listed Threatened
SR – California-listed Rare

FSS – USDA Forest Service Sensitive Species
FSW – USDA Forest Service Watch List
CNPS 1A – Presumed extinct in California
CNPS 1B – Rare or endangered in California and elsewhere
CNPS 2 – Rare or endangered in California, more common elsewhere
CNPS 3 – More information needed (Review List)

CNPS 4 – Limited Distribution (Watch List)
0.1 = Seriously threatened in California (over 80% of occurrences threatened/ high degree and immediacy of threat)
0.2 = Fairly threatened in California (20-80% occurrences threatened)
0.3 = Not very threatened in California (<20% of occurrences threatened or no current threats known

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
INVERTEBRATES			
Delhi Sands Flower-Loving Fly (*Rhaphiomidas terminatus abdominalis)*	FE	Endemic to the Colton Dunes. Inhabits areas with Delhi soil series.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat is present within the project area, outside of the known range of this species. Segment 5: ~~Unlikely. No suitable habitat is present within the project area~~ ~~Segment 6: Unlikely~~Absent. No suitable habitat is present within the project area, outside of the known range of this species. Segment 6: Absent. No suitable habitat is present within the project area, outside of the known range of this species. Segment 7: ~~Unlikely~~Absent. No suitable habitat is present within the project area, outside of the known range of this species. Segment 8: ~~Unlikely~~Absent. No suitable habitat is present within the project area Segment 10: ~~Unlikely~~Absent. No suitable habitat is present within the project area, outside of the known range of this species. Segment 11: ~~Unlikely~~Absent. No suitable habitat is present within the project area, outside of the known range of this species.
Quino Checkerspot Butterfly (*Euphydryas editha quino*)	FE	Grasslands, coastal sage scrub, chamise chaparral, red shank chaparral, juniper woodland, and semi-desert scrub that support native species of plantain, the ~~butterflfly's~~butterfly's primary larval host plant. This checkerspot can also ~~can~~ be found at the lower edge of the chaparral, in desert canyons, and in canyon washes.	Segment 4: ~~Unlikely. No~~Absent. Project area is outside of known range, no suitable habitat~~ is present within the project area~~. Segment 5: ~~Unlikely. No~~Absent. Project area is outside of known range, no suitable habitat~~ is present within the project area~~. Segment 6: ~~Unlikely. No~~Absent. Project area is outside of known range, no suitable habitat~~ is present within the project area~~. Segment 7: Unlikely. ~~No suitable~~Project area is outside of known range marginal habitat ~~is present within the project area~~exists. USFWS considers the taxa extirpated from Los Angeles and San Bernardino counties. Segment 8: Unlikely. ~~No suitable~~Project area is outside of known range, marginal habitat ~~is present within the project area~~exists. USFWS considers the taxa extirpated from Los Angeles and San Bernardino counties. Segment 10: ~~Unlikely. No~~Absent. Project area is outside of known range, no suitable habitat~~ is present within the project area~~. Segment 11: ~~Unlikely. No~~Absent. Project area is outside of known range, no suitable habitat~~ is present within the project area~~.
Riversidian fairy shrimp (*Streptocephalus woottoni*)	FE	Restricted to deep vernal pools and ponds with chemistry and temperature conditions specific to non-marine and non-riverine waters. All known vernal pool habitat lies within annual grasslands, which may be interspersed with chaparral or coastal	Segment 4: ~~Unlikely.~~Absent. No vernal pools were found within the project area, outside of the known range of this species. Segment 5: ~~Unlikely. No vernal pools were found within the project area~~ ~~Segment 6: Unlikely~~Absent. No vernal pools were found within the project area, outside of the known range of this species. Segment 6: Absent. No vernal pools were found within the project area, outside of the known range of this species. Segment 7: ~~Unlikely~~Absent. No vernal pools were found within the project area Segment 8: ~~Unlikely~~Absent. No vernal pools were found within the project area Segment 10: ~~Unlikely.~~Absent. No vernal pools were found within the project area, outside of the known range of this species. Segment 11: ~~Unlikely~~Absent. No vernal pools were found within the project area

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
		sage scrub vegetation.	
FISH			
Arroyo Chub *Gila orcuttii*	FSS, CSSC	Occur in slow-moving or backwater sections of warm to cool streams with mud or sand substrates. Spawning occurs in pools or in quiet edge waters.	Segment 4: Unlikely. Low suitability habitat is present Segment 5: Unlikely. Low suitability habitat is present Segment 6: Present in the Central Region; Detected in West Fork of the San Gabriel River. Unlikely in the Northern Region; Low suitability habitat is present. Segment 7: Unlikely. Habitat is ~~not suitable~~marginal and location is outside of the known range for this species. Segment 8: Possible under Alternative 4 only; Known from portions of the Santa Ana River. Aliso Creek and unnamed tributaries in this segment drain into the Santa Ana River. Segment 10: Unlikely. Low suitability habitat is present Segment 11: Present in the Central Region; Although not detected during recent surveys conducted by CDFG, this species is known to occur and suitable habitat occurs along portions of Big Tujunga Creek in the Project area (J. O'Brien, Associate Fisheries Biologist, CDFG. Pers. comm.) Unlikely in the Northern and Southern Regions; Low suitability habitat is present in the north, however, in the south habitat is not suitable and location is outside of the known range for this species.
Santa Ana Speckled Dace *Rhinichthys osculus*	FSS, CSSC	Inhabit various stream and channel types, small springs, brooks, and pools in intermittent streams and perennial rivers.	Segment 4: ~~Unlikely.~~Absent. Outside of the known range, no suitable habitat. Segment 5: ~~Unlikely~~Absent. Outside of the known range, no suitable habitat. Segment 6: Present. Detected in West Fork and Upper West Fork of the San Gabriel River. Unlikely in the Northern Region; Outside of the known range. Segment 7: Unlikely. Outside of the known range, marginal habitat present. Segment 8: ~~Possible under Alternative 4~~Unlikely. This species is only~~; Known from~~ found in the upper portions of the Santa Ana River~~. Aliso Creek~~ watershed and ~~unnamed tributaries in this segment drain into the Santa Ana River.~~limited to one creek (R. Rodriguez, CDFG, pers. comm.). Segment 10: ~~Unlikely~~Absent. Outside of the known range, no suitable habitat. Segment 11: Present. Although not detected during recent surveys conducted by CDFG, this species is known to occur and suitable habitat occurs along portions of Big Tujunga Creek in the Project area. Unlikely in the Northern and Southern Regions; Outside of the known range.
Santa Ana Sucker *Catostomus santaanae*	FT, CSSC	Inhabit small, shallow streams and rivers; typically prefer coarse substrates consisting of gravel, rubble, and boulders, but will occur in areas with sandy or muddy substrates.	Segment 4: ~~Unlikely.~~Absent. Outside of the known range, no suitable habitat. Segment 5: ~~Unlikely~~Absent. Outside of the known range, no suitable habitat. Segment 6: Present. Known to occur along portions of the west fork of the San Gabriel east of Cogswell Dam. Also known from Big Tujunga Creek downstream of the Reservoir. Unlikely in the Northern Region; Outside of the known range. Segment 7: Unlikely. Outside of the known range, marginal habitat present. Segment 8: Possible under Alternative 4 only; Known from portions of the Santa Ana River. Aliso Creek and unnamed tributaries in this segment drain into the Santa Ana River. Segment 10: ~~Unlikely.~~Absent. Outside of the known range, no suitable habitat. Segment 11: Present in the Central Region; Known to occur along portions of Big Tujunga Creek downstream of Big Tujunga Dam. This species was introduced into the Santa Clara River system (Moyle 1976; Swift et al. 1993). Unlikely in the Northern and Southern Regions; Outside of the known range. CRITICAL HABITAT IS DESIGNATED FOR THIS SPECIES ALONG THE WEST FORK OF THE SAN GABRIEL RIVER

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			DOWNSTREAM OF COGSWELL DAM AND BIG TUJUNGA CANYON DOWNSTREAM OF BIG TUJUNGA DAM.
Unarmored Threespine Stickleback *Gasterosteus aculeatus williamsoni*	FE, SE, CDFG FP	Prefer quiet water bodies with abundant aquatic vegetation, backwaters, and stream channel margins where water flow velocities are low; require clear waters for feeding.	Segment 4: ~~Unlikely.~~Absent. Outside of the known range of this species, no suitable habitat. Segment 5: ~~Unlikely~~Absent. Outside of the known range of this species, no suitable habitat. Segment 6: Unlikely. In the Central Region, this subspecies is restricted to the Upper Santa Clara River and its watershed along stretches of Soledad Canyon, San Francisquito Canyon, Bouquet Creek, and Escondido Canyon in Los Angeles County. The Northern Regions is outside of the known range for this species. Segment 7: Unlikely. Outside of the known range of this species, marginal habitat present. Segment 8: ~~Unlikely~~Absent. Outside of the known range of this species. Segment 10: ~~Unlikely~~Absent. Outside of the known range of this species, no suitable habitat. Segment 11: Unlikely. In the Central Region, this subspecies is restricted to the Upper Santa Clara River and its watershed along stretches of Soledad Canyon, San Francisquito Canyon, Bouquet Creek, and Escondido Canyon in Los Angeles County. Northern and Southern Regions are Outside of the known range of this species.
AMPHIBIANS			
Arroyo Toad *Bufo californicus*	FE, CSSC	Prefers sandy arroyos and drainage bottoms in 3rd- to greater-order streams with open riparian vegetation in inland valleys and foothills; also may use flooded agricultural fields and irrigation ditches.	Segment 4: ~~Unlikely.~~Absent. No suitable breeding habitat exists, and this segment lies well outside the known range of the species. Segment 5: Unlikely. Although potential habitat exists in the Amargosa Creek system, this area lies outside the known range of the species. Not detected during focused surveys conducted in 2006 or reconnaissance surveys conducted in 2007. Segment 6: Present in the Central Region only; This species has been detected in Alder Creek, Mill Creek, Upper Big Tujunga Creek, and Lynx Gulch, and suitable habitat is present in several other unnamed drainages. Possible in the Northern Region; Potential breeding habitat exists in Kentucky Wash, ~~north~~ south of the Vincent Substation although they were not detected here during 2008 and 2009 protocol-level surveys. Segment 7: Unlikely. Marginal habitat is present at the San Gabriel River. Habitat along this reach of the river is highly disturbed and degraded. Segment 8: Unlikely. Marginal habitat is present at the San Gabriel River. Segment 10: ~~Unlikely.~~Absent. No suitable breeding habitat exists, and this segment lies well outside the known range of the species. Segment 11: Likely in the Central Region only; High quality habitat is present in Big Tujunga Creek, and occurrence records exist from the vicinity. Suitable habitat is present in several other unnamed drainages. Possible in the Northern Region; Potential breeding habitat exists in Kentucky Wash, ~~north~~ south of the Vincent Substation~~.~~ although they were not detected here during 2008 and 2009 protocol-level surveys. Unlikely in the southern Region; Marginal habitat is present at Eaton Wash, immediately south of ANF. Surveys were conducted in Arroyo Seco and no toads were detected in 2001. CRITICAL HABITAT FOR THIS SPECIES IS PROPOSED IN SEGMENTS 6 AND 11 (UPPER BIG TUJUNGA, MILL, AND ALDER CREEKS).
California Red-legged Frog *Rana draytonii*	FT, CSSC	Inhabits permanent and semi-permanent aquatic habitats, such as creeks and cold-water ponds, with emergent and submergent	Segment 4: ~~Unlikely.~~Absent. No suitable breeding habitat exists, and this segment lies well outside the known range of the species. Segment 5: Possible. ~~Suitable~~Moderate suitable habitat exists in the Amargosa Creek system, and there is a CNDDB record of a population ~~located~~ documented in 1996 located in an artesian pond adjacent to Amargosa Creek approximately 2.4 miles from the Project crossing with Amargosa Creek ~~crossing~~. ~~Red~~Surveys conducted in subsequent years in adjacent Amargosa Creek were negative. California red-legged frogs are known to move 2-3 miles upstream and downstream in a stream corridor. ~~The species was not~~Not detected during focused surveys in 2006 ~~or reconnaissance surveys in~~ , 2007, and 2008.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
		vegetation. May aestivate in rodent burrows or cracks during dry periods.	Segment 6: Possible. Although suitable habitat exists in Upper Big Tujunga Canyon and other drainages nearby, species is extremely rare in the mountains of Southern California. ~~Unlikely in the Northern Region~~Nearest known population is in Aliso Canyon near Segment 11; No suitable breeding habitat exists within Segment 6 north of the ANF. Segment 7: Unlikely. Likely extirpated. Segment 8: Unlikely. Likely extirpated. Segment 10: ~~Unlikely.~~Absent. No suitable breeding habitat exists, and this segment lies well outside the known range of the species. Segment 11: ~~Possible~~ Present in the Central Region ~~only~~; A newly discovered population was detected in Aliso Canyon in Sept. 2009 about 0.8 miles downstream from the alignment. ~~Although s~~Suitable habitat exists in Upper Big Tujunga Canyon and other drainages nearby, species is extremely rare in the mountains of Southern California. ~~Unlikely in the Northern Region; No suitable breeding habitat exists within Segment 11 north of the ANF. although historical records exist in the foothills nearby in Aliso Canyon.~~ Unlikely in the Southern Region; Likely extirpated.
Foothill Yellow-legged Frog *Rana boylii*	FSS, CSSC	Inhabits shallow, small to medium-sized, rocky streams, from sea level to about 6,365 feet.	Segment 4: ~~Unlikely.~~Absent. Suitable habitat is absent, and these segments lie outside the current known range of the species. Segment 5: ~~Unlikely.~~Absent. Suitable habitat is absent, and these segments lie outside the current known range of the species. Segment 6: Possible. Suitable habitat exists in Upper Tujunga Canyon and nearby creeks and drainages. Historic use of San Gabriel River, both in the west fork and Fish Canyon are known. ~~Unlikely~~Absent in the Northern Region; Suitable habitat is absent, and these segments lie outside the current known range of the species. Segment 7: ~~Unlikely.~~Absent. Suitable habitat is absent, and these segments lie outside the current known range of the species. Segment 8: ~~Unlikely.~~Absent. Suitable habitat is absent, and these segments lie outside the current known range of the species. Segment 10: ~~Unlikely.~~Absent. Suitable habitat is absent, and these segments lie outside the current known range of the species. Segment 11: Possible in the Central Region only; Suitable habitat exists in Upper Tujunga Canyon and nearby creeks and drainages~~. Unlikely~~ and historical records exist. Absent in the Northern and Southern Regions; Suitable habitat is absent, and these segments lie outside the current known range of the species.
Mountain Yellow-legged Frog *Rana muscosa*	FE (San Gabriel, San Bernardino, and San Jacinto populations only), CSSC	A highly aquatic frog; inhabits rocky, shaded streams in cool water; also occurs in mountain lakes. Prefers deeper pools. Historically, elevation in southern California ranged from 1,200 feet to 7,500 feet.	Segment 4: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 5: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 6: Possible. Recent range includes the upper reaches of Devil's Canyon, Little Rock Creek, South Fork of Big Rock Creek, Upper Tujunga Canyon, east fork of Alder Creek, Bear and ~~potentially~~Vincent Gulches, and numerous other nearby canyons~~.~~ hold historical records. Nearest recent record from ~~1999, 0.2 mi upstream from mouth of Bear Gulch approximately 20~~2002, in Devil's Canyon about 6 miles east of Segment 6. Unlikely in the Northern Region~~; Not likely to occur~~ due to lack of habitat and ~~segment~~ location is outside of the known distribution for this species. Segment 7: Unlikely. No suitable habitat is present. This area was historically known to have mountain yellow-legged frogs near the Forest Boundary. Segment 8: ~~Unlikely.~~Absent. No suitable habitat is present, and this segment is outside the known range of the species. Segment 10: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known range for this species. Segment 11: Possible. Although suitable habitat exists in Upper Big Tujunga Canyon and Alder Creek and historical records exist in many nearby canyons, no recent records exist nearby. Species is thought to have been extirpated from >99% or former

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			range in Southern California. Unlikely in the Northern and Southern Regions~~; Not likely to occur~~ due to lack of habitat and locations are outside the known range for this species.
Western Spadefoot *Spea hammondii*	CSSC	Grasslands and occasionally hardwood woodlands, washes, floodplains, and playas. Primarily occurs in lowlands, but also in foothills and mountains. Vernal pools or similar ephemeral pools required for breeding.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat for this species, outside of the known range. Segment 5: ~~Unlikely~~Absent. No suitable habitat for this species, outside of the known range. Segment 6: Possible in the Central Region; Could occur in suitable habitats below 4,000 feet if suitable breeding habitat is present nearby. Unlikely in the Northern Region; No suitable habitat for this species. Segment 7: Possible: May occur across a variety of undeveloped habitats where suitable breeding pools are present. Segment 8: Present. Observed in Puente Hills Landfill Native Habitat Preservation Authority lands during surveys conducted in 2005. High quality habitat is present in the Puente Hills and Chino Hills areas. May also occur across a variety of undeveloped habitats where suitable breeding pools are present. Segment 10: ~~Unlikely.~~Absent. No suitable habitat for this species, outside of the known range. Segment 11: Possible in the Central and Southern Regions; Could occur in suitable habitats below 4,000 feet if suitable breeding habitat is present nearby. Unlikely in the Northern Region; No suitable habitat for this species.
Coast Range Newt *Taricha torosa torosa*	CSSC	Inhabits moist uplands surrounding ponds, reservoirs, or slow-moving streams in which they breed.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 5: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 6: Present: Occurrence record from the San Gabriel River including the West Fork. Observed in drainages crossing the Monrovia Truck Trail access road in May 2008. May occur in and along other drainages, with the greatest likelihood of occurrence in cismontane slopes. Unlikely in the Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species. Segment 7: Unlikely. Marginal habitat is present at Rio Hondo and the San Gabriel River. Habitat along these rivers is highly disturbed and degraded. Segment 8: Possible. Suitable habitat is present in Brea Canyon and Tonner Creek. Habitat along these streams is moderately disturbed and degraded. Soquel Creek in Chino Hills State Park also contains possible suitable habitat for this species. Segment 10: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 11: Present in the Central Region; May occur in and along several drainages, with the greatest likelihood of occurrence in cismontane slopes. Possible in the Southern Region; Suitable habitat is present in Eaton Wash. Unlikely in the Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species.
San Gabriel Mountains Slender Salamander *Batrachoseps gabrieli*	FSS	Known only from 13 sites within forest communities of the San Gabriel Mtns. Primarily inhabits talus and large rocks, logs, and bark during periods of surface activity.	Segment 4: ~~Unlikely.~~Absent. Outside of the known range, no suitable habitat. Segment 5: Unlikely. Outside of the known range, marginal habitat present. Segment 10: ~~Unlikely~~Absent. Outside of the known range, no suitable habitat. Segment 6: Possible in the Central Region only; Suitable habitat is present at numerous locations. Unlikely in the Northern Region; Outside of the known range. Segment 7: Unlikely. Outside of the known range, marginal habitat present. Segment 8: Unlikely. Outside of the known range. Segment 11: Possible. Suitable habitat is present at numerous locations. Unlikely in the Northern and Southern Regions; Outside of the known range.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Tehachapi slender salamander *Batrachoseps stebbinsi*	FSS, ST	Inhabits moist canyons and ravines in oak and mixed woodlands. Found under rocks, logs, bark, and other debris in moist areas, especially in areas with much leaf-litter, often near talus slopes.	Segment 4: ~~Unlikely.~~Absent. Known from the Tehachapi Mountains. Area is outside of the known range for this species. Suitable habitat not available. Segment 5: ~~Unlikely.~~Absent. Known from the Tehachapi Mountains. Area is outside of the known range for this species. Suitable habitat not available. Segment 6: Unlikely. Known from the Tehachapi Mountains. Area is outside of the known range for this species, marginal habitat present. Segment 7: ~~Unlikely~~Absent. Known from the Tehachapi Mountains. Area is outside of the known range for this species no suitable habitat. Segment 8: ~~Unlikely.~~Absent. Known from the Tehachapi Mountains. Area is outside of the known range for this species. Suitable habitat not available. Segment 10: ~~Unlikely.~~Absent. Known from the Tehachapi Mountains. Area is outside of the known range for this species, no suitable habitat. Segment 11: Unlikely. Known from the Tehachapi Mountains. Area is outside of the known range for this species~~.~~, marginal habitat present.
Yellow-blotched Salamander *Ensatina eschscholtzii croceater*	FSS, CSSC	Litter and debris of oak woodland, pine dominated open woodland, and fir dominated open forest.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat exists, outside of the known range. Segment 5: ~~Unlikely~~Absent. No suitable habitat exists, outside of the known range. Segment 6: ~~Possible~~ Absent. Although suitable habitat exists in some areas, this segment is well outside of the known range of this subspecies. ~~in the Central Region only; This species has been found at several locations throughout the ANF and suitable habitat is present at numerous locations. Unlikely in the Northern Region; No suitable habitat exists.~~ Segment 7: ~~Unlikely.~~Absent. No suitable habitat exists, outside of the known range. Segment 8: ~~Unlikely. Outside~~Absent. No suitable habitat exists, outside of the known range ~~of this subspecies~~. Segment 10: ~~Unlikely~~Absent. No suitable habitat exists, outside of the known range. Segment 11: ~~Possible~~ Absent. Although suitable habitat exists in some areas, this segment is well outside of the known range of this subspecies. ~~in the Central Region only; Has been found at several locations throughout the ANF and suitable habitat is present at numerous locations. Unlikely in the Northern and Southern Regions; No suitable habitat exists.~~
REPTILES			
California Horned Lizard *Phrynosoma coronatum frontale*	CSSC	Loose sandy loam and alkaline soils in habitats including chaparral, grasslands, saltbush scrub, coastal scrub, and clearings in riparian woodlands.	Segment 4: Possible. May occur across a variety of undeveloped habitats within southern portions. This subspecies considered unlikely in northern half of the segment. Segment 5: Likely. Known to occur near this segment. May occur across a variety of undeveloped habitats within southern and central portions of this segment. Segment 6: Likely in the Northern Region only; k~~K~~nown to occur near this segment. Possible in the Central Region. May occur across a variety of undeveloped habitats within southern and central portions of this segment. Segment 7: Unlikely. Although suitable habitat is present, this segment is likely outside the range of this subspecies. Segment 8: Unlikely. Although suitable habitat is present, this segment is likely outside the range of this subspecies. Segment 10: Unlikely. Although suitable habitat is present, this segment is likely outside the range of this subspecies. Segment 11: Likely in the Northern Region only; Known to occur near this segment. May occur across a variety of undeveloped habitats within southern and central portions of this segment. ~~Unlikely~~ Possible in the Central and Southern Regions; ~~A~~although suitable habitat is present, this segment is likely outside the range of this subspecies.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
San Diego Horned Lizard *Phrynosoma coronatum blainvillii*	FSS, CSSC	A variety of habitats, including coastal sage scrub, chaparral, oak woodland, riparian woodland, and coniferous forest. Friable, sandy soils in areas with an abundant prey base of native ants are key habitat components.	Segment 4: Possible. May occur across a variety of undeveloped habitats within southern portions. This subspecies considered unlikely in northern half of the segment Segment 5: ~~Likely.~~Present. Known to occur near this segment. Detected by AMEC in 2008. May occur across a variety of undeveloped habitats within southern and central portions of this segment. Segment 6: Present. Known to occur at several locations in the ANF. May occur across a variety of habitats Segment 7: ~~Unlikely. This segment is likely outside the range of this subspecies.~~Likely. Documented nearby in the Puente-Chino Hills by LSA (2007) and USGS (2007). Segment 8: ~~Unlikely. This segment is likely outside~~Present. Observed in the ~~range of this subspecies~~Puente-Chino Hills (LSA, 2007; USGS, 2007). Also present within Chino Hills State Park near Alternative 4. Segment 10: ~~Unlikely. Although suitable~~Possible. Suitable habitat is present~~,~~ and this segment is likely ~~outside~~within the range of this subspecies. Segment 11: Present in the Central Region; Known to occur at several locations in the ANF. May occur across a variety of undeveloped habitats. Likely in the Northern Region; Known to occur near this segment. Unlikely in the Southern Region; This area is likely outside the range of this subspecies.
Mojave Fringe-Toed Lizard *Uma scoparia*	CSSC	Restricted to fine, loose, windblown sand of dunes, flats, riverbanks, and washes in areas with scant vegetation.	Segment 4: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 5: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 6: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 7: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 8: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 10: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 11: ~~Unlikely.~~Absent. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species.
Orange-throated Whiptail *Aspidoscelis hyperythrus beldingi*	CSSC	Chaparral, thornscrub, and frequently sandy areas of washes, streams, and terraces with streamside vegetation. Rocky slopes with patches of brush are often utilized.	Segment 4: Unlikely. Outside the species' known range, marginal habitat present. Segment 5: Unlikely. This segment lies outside the species' known range, marginal habitat present. Segment 6: Unlikely. This segment lies outside the species' known range, marginal habitat present. Segment 7: Unlikely. This segment lies well outside the species' known range, marginal habitat present. Segment 8: ~~Unlikely. Habitat highly degraded in the vicinity of the species' range.~~Likely. Suitable habitat occurs at several locations within Segment 8, including within the Puente and Chino Hills. Known from Chino Hills State Park near Alternative 4. Segment 10: Unlikely. This segment lies outside the species' known range, marginal habitat present. Segment 11: Unlikely. This segment lies well outside the species' known range~~.~~, marginal habitat present.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Silvery Legless Lizard *Anniella pulchra pulchra* California Legless Lizard *Anniella pulchra*	CSSC FSS	Sandy or loose loamy soils covered by sparse vegetation. Chaparral, pine-oak woodland, washes, streamside terraces utilized. Elevated soil moisture is required.	Segment 4: Unlikely. Does not occur due to lack of habitat. Segment 5: ~~Unlikely. Does not occur due to lack of habitat~~Present. Observed by AMEC at Amargosa Creek in 2008. Segment 6: Present. A legless lizard was detected in the West Fork San Gabriel River. Occurrence records are lacking. However, this species is highly cryptic and some suitable habitat is present. ~~A legless lizard was detected in the West Fork San Gabriel River.~~ Unlikely in the Northern Region; Does not occur due to lack of habitat. Segment 7: Likely. May occur across a variety of undeveloped habitats with friable soils and sparse vegetation. Segment 8: Likely. May occur across a variety of undeveloped habitats with friable soils and sparse vegetation. Particularly good habitat exists in the Puente Hills and Chino Hills areas. Segment 10: Unlikely. Does not occur due to lack of habitat. Segment 11: Likely in the Southern Region; May occur across a variety of undeveloped habitats with friable soils and sparse vegetation. Possible in the Central Region; Occurrence records are lacking. However, this species is highly cryptic, and some suitable habitat is present. Unlikely in the Northern Region due to lack of habitat.
~~California Red-sided~~South Coast Garter Snake *Thamnophis sirtalis ~~infernalis~~ssp.*	CSSC	Marsh habitats of perennial or nearly perennial water and the surrounding uplands.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 5: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 6: ~~Unlikely~~Possible. Although suitable habitat is present along several drainages, this taxon is very uncommon or extirpated in Los Angeles Co. Segment 7: Unlikely. Although suitable habitat is present along several drainages, this species is uncommon in Los Angeles Co. Segment 8: Unlikely. Although suitable habitat is present along several drainages, this species is uncommon in Los Angeles Co. Segment 10: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 11: ~~Unlikely~~Possible. Although suitable habitat is present along several drainages, this taxon is very uncommon or extirpated in Los Angeles Co.
Two-striped Garter Snake *Thamnophis hammondii*	FSS, CSSC	In or near permanent freshwater, more commonly in pools of streams with a rocky substrate, bordered by riparian vegetation.	Segment 4: Unlikely. Suitable habitat absent. Segment 5: Likely. Recorded near the Amargosa Creek crossing and could also occur in Anaverde Creek. Segment 6: Present. Occurrence record from the San Gabriel River, and suitable habitat is present in and along several other drainages. Found in Upper Big Tujunga and Alder Creek. Unlikely in the Northern Region; Suitable habitat absent. Segment 7: Possible. Suitable habitat present in Rio Hondo and the San Gabriel River. Habitat along these rivers within Segment 7 is highly disturbed and degraded. Segment 8: Likely. Suitable habitat present in Tonner Creek. Marginal habitat present at Brea Canyon. Possible suitable habitat present in Soquel Creek within Chino Hills State Park. Segment 10: Unlikely. Suitable habitat absent. Segment 11: Present in the Central Region; This species is found in Upper Big Tujunga. Likely in the Southern Region; Suitable habitat present in Eaton Wash. Unlikely in the Northern Region; Suitable habitat absent.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Coast Patch-nosed Snake *Salvadora hexalepis virgultea*	CSSC	Inhabits chaparral or other habitats relatively sparse, brushy or shrubby vegetation.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 5: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 6: Likely in the Central Region only; Suitable habitat for this species is widespread throughout undeveloped areas. Unlikely in the Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species. Segment 7: Likely. Suitable habitat for this species is widespread throughout undeveloped areas Segment 8: Likely. Suitable habitat for this species is widespread throughout undeveloped areas. Segment 10: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 11: Likely in the Central and Southern Regions only; Suitable habitat for this species is widespread throughout undeveloped areas. Unlikely in the Northern region; No suitable habitat exists and this segment lies outside the known range of the species.
Coastal Rosy Boa *Charina trivirgata roseofusca*	FSS	Coastal sage scrub, chaparral, or mixed habitats. Also found in riparian areas and in oak woodlands, where they interdigitate with coastal sage scrub or chaparral. Common in desert scrub areas. Rock outcrops are a common but not requisite habitat feature.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 5: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 6: Likely: Suitable habitat for this species is widespread throughout undeveloped areas. Unlikely in the Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species. Segment 7: Likely: Suitable habitat for this species is widespread throughout undeveloped areas of this segment. Segment 8: Likely: Suitable habitat for this species is widespread throughout undeveloped areas of this segment. Particularly good habitat exists in the Puente Hills and Chino Hills areas. Segment 10: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 11: Likely in the Central and Southern Regions; Suitable habitat for this species is widespread throughout undeveloped areas of this segment. Unlikely in the Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species.
Southern Rubber Boa *Charina bottae umbratica*	ST, FSS	Occurs in conifer forests near streams and meadows. Known to occur in the Transverse Range, San Bernardino Mtns., and thought to be extirpated from the San Gabriel Mtns.	Segment 4: Unlikely. Suitable habitat is not present. Segment 5: Unlikely. Suitable habitat is not present. Segment 6: Unlikely. Thought to be extirpated from the San Gabriel Mountains, but focused surveys have not been conducted. Also unlikely in the Northern Region; Suitable habitat is not present. Segment 7: Unlikely. Suitable habitat is not present. Segment 8: Unlikely. Suitable habitat is not present. Segment 10: Unlikely. Suitable habitat is not present. Segment 11: Unlikely. Thought to be extirpated from the San Gabriel Mountains, but focused surveys have not been conducted. Also unlikely in Northern and Southern Regions; Suitable habitat is not present.
Northern Red Diamond Rattlesnake *Crotalus ruber ruber*	CSSC	Inhabits chaparral, coastal sage scrub, desert scrub habitats, and other brushy habitats. Usually found in association with large rocks or	Segment 4: ~~Unlikely~~Absent. This segment lies well outside the species' known range. Segment 5: Absent~~Unlikely~~. This segment lies well outside the species' known range. Segment 6: Absent~~Unlikely~~. This segment lies well outside the species' known range. Segment 7: Absent~~Unlikely~~. This segment lies well outside the species' known range. Segment 8: Present. Observed in Puente/Chino Hills during surveys conducted in 2002 and 2005. However, unlikely in other portions of this segment because they are outside the species' known range.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
		boulders.	Segment 10: Absent~~Unlikely~~. This segment lies well outside the species' known range. Segment 11: Absent~~Unlikely~~. This segment lies well outside the species' known range.
San Bernardino Ringneck Snake *Diadophis punctatus modestus*	FSS	Moist habitats in forests, woodlands, grasslands, and chaparral. Usually found under cover objects such as rocks, logs, or bark.	Segment 4: ~~Unlikely.~~Absent. This segment lies well outside the species' known range, no suitable habitat. Segment 5: Unlikely. This segment lies well outside the species' known range, marginal habitat present. Segment 6: Likely. Suitable habitat for this species is widespread throughout undeveloped areas. Unlikely in the Northern Region; This segment lies well outside the species' known range. Segment 7: Possible. Potential habitat is present within some undeveloped areas. Segment 8: Present. Observed in the Whittier Hills in the Puente Hills Landfill Native Habitat Preservation Authority lands during surveys conducted in 2002. Particularly good habitat observed in the Puente Hills and Chino Hills areas Segment 10: ~~Unlikely.~~Absent. This segment lies well outside the species' known range, no suitable habitat. Segment 11: Present. Occurs in the Arroyo Seco. Potential habitat is present within some undeveloped areas. Likely in the Central Region; Suitable habitat for this species is widespread throughout undeveloped areas. Unlikely in the Northern Region; This segment lies well outside the species' known range.
San Bernardino Mountain Kingsnake *Lampropeltis zonata parvirubra*	FSS, CSSC	Inhabits canyons with low to moderate tree canopy, with rock outcrops or talus, frequently in association with bigcone spruce and chaparral vegetation at lower elevations.	Segment 4: ~~Unlikely.~~Absent. This segment lies well outside the species' known range, no suitable habitat. Segment 5: ~~Unlikely~~Absent. This segment lies well outside the species' known range, no suitable habitat. Segment 6: Present. Has been found in the West Fork San Gabriel River. Species was also detected in Upper Big Tujunga Canyon (AMEC, 2008). Unlikely in the Northern Region; This area lies well outside the species' known range. Segment 7: ~~Likely~~Possible. Limited potential habitat near the ANF boundary. Segment 8: ~~Unlikely~~Absent. This segment lies well outside the species' known range, no suitable habitat. Segment 10: ~~Unlikely~~Absent. This segment lies well outside the species' known range, no suitable habitat. Segment 11: Present in the Central Region; Has been found in the Arroyo Seco. Likely in the Southern Region; Found within the San Gabriel Mountains areas. Unlikely in the Northern Region; This area lies well outside the species' known range.
San Diego Mountain Kingsnake *Lamporpeltis zonata pulchra*	FSS, CSSC	A variety of habitats, including coniferous forest, oak-pine and riparian woodland, chaparral, manzanita, and coastal sage scrub. Often utilizes well-lit wooded areas with rotting logs and/or talus and rock outcrops.	Segment 4: ~~Unlikely~~Absent. This segment is likely outside the range of this species, no suitable habitat. Segment 5: ~~Unlikely~~Absent. This segment is likely outside the range of this species, no suitable habitat. Segment 6: ~~Unlikely~~Absent. This segment is likely outside the range of this species. Segment 7: ~~Possible~~Unlikely. Limited potential of habitat near Puente Hills. Segment 8: ~~Likely. Known in~~Unlikely. Marginal habitat exists. The Chino Hills State Park~~.~~ General Plan (1999) states it is unlikely Segment 10: ~~Unlikely~~Absent. This segment is likely outside the range of this species, no suitable habitat. Segment 11: ~~Possible~~Unlikely in the Southern Region; Limited potential of habitat near Puente Hills. Unlikely in the Northern and Central Regions; Outside of the known range for this species.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Southwestern Pond Turtle *Emys marmorata pallida*	FSS, CSSC	In and around a wide variety of permanent or nearly permanent aquatic habitats.	Segment 4: ~~Unlikely.~~Absent. Suitable habitat absent, outside of the known range. Segment 5: Likely. Suitable habitat present in the Amargosa Creek system. Species is known to occur near or within this drainage and has been found upstream from the Project area. Segment 6: Present in the Central Region; Has been found in Upper Big Tujunga Creek and the West Fork of San Gabriel River. Unlikely In the Northern Region; Suitable habitat absent. Segment 7: Present. Observed at the San Gabriel River during reconnaissance surveys conducted in 2007. Marginal habitat also present at Rio Hondo. Segment 8: Present. Observed at Brea Canyon during reconnaissance surveys conducted in 2007. Marginal habitat also present at Tonner Creek. Segment 10: ~~Unlikely.~~Absent. Suitable habitat absent, outside of the known range. Segment 11: Likely in the ~~Ventral~~Central Region; Suitable habitat is present in several drainages, and several occurrences are recorded from the Project vicinity. Possible in the Southern Region; Suitable habitat present at Eaton Wash. Unlikely In the Northern Region; Suitable habitat absent.
Desert Tortoise *Gopherus agassizii*	FT, ST	Inhabits semi-arid grasslands, gravelly desert washes, canyon bottoms and rocky hillsides. Associated plant species includes creosote bush, Joshua tree, cheese bush, saltbush, grasses, and cacti.	Segment 4: ~~Unlikely. Although suitable~~Possible. Suitable habitat exists within the creosote scrub and Joshua tree woodland habitats of this segment~~, the~~. The species is may be present in low numbers (USFWS) although the species was not detected during focused surveys conducted in June 2006 and reconnaissance surveys in 2007. This segment ~~lies outside~~falls within the ~~current known range~~clearance survey area of the ~~species~~West Mohave Plan. Segment 5: Unlikely. Although limited suitable habitat exists within the creosote scrub and Joshua tree woodland habitats, this segment lies outside the current known range of the species. Segment 6: ~~Unlikely.~~Absent. Suitable habitat is absent, and these segments lie outside the current known range of the species. Segment 7: ~~Unlikely.~~Absent. Suitable habitat is absent, and these segments lie outside the current known range of the species. Segment 8: ~~Unlikely.~~Absent. Suitable habitat is absent, and these segments lie outside the current known range of the species. Segment 10: ~~Unlikely. Although suitable~~Possible. Suitable habitat exists within the creosote scrub and Joshua tree woodland habitats~~, this~~. Three individuals were reported within a mile of the ~~segment, which ~~lies outside~~falls within the ~~current known range~~clearance survey area of the ~~species~~West Mohave Plan. Segment 11: ~~Unlikely.~~Absent. Suitable habitat is absent, and these segments lie outside the current known range of the species.
MAMMALS			
San Gabriel Mountains Bighorn Sheep *Ovis Canadensis nelson*	FSS	Inhabits open, rocky, steep areas with access to water and herbaceous vegetation. Populations currently managed in the Sheep management area of the San Gabriel Mtns.	Segment 4: ~~Unlikely.~~Absent. Outside of known range, no suitable habitat. Segment 5: ~~Unlikely~~Absent. Outside of known range, no suitable habitat. Segment 6: Possible. Suitable habitat occurs at several locations. A single sighting has been reported from Santa Anita Canyon. Known to occur from San Gabriel Wilderness area south to West Fork San Gabriel River. Unlikely in the Northern Region; Outside of known range. Segment 7: Possible. Suitable habitat occurs at several locations in the northernmost part of this segment. A single sighting has been reported from Santa Anita Canyon. Known to occur from San Gabriel Wilderness area south to West Fork San Gabriel River. Segment 8: ~~Unlikely.~~Absent. Outside of known range, no suitable habitat. Segment 10: ~~Unlikely~~Absent. Outside of known range, no suitable habitat. Segment 11: Unlikely. Outside of known range.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
American Badger *Taxidea taxus*	CSSC	Occurs in open habitats, including grasslands, desert scrub, agricultural fields and pastures, and sparse coastal scrub.	Segment 4: Likely. Suitable grassland, desert scrub, and agricultural field habitat present. Segment 5: Likely. Suitable grassland, desert scrub, and agricultural field habitat present. Segment 6: Present. There is limited suitable grassland habitat present on the northern foothills of the San Gabriel Mountains. Habitat is rugged, but species may occur in some grassland valleys. Badger dens have been documented along the Pacific Crest Trail near and to the west of Arrastre Canyon in the Cental Region. Segment 7: Unlikely. Marginal habitat observed at the base of the southern slope of the San Gabriel Mountains. Segment 8: Present. Recorded in the Puente Hills Landfill Native Habitat Preservation Authority lands in 2006. Suitable grassland habitat is present in the Puente and Chino Hills. Segment 10: Likely. Suitable grassland, desert scrub, and agricultural field habitat present. Segment 11: Possible. Possible in the northern and Central Regions. There is limited suitable grassland habitat is present on the northern foothills of the San Gabriel Mountains Habitat is rugged, but species may occur in some grassland valleys. Unlikely in the south; habitat is marginal at the base of the southern slope of the San Gabriel Mountains.
Ringtail Cat *Bassariscus astutus*	CDFG FP	Occurs primarily in or adjacent to riparian habitats, but also known from forest and shrub habitats at low to mid elevations.	Segment 4: Unlikely. Marginal habitat occurs along washes. Segment 5: Possible. Suitable habitat exists along Amargosa Creek. Segment 10: Possible. Suitable habitat exists along Oak Creek in the vicinity. Segment 6: Present. Suitable habitat exists along Big Tujunga Creek, West Fork San Gabriel River, and forested areas. Possible in the Northern Region; May occur within the proposed Project alignment within forest and shrub habitats at low to mid elevations. Segment 7: Possible. There is suitable habitat in San Gabriel foothills. Segment 8: Possible. Suitable habitat exists in the Puente and Chino Hills. Segment 11: ~~Likely~~Present in the Central Region; Suitable habitat exists along Big Tujunga Creek, West Fork of the San Gabriel River, and forested areas. Ringtails were observed immediately south and north of Mt. Gleason Rd. (AMEC, 2007). Possible in the ~~Central~~Northern and Southern Regions; There is suitable habitat in San Gabriel foothills. Also may occur within the proposed Project alignment within forest and shrub habitats at low to mid elevations.
San Diego Black-tailed Jackrabbit *Lepus californicus bennettii*	CSSC	Occurs in open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat is available for this species and area is outside of the known range for this species. Segment 5: ~~Unlikely.~~Absent. No suitable habitat is available for this species and area is outside of the known range for this species. Segment 6: Possible. There is limited suitable habitat at the base of the southern slope of the San Gabriel Mountains in coastal sage scrub. Unlikely in the Northern Region; No suitable habitat is available for this species and area is outside of the known range for this species. Segment 7: Likely. Suitable habitat in San Gabriel foothills. Segment 8: Likely. Suitable habitat in the Segment 8 alignment within the Puente and Chino Hills. Segment 10: ~~Unlikely.~~Absent. No suitable habitat is available for this species and area is outside of the known range for this species. Segment 11: Likely. Suitable habitat in the San Gabriel foothills. Possible in the Central Region; There is limited suitable habitat at the base of the southern slope of the San Gabriel Mountains in coastal sage scrub. Unlikely in the Northern Region; No suitable habitat is available for this species and area is outside of the known range for this species.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Mohave Ground Squirrel *Spermophilus mohavensis*	ST	Desert scrub habitats, usually on flat to gently sloping terrain with alluvial soils. Often co-occurs with antelope ground squirrel.	Segment 4: ~~Possible:~~Unlikely. Disturbed and degraded habitats occur throughout. Low-quality habitat observed. No individuals detected during reconnaissance surveys conducted in June 2006 or September 2007. Segment 5: Unlikely~~:~~. Disturbed habitats occur throughout, especially south of Holiday Avenue. No individuals detected during reconnaissance surveys conducted in June 2006 or September 2007. Segment 6: ~~Unlikely:~~Absent. Not likely to occur due to lack of habitat, outside of the known range. Segment 7: ~~Unlikely: Not likely to occur due to lack of habitat.~~ ~~Segment 8: Unlikely:~~Absent. Not likely to occur due to lack of habitat, outside of the known range. Segment 8: Absent. Not likely to occur due to lack of habitat, outside of the known range. Segment 10: Present~~:~~. Suitable habitat in Joshua tree woodland and creosote scrubland south of Oak Creek Drive; one individual was observed on the Project site during the reconnaissance-level surveys in June 2006. Segment 11: ~~Unlikely:~~Absent. Not likely to occur due to lack of habitat~~.~~, outside of the known range.
San Diego Desert Woodrat *Neotoma lepida intermedia*	CSSC	Occurs in a variety of shrub and desert habitats, primarily associated with rock outcroppings, boulders, cacti, or areas of dense undergrowth.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat is available for this species and area is outside of the known range for this species. Segment 5: ~~Unlikely.~~Absent. No suitable habitat is available for this species and area is outside of the known range for this species. Segment 10: ~~Unlikely.~~Absent. No suitable habitat is available for this species and area is outside of the known range for this species. Segment 6: Likely. Distributed in the coastal and mountainous areas of southwestern California. There is suitable habitat on the southern slope of the San Gabriel Mountains. Unlikely in the Northern Region; No suitable habitat is available for this species and area is outside of the known range for this species. Segment 7: ~~Likely.~~Present. Suitable habitat in San Gabriel foothills. Segment 8: Present. Recorded in Puente Hills Landfill Native Habitat Preservation Authority lands in 2003. There is suitable habitat in the Chino and Puente Hills. Segment 11: Likely in the Central and Southern Regions; This subspecies is distributed in the coastal and mountainous areas of southwestern California. Suitable habitat on the southern slope of the San Gabriel Mountains. Unlikely in the Northern Region; No suitable habitat is available for this species and area is outside of the known range for this species.
Stephen's Kangaroo Rat *Dipodomys stephensi*	FE, ST	Inhabits open grasslands and sparse coastal scrub with less than 50% cover, often with increased cover of forbs. Favors sites with gentle slopes and sandy to sandy loam soils with low clay and gravel content.	Segment 4: ~~Unlikely~~Absent. Outside of the geographic range for the species. Segment 5: Absent~~Unlikely~~. Outside of the geographic range for the species. Segment 6: Absent~~Unlikely~~. Outside of the geographic range for the species. Segment 7: Absent~~Unlikely~~. Outside of the geographic range for the species. Segment 8: Unlikely. Suitable habitat present but more than 5 miles outside the known range of this species. Nearest CNDDB records (3 total) are approximately 6 mi to the southeast of the Mira Loma Substation but 13 mi to nearest suitable habitat within Chino Hills. Segment 10: Absent~~Unlikely~~. Outside of the geographic range for the species. Segment 11: Absent~~Unlikely~~. Outside of the geographic range for the species.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Los Angeles Pocket Mouse *Perognathus longimembris brevinasus*	FSS, CSSC	Found in open ground of fine sandy composition; prefers fine, sandy soils and may utilize these soil types for burrowing; may be restricted to lower elevation grassland and coastal sage scrub.	Segment 4: ~~Unlikely.~~Absent. Suitable habitat is absent, outside of the known range. Segment 5: ~~Unlikely~~Absent. Suitable habitat is absent, outside of the known range. Segment 6: ~~Unlikely~~Absent. Suitable habitat is absent, outside of the known range. Segment 7: Unlikely. Marginal habitat in the Whittier Narrows Recreation Area, although this species is probably extirpated here. Segment 8: Unlikely. Marginal habitat in the Project area in the Puente and Chino Hills and along the San Gabriel River in the Whittier Narrows Recreation Area (probably extirpated in Whittier Narrows). Segment 10: ~~Unlikely.~~Absent. Suitable habitat is absent, outside of the known range. Segment 11: Unlikely. Marginal habitat the foothills of the San Gabriel Mountains, especially near Eaton Wash.
Northwestern San Diego Pocket Mouse *Chaetodipus fallax fallax*	CSSC	Inhabits coastal sage scrub and grasslands in moderately gravelly or rocky substrates and sandy-loam to loam soils.	Segment 4: ~~Unlikely.~~Absent. This segment lies well outside the species' known range, no suitable habitat. Segment 5: ~~Unlikely~~Absent. This segment lies well outside the species' known range, no suitable habitat. Segment 6: Possible in the Central Region only; Suitable habitat at the base of the southern slope of the San Gabriel Mountains in suitable coastal sage scrub habitat. Unlikely in the Northern Region; This area lies well outside the species' known range. Segment 7: Possible. Nearest record is approximately 11.5 miles to east, but marginally suitable habitat exists in the southern San Gabriel foothills. Segment 8: Possible. Suitable habitat within the Chino and Puente Hills. Segment 10: ~~Unlikely.~~Absent. This segment lies well outside the species' known range, no suitable habitat. Segment 11: Possible in the Central and Southern Regions; There is suitable habitat at the base of the southern slope of the San Gabriel Mountains in suitable coastal sage scrub habitat. Nearest records are from approximately 20 miles to southeast and east,. Unlikely in the Northern Region; This area lies well outside the species' known range.
Tehachapi Pocket Mouse *Perognathus alticolus inexpectatus*	FSS, CSSC	Occurs in a diversity of habitats, including Joshua tree woodland, pinyon-juniper woodland, oak savanna, and native and non-native grasslands. Burrows in friable, sandy soil.	Segment 4: Possible. Occurrence mostly near the southern end of this segment, where nearby CNDDB and museum records exist. Segment 5: Possible. Occurrence is most likely in the foothills and Tehachapi Mountain range near Cottonwood Creek, or near the southern end of Segment 4, where nearby CNDDB and museum records exist. Segment 6: Possible in the Northern Region; Occurrence is most likely in the foothills where these segments intersect with the existing Vincent Substation. Unlikely in the Central Region; Nearest records for this species occur 20 miles west of the Vincent Substation. Absent in the southern portion of this segment. Segment 7: ~~Unlikely~~Absent. Out of the known range for this species, conditions unsuitable for occurrence. Nearest records for this species occur 20 miles west of the Vincent Substation. Segment 8: ~~Unlikely.~~Absent. Out of the known range for this species, conditions unsuitable for occurrence. Nearest records for this species occur 20 miles west of the Vincent Substation. Segment 10: Possible. Occurrence is most likely in the foothills and Tehachapi Mountain range near Cottonwood Creek. Segment 11: Possible in the Northern Region; Occurrence is most likely in the foothills where these segments intersect with the existing Vincent Substation. Unlikely in the Central and Southern Regions; Nearest records for this species occur 20 miles west of the Vincent Substation. -Absent in the southern portion of this segment.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
White-eared Pocket Mouse *Perognathus alticolus alticolus*	FSS, CSSC	The white-eared pocket mouse is known only from a series of allopatric populations in arid yellow pine communities in the vicinity of Little Bear Valley and Strawberry Peak, San Bernardino Mtns., San Bernardino County. This species is likely to be found among Sagebrush and other shrubs in open, Ponderosa Pine forests and Pinyon-Juniper woodlands and in Sagebrush covered areas on the northern slopes and Big Bear Basin of the San Bernardino Mtns.	Segment 4: Unlikely. Known only from a small number of populations east of the Project area. Has not been recorded since 1934. Segment 5: Unlikely. Known only from a small number of populations east of the Project area. Has not been recorded since 1934. Segment 6: Unlikely. Known only from a small number of populations east of the Project area. Has not been recorded since 1934. Segment 7: Unlikely. Known only from a small number of populations in the western San Bernardino Mountains. Has not been recorded since 1934. Segment 8: Unlikely. Known only from a small number of populations in the western San Bernardino Mountains. Has not been recorded since 1934. Segment 10: Unlikely. Known only from a small number of populations east of the Project area. Has not been recorded since 1934. Segment 11: Unlikely. Known only from a small number of populations in the western San Bernardino Mountains. Has not been recorded since 1934.
Southern Grasshopper Mouse *Onychomys torridus ramona*	CSSC	Occurs primarily in grassland and sparse coastal sage scrub habitats.	Segment 4: Unlikely. Distributed in the coastal and mountainous areas of southwestern California. Marginal habitat exists near the Vincent Substation to the edge of the Mojave Desert. Segment 5: Unlikely. Distributed in the coastal and mountainous areas of southwestern California. Marginal habitat exists near the Vincent Substation. Segment 6: Possible. Limited suitable habitat at the base of the southern slope of the San Gabriel Mountains in coastal sage scrub. Unlikely in Northern Region; Marginal habitat exists near the Vincent Substation to the edge of the Mojave Desert. Segment 7: Possible. Limited suitable habitat in San Gabriel foothills. Segment 8: Possible. Suitable habitat in sections of the Chino and Puente Hills. Segment 10: Unlikely: Distributed in the coastal and mountainous areas of southwestern California. Marginal habitat exists near the Vincent Substation to the edge of the Mojave Desert. Segment 11: Possible in the Central and Southern regions; Limited suitable habitat at the base of the southern slope and foothills of the San Gabriel Mountains in coastal sage scrub. Unlikely in Northern Region; Marginal habitat exists near the Vincent Substation to the edge of the Mojave Desert.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Tulare Grasshopper Mouse *Onychomys torridus tularensis*	CSSC	Occurs in alkali desert scrub, succulent shrub, arid grassland, and desert wash or riparian communities.	Segment 4: Unlikely. Edge of the southern distribution of this subspecies occurs near the eastern end of this segment. Segment 5: Unlikely. Edge of the southern distribution of this subspecies occurs near the northern portion of Segment 10 or eastern end of Segment 4. Segment 6: Unlikely. Segment is outside of the known range of the species. Segment 7: Unlikely. Segment is outside of the known range of the species. Segment 8: Unlikely. Segment is outside of the known range of the species. Segment 10: Unlikely. Edge of the southern distribution of this subspecies occurs near the northern portion of Segment 10. Segment 11: Unlikely. Segment is outside of the known range of the species.
MAMMALS (BATS)			
Big Free-tailed Bat *Nyctinomops macrotis*	CSSC	Roosts primarily in caves, cliffs, rocky areas, and buildings, and occurs in primarily arid habitats.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies well outside the known range of the species. Segment 5: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies well outside the known range of the species. Segment 6: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies well outside the known range of the species. Segment 7: Unlikely. Some marginal roosting habitat was observed in the southern portion of this segment. May rarely migrate through this segment. Segment 8: Unlikely. Some marginal roosting habitat was observed in the southern portion of this segment. May rarely migrate through this segment. Segment 10: Unlikely. No suitable breeding habitat exists, and this segment lies well outside the known range of the species. Segment 11: Unlikely. Some marginal roosting habitat was observed in the southern portion of this segment. May rarely migrate through this segment.
California Leaf-nosed Bat *Macrotus californicus*	CSSC, FSS	The California leaf-nosed bat's preferred habitats are caves, mines, and rock shelters, mostly in Sonoran desert scrub. Roost sites are usually located near foraging areas.	Segment 4: Unlikely. Outside the known range for this species. Segment 5: Unlikely. Outside the known range for this species. Segment 6: Possible in the Central Region. Known from the ANF (pers. comm. P. Krueger, FS). Segment 7: Unlikely. Outside the known range for this species. Segment 8: Unlikely. Outside the known range for this species. Segment 10: Unlikely. Outside the known range for this species. Segment 11: Possible in the Central Region. Known from the ANF (pers. comm. P. Krueger, FS).
Pallid Bat *Antrozous pallidus*	FSS, CSSC	Primarily roosts in rock crevices, trees, bridges, and buildings, but also uses crevices and cavities in caves and mines. Found in many habitat types with open areas.	Segment 4: Unlikely. Marginal roosting habitat was observed at Cottonwood Creek near Aqueduct Road, approximately 1 mile from the Cottonwood Substation. Marginal roosting habitat was also observed in Joshua Tree woodland. This species is expected to forage over portions of this segment. Segment 5: Unlikely. Marginal roosting habitat was observed at Cottonwood Creek near Aqueduct Road, approximately 1 mile from the Cottonwood Substation. Marginal roosting habitat was also observed in Joshua Tree woodland. This species is expected to forage over portions of this segment Segment 6: Possible. Suitable roosting habitat was observed near Big Tujunga Creek within Upper Big Tujunga Canyon. Suitable habitat was also observed at abandoned mine near Milepost 8.7. Unlikely in the Northern Region; Primarily roosts in rock crevices, but also uses crevices and cavities in caves and mines. These areas may contain suitable roosting habitat. Segment 7: Unlikely. Marginal roosting habitat was observed in the foothills of the San Gabriel Mountains and at the San Gabriel River of the Whittier Narrows Recreation Area.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			Segment 8: Present. Recorded in Puente Hills in 2004 and in the Puente Hills Landfill Native Habitat Preservation Authority lands in 2006. Suitable roosting habitat was observed in the Chino and Puente Hills. Marginal habitat was observed along the San Gabriel River in the Whittier Narrows Recreation Area. This species is expected to forage over portions of this segment. Segment 10: Unlikely. Marginal roosting habitat was observed at Cottonwood Creek near Aqueduct Road, approximately 1 mile from the Cottonwood Substation. Marginal roosting habitat was also observed in Joshua Tree woodland. This species is expected to forage over portions of this segment Segment 11: Possible in the Central Region only; Low suitability roosting habitat was observed. However, five pallid bats were located in artificial "bat houses" under a bridge about 325 yards northwest of Alternative 6 helicopter site 3 near Aliso Canyon. Unlikely in the Northern and Southern Regions; Marginal roosting habitat was observed in the foothills of the San Gabriel Mountains south of the ANF
Pocketed Free-tailed Bat *Nyctinomops femorosaccus*	CSSC	Prefers rock crevices in cliffs as roosting sites. May use buildings for day roosts and also is known to use cavities in trees.	Segment 4: Unlikely: Typical roosting habitat was not observed. Segment 5: Unlikely: Typical roosting habitat was not observed. Segment 6: Unlikely: Typical roosting habitat was not observed. Segment 7: Unlikely: Typical roosting habitat was not observed. Segment 8: Present: Recorded in the Puente Hills Landfill Native Habitat Preservation Authority lands in 2005, 2006 with evidence of nearby roosting in Sycamore and Turnbull Canyons. Segment 10: Unlikely: Typical roosting habitat was not observed. Segment 11: Unlikely: Typical roosting habitat was not observed.
Spotted Bat *Euderma maculatum*	CSSC	Primarily roosts along cliffs in cracks, crevices, and caves in fractured rock.	Segment 4: Unlikely. Marginal roosting habitat was observed at Cottonwood Creek near Aqueduct Road, approximately 1 mile from the Cottonwood Substation. Foraging habitat was observed throughout this segment. Segment 5: Unlikely. Marginal roosting habitat was observed at Cottonwood Creek near Aqueduct Road, approximately 1 mile from the Cottonwood Substation. Foraging habitat was observed throughout this segment Segment 6: Possible. ~~Low suitability~~Marginal roosting habitat was observed in portions of Segment 6. Segment 7: Unlikely. Roosting habitat was not observed. Segment 8: Unlikely. Roosting habitat was not observed. Segment 10: Unlikely. Marginal roosting habitat was observed at Cottonwood Creek near Aqueduct Road, approximately 1 mile from the Cottonwood Substation. Foraging habitat was observed throughout this segment. Segment 11: Possible in the Central Region; Roosting habitat was observed along cliffs bordering Angeles Crest Highway above Brown Canyon. Unlikely in the Northern and Central Regions; ~~Low suitability~~Marginal roosting habitat was observed. Foraging habitat was observed throughout. However, roosting habitat was not observed in the Southern Region.
Townsend's Big-eared Bat *Corynorhinus townsendii*	FSS, CSSC	Primarily roosts in caves and abandoned mines, but may roost in buildings, bridges, rock crevices, and hollow trees in many habitat types.	Segment 4: Unlikely. Roosting habitat was not observed. Foraging habitat was observed throughout. Segment 5: Unlikely. Roosting habitat was not observed. Foraging habitat was observed throughout. Segment 6: Present. Potential low-suitability roosting habitat observed at abandoned mine south of Mill Creek Summit. Potential suitable habitat possible in same area within private mines. Recorded near the Alternative 6 helicopter site 7 at Barely Flats Road. Possible in the Northern Region; Roosting habitat may occur within these areas. Foraging habitat was observed throughout. Segment 7: Unlikely. Marginal roosting habitat observed south of the ANF. Segment 8: Unlikely. Marginal roosting habitat observed in the Chino and Puente Hills. Segment 10: Unlikely. Roosting habitat was not observed. Foraging habitat was observed throughout. Segment 11: Possible in the Central and Northern Regions; Low suitability roosting habitat was observed in portions of Segment

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			11. Roosting habitat may occur within some areas. Foraging habitat was observed in the Northern Region. Unlikely in the Southern Region; Marginal roosting habitat observed south of the ANF.
Western Mastiff Bat *Eumops perotis*	CSSC	Primarily roosts along cliffs in cracks, crevices, and caves in fractured rock.	Segment 4: Possible. Roosting habitat was not observed. Foraging habitat was observed throughout. Segment 5: Possible. Roosting habitat was not observed. Foraging habitat was observed throughout. Segment 6: Possible. Low suitability roosting habitat was observed. Foraging habitat was observed. Segment 7: Unlikely. Roosting habitat was not observed. Segment 8: Present. Recorded in Puente Hills Landfill Native Habitat Preservation Authority lands in 2005, 2006 but roosting habitat was not observed during previous surveys or reconnaissance-level surveys. Segment 10: Possible. Roosting habitat was not observed. Foraging habitat was observed Segment 11: Possible in the Northern and Central Regions; Roosting habitat was observed along cliffs bordering Angeles Crest Highway, above Brown Canyon. Foraging habitat was observed. Unlikely: Roosting habitat was not observed.
Western Red Bat *Lasiurus blossevillii*	CSSC, FSS	Primarily roosts in mature riparian forest but also found in upland forests, woodlands, and orchards.	Segment 4: Unlikely. Low-suitability roosting habitat was observed at Cottonwood Creek near Aqueduct Road, approximately 1 mile from the Cottonwood Substation. Segment 5: Unlikely. Low-suitability roosting habitat was observed at Cottonwood Creek near Aqueduct Road, approximately 1 mile from the Cottonwood Substation. Suitable roosting habitat also observed in Amargosa Creek Segment 6: Possible. Suitable roosting habitat was observed in Upper Big Tujunga Canyon. Additional potential habitat exists in riparian forest in the West Fork of the San Gabriel River drainage. Unlikely in the Northern Region; Not likely to occur due to lack of habitat. Segment 7: Unlikely. Marginal habitat is present along the San Gabriel River in the Whittier Narrows Recreation Area. Segment 8: Present. Recorded in the Puente Hills in 2005 and 2006 with evidence of nearby roosting. Suitable roosting habitat was observed in the Puente and Chino Hills and marginal habitat was observed along the San Gabriel River in the Whittier Narrows Recreation Area. Documented within the Puente Hills Landfill Native Habitat Preservation Authority lands in 2006. Segment 10: Unlikely. Low-suitability roosting habitat was observed at Cottonwood Creek near Aqueduct Road, approximately 1 mile from the Cottonwood Substation. Segment 11: Possible in the Central Region; Low suitability roosting habitat was observed. Unlikely in the Northern and Southern Regions; Marginal roosting habitat south of the ANF.
BIRDS			
California Condor *Gymnogyps californianus*	FE, SE	Requires vast expanses of open savannahs, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Nests in clefts of rocky walls of deep canyons. Can forage up to 100 miles from roost/nest.	Segment 4: Unlikely. No suitable breeding habitat exists, and this segment lies well outside the current known range of the species. Segment 5: Unlikely. No suitable breeding habitat exists, and this segment lies well outside the current known range of the species. Segment 6: ~~Possible. Nesting habitat is present in the ANF.~~ Present. Individuals have been recorded in the ANF in the recent past. Nesting habitat is present in the ANF. Unlikely in the Northern Region; No suitable breeding habitat exists and this segment lies outside the known range of the species. Segment 7: Likely. Condors are roosting within ANF and species has the potential to fly through this area. Segment 8: Unlikely. Segment is well outside of current known range. No nesting habitat and only marginal foraging habitat. There is a future potential for condors to fly over the area once their range is expanded over the life of the Project. Segment 10: Unlikely. No suitable breeding habitat exists, and this segment lies well outside the current known range of the species.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			Segment 11: Present in the Central and Southern Regions; Nesting habitat is present in the ANF. Individuals are roosting within 2 miles of the Project area. Historic nesting occurred within Eaton Canyon. Unlikely in the Northern Region; No suitable breeding habitat exists, and this segment lies well outside the known range of the species.
Bald Eagle *Haliaeetus leucocephalus*	FSS, SE	Nests on large trees in the vicinity of large lakes, reservoirs and rivers. Wintering birds are most often found near large concentrations of waterfowl or fish.	Segment 4: Unlikely. No suitable breeding habitat exists~~, and this segment lies well outside the known range of the species~~. Segment 5: Unlikely. No suitable breeding habitat exists~~, and this segment lies well outside the known range of the species~~. Segment 6: Possible in the Central Region only; Nesting habitat is absent. Foraging habitat at nearby Cogswell Reservoir is marginal. Confirmed wintering on ANF at Littlerock Reservoir (L. Welch, District Biologist; pers. comm.). Unlikely in the Northern Region; No suitable breeding habitat exists~~, and this segment lies well outside the known range of the species~~. Segment 7: Possible. Nesting habitat is absent. Foraging habitat in San Gabriel River at Santa Fe Dam and Whittier Narrows is marginal. Bald Eagles have been seen in flight above Santa Fe Dam. Segment 8: Present. Bald Eagles have been documented utilizing the Whittier Narrows area in winter 2008. Bald Eagles have been utilizing the Prado Basin, adjacent to the Chino Hills State Park Area, however suitable foraging habitat is absent in CHSP. The individuals observed were likely migrants or wintering as there is no suitable nesting habitat in or near the Project area. Segment 10: Unlikely. No suitable breeding habitat exists~~, and this segment lies well outside the known range of the species~~. Segment 11: Possible. Nesting habitat is absent. Foraging habitat at nearby Big Tujunga Reservoir is marginal. Confirmed wintering on ANF at Littlerock Reservoir (L. Welch, District Biologist; pers. comm.). Possible in the Southern Region; Bald Eagles have been detected flying along the urban area below the San Gabriel Mountains. These eagles are thought to be utilizing this area as a corridor to other areas. Foraging habitat is limited to Sawpit Reservoir, San Gabriel River, and Santa Fe Dam. Nesting habitat is limited. Unlikely in the Northern Region; No suitable breeding habitat exists.~~, and this segment lies well outside the known range of the species.~~
Golden Eagle *Aquila chrysaetos* (nesting and wintering)	CDFG WL, CDFG FP	Forages in open grasslands, desert scrub and agricultural fields. Nests on ledges on cliff faces, rock outcrops and occasionally in large trees.	Segment 4: Present: Observed during reconnaissance surveys conducted in 2007. Suitable foraging habitat present throughout Segment 5: Possible. Suitable foraging habitat is present throughout Segment 6: ~~Possible. Habitats open enough to provide foraging~~Likely. Suitable habitat ~~are absent from~~is present on the ANF. Segment 7: Unlikely. Foraging and nesting habitat is absent. Segment 8: Present. Species is known to have nested recently in the Puente/Chino Hills and observed in 2000. Foraging birds observed in the Puente Hills Landfill Native Habitat Preservation Authority lands. Segment 10: Present. Observed during reconnaissance surveys conducted in 2007. Suitable foraging habitat present throughout. Segment 11: Present in the Southern Region; This species is known to nest within the Arroyo Seco. Likely in ~~teh~~Central~~the~~ Central Region; ~~Habitats open enough to provide foraging~~suitable habitat ~~are absent from~~is present on the ANF. Golden Eagles have been known to nest in Arroyo Seco Canyon. Possible in the Northern Region; Suitable foraging habitat is present.
Cooper's Hawk *Accipiter cooperii* (nesting)	CDFG WL	Nests in woodlands, and sometimes, suburban settings if mature trees are present. Forages in many habitats in winter and migration.	Segment 4: Unlikely. No suitable nesting habitat exists~~,~~. Likely for wintering and ~~this segment lies outside the known range of the species~~migrant birds. Segment 5: ~~Unlikely. No suitable~~ Possible. Marginal nesting habitat exists~~,~~ at Amargosa Creek. Likely for wintering ~~and this segment lies outside the known range of the species.~~ ~~Segment 10: Unlikely. No suitable habitat exists, and this segment lies outside the known range of the species~~migrant birds. Segment 6: ~~Unlikely~~Likely. Suitable nesting and foraging habitat is ~~limited~~widespread and ~~highly fragmented~~fairly common in the ANF. ~~Not recorded as nesting in the San Gabriel Mountains. Unlikely in the Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species~~Expected to occur during migration and winter along this segment. Segment 7: ~~Likely.~~Present. Species observed in Whittier Narrows area (AMEC, 2007). Suitable nesting habitat in riparian at Whittier Narrows and in suburban areas with mature trees.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			Segment 8: Present. Suitable nesting habitat in the Puente/Chino Hills and marginal nesting habitat in suburban areas with mature trees. Observed in the Puente Hills Landfill Native Habitat Preservation Authority lands. Observed outside of nesting season during surveys conducted in 2000 and 2007. Segment 10: Unlikely. No suitable nesting habitat exists. Likely for wintering and migrant birds. Segment 11: ~~Likely.~~ Present. Observed outside of nesting season. Suitable nesting habitat in the San Gabriel Mountains and foothills and marginal nesting habitat in suburban areas with mature trees. ~~Observed outside of nesting season. Unlikely in the Central Region; Suitable nesting and foraging habitat is limited and highly fragmented in the ANF. Not recorded as nesting in the San Gabriel Mountains. Unlikely in the Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species.~~
Ferruginous Hawk *Buteo regalis* (wintering)	CDFG WL	Forages in grasslands and agricultural fields.	Segment 4: Possible. Known to occur in the Antelope Valley during winter. Segment 5: Possible. Known to occur in the Antelope Valley during winter. Segment 6: ~~Unlikely~~Absent. Not likely to occur due to lack of foraging habitat. Segment 7: ~~Unlikely~~Absent. Foraging habitat is absent. Segment 8: Present. Potential foraging habitat for wintering and migrating birds is present in agricultural habitats east of Chino. Segment 10: Possible. Known to occur in the Antelope Valley during winter. Segment 11: ~~Unlikely~~Absent. Not likely to occur due to lack of foraging habitat.
Sharp-shinned Hawk *Accipiter striatus* (nesting)	CDFG WL	Nests in conifer and riparian forests, preferably on north facing slopes near water. Forages in many habitats in winter and migration.	Segment 4: Unlikely. ~~Does not occur due to lack of~~ No suitable nesting habitat exists. Migrant and wintering birds likely. Segment 5: Unlikely. ~~Does not occur due to lack of habitat~~No suitable nesting habitat exists. Migrant and wintering birds likely. Segment 6: Possible in the Central Region; There is some suitable nesting habitat in the densely wooded habitats through the ANF~~. Unlikely in the Northern Region; Does not occur due to lack of habitat~~ but only one documented nesting in the San Gabriel Mts. (Icehouse Cyn, near Mt. Baldy). Nesting unlikely in the Northern Region. Migrant and wintering birds are likely throughout the segment. ~~Segment 7: Unlikely. Does not occur due to lack of habitat.~~ ~~Segment 8: Unlikely. Does not occur due to lack of habitat.~~ Segment 7: Present. Observed in the Puente Hills Landfill Native Habitat Preservation Authority lands (LSA, 2007). Segment 8: Present. Observed in the Puente Hills Landfill Native Habitat Preservation Authority lands (LSA, 2007). Segment 10: Unlikely. ~~Does not occur due to lack of habitat~~No suitable nesting habitat exists. Migrant and wintering birds likely. Segment 11: Possible in the Central Region; There is some suitable nesting habitat in the densely wooded habitats through the ANF~~. Unlikely~~ but only one documented nesting in the San Gabriel Mountains (Icehouse Cyn, near Mt. Baldy). No nesting habitat in the Northern and Southern Regions. ~~; Does not occur due to lack of habitat.~~

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Swainson's Hawk *Buteo swainsoni*	ST, FSS	Nests in trees near foraging areas that include grasslands and agricultural croplands, especially alfalfa.	Segment 4: Likely. Known to nest adjacent to alfalfa fields within 5 miles. Suitable foraging habitat present within agricultural habitats. Segment 5: Unlikely. Few records of wintering or migrant. Segment 6: Unlikely. Alignment is outside breeding range. Possible in migration, though foraging habitat along alignment is marginal. There are few records of wintering or migrant individuals in the Northern Region. Segment 7: Unlikely. Segment is outside breeding range. Possible in migration, though foraging habitat is marginal. Segment 8: Present. Segment is outside breeding range. There are records of migrating birds. Migrants observed in the Puente Hills Landfill Native Habitat Preservation Authority lands. Segment 10: Present. Five active nests were detected within four miles~~Unlikely. Few records of wintering or migrant individuals.~~ Segment 11: Unlikely. Few records of wintering or migrant individuals in the Northern Region. The Southern and Central Regions are outside breeding range. Possible in migration, though foraging habitat is marginal.
Northern Goshawk *Accipiter gentilis*	FSS, CSSC (nesting)	Nests in old growth stands of conifer and conifer/hardwood forests.	Segment 4: Unlikely. Suitable habitat is absent Segment 5: Unlikely. Suitable habitat is absent Segment 6: ~~Unlikely.~~Possible. Suitable nesting and foraging habitat is limited and highly fragmented in the ANF. Not recorded as nesting in the San Gabriel Mountains, but surveys for this species have not been conducted. Segment 7: Unlikely. Suitable habitat is absent Segment 8: Unlikely. Suitable habitat is absent Segment 10: Unlikely. Suitable habitat is absent Segment 11: ~~Unlikely.~~Possible. Suitable nesting and foraging habitat is limited and highly fragmented in the ANF. Not recorded as nesting in the San Gabriel Mountains~~.~~, but surveys for this species have not been conducted.
Northern Harrier *Circus cyaneus*	CSSC (nesting only)	Breeds and forages in emergent wetlands and nearby open grasslands, fallow fields. Also forages in agricultural fields and desert scrub.	Segment 4: ~~Unlikely~~Absent. Suitable habitat is absent Segment 5: ~~Unlikely~~Absent. Suitable habitat is absent Segment 6: ~~Unlikely~~Absent. Suitable habitat is absent Segment 7: Unlikely: Nesting habitat is absent, and only marginal foraging habitat is present. Segment 8: Present: Observed in Puente Hills Landfill Native Habitat Preservation Authority lands during surveys conducted in 2000, 2002, and 2005. Observed in CHSP during surveys conducted for Alternative 4 in 2009. Segment 10: ~~Unlikely~~Absent. Suitable habitat is absent Segment 11: Unlikely. Nesting habitat is absent, and only marginal foraging habitat is present.
Osprey *Pandion haliaetus* (nesting)	CDFG WL	Breeds in variety of habitats with shallow water and large fish, including boreal forest ponds, desert salt-flat lagoons, temperate lakes, and tropical coasts. Winters along large bodies of water containing fish.	Segment 4: Unlikely. This is generally a coastal species but may be found near large bodies of water inland. Segment 5: Unlikely. This is generally a coastal species but may be found near large bodies of water inland. Segment 6: Present. This species has been detected in the East and West Fork of the San Gabriel River. This species has been observed above the settling ponds of the San Gabriel River near the San Gabriel Mountains Segment 7: Possible. Suitable habitat exists at the Whittier Narrows Recreation Area. Segment 8: Possible. Suitable habitat exists at the Whittier Narrows Recreation Area. Segment 10: Unlikely. This is generally a coastal species but may be found near large bodies of water inland. Segment 11: Possible. This species has been documented in the Central Region. Known from the ANF (pers. comm.. P. Krueger, FS)

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Merlin (*Falco columbarius*) (wintering)	CDFG WL	Boreal forests, coastal forests, prairies, and shrub-steppes.	Segment 4: Possible. This species is a winter migrant in California and suitable habitat is present within the Project area. Segment 5: Possible. This species is a winter migrant in California and suitable habitat is present within the Project area. Segment 6: Possible. This species is a winter migrant in California and suitable habitat is present within the Project area. Segment 7: Possible. This species is a winter migrant in California and suitable habitat is present within the Project area. Segment 8: Likely. Observed in the Puente Hills Landfill Native Habitat Preservation Authority lands. This species is a winter migrant in California and suitable habitat is present within the Project area. Segment 10: Possible. This species is a winter migrant in California and suitable habitat is present within the Project area. Segment 11: Possible. This species is a winter migrant in California and suitable habitat is present within the Project area.
Peregrine Falcon *Falco peregrines* (nesting)	FD, SCD, CDFG FP,	Nests on cliff ledges, and forages where there are large concentrations of birds.	Segment 4: Unlikely. A few migrate through the Antelope Valley, but are more likely to occur at the freshwater marshes and sewage ponds. Segment 5: Unlikely. A few migrate through the Antelope Valley, but are more likely to occur at the freshwater marshes and sewage ponds. Segment 6: Present. Migrants are widespread. Marginal nesting habitat occurs in the vicinity of Big Tujunga Canyon. Unlikely in the Northern Region; A few migrate through the Antelope Valley, but are more likely to occur at the freshwater marshes and sewage ponds. Peregrine falcons have been seen in the Arroyo Seco near Hahamonga Park. Segment 7: Possible. Migrants are widespread. Nesting habitat and habitats that would attract Peregrine Falcons for prolonged periods are absent. Segment 8: Present. Recorded near Mira Loma substation and observed in 2005 near Harbor Blvd. in the Puente Hills Landfill Native Habitat Preservation Authority lands. Nesting habitat is absent. Dispersing birds could be attracted to shorebirds foraging in dairy ponds east of Chino Segment 10: Unlikely. A few migrate through the Antelope Valley, but are more likely to occur at the freshwater marshes and sewage ponds Segment 11: Present. Migrants are widespread. Peregrine falcons are present in the Arroyo Seco. Nesting occurs in Upper Big Tujunga near the confluence of Falls Creek. Unlikely in the Northern Region; A few migrate through the Antelope Valley, but are more likely to occur at the freshwater marshes and sewage ponds.
Prairie Falcon *Falco mexicanus* (nesting)	CDFG WL	Forages in desert scrub, grasslands, agricultural fields and Joshua tree woodland. Nests on cliffs or escarpments, usually overlooking dry, open terrain or uplands.	Segment 4: Present. No suitable nesting substrates or nests found within 0.5 miles. Foraging habitat is present throughout. Observed during habitat surveys in 2007. Segment 5: Possible. No suitable nesting substrates or nests found within 0.5 miles. Foraging habitat is present throughout. Segment 6: Possible in the Northern Region only; No suitable nesting substrates or nests were found within 0.5 miles. Foraging habitat is present throughout. ~~Unlikely~~ Absent in the ~~Southern~~ Central Region; suitable habitat is not available. Segment 7: Unlikely. Suitable habitat is not available. Segment 8: ~~Unlikely. Suitable habitat is not available.~~Present. This species has been observed foraging in the Puente/Chino Hills and Chino Hills State Park (CHSP, 1999; Scott and Cooper, 1999). Segment 10: Possible. No suitable nesting substrates or nests found within 0.5 miles. Foraging habitat is present throughout. Segment 11: Possible in the Northern Region only; No suitable nesting substrates or nests were found within 0.5 miles. Foraging habitat is present throughout. ~~Unlikely~~ Absent in the Southern and Central Regions; suitable habitat is not available.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
White-tailed Kite *Elanus leucurus* (nesting)	CDFG FP	Forages in open grasslands, desert scrub and agricultural fields. Nests on trees and large shrubs.	Segment 4: Possible. Rare and local breeder in Antelope Valley, with no confirmed breeding in the vicinity. More common during the winter, and likely to forage in this segment. Segment 5: Possible. Rare and local breeder in Antelope Valley, with no confirmed breeding in the vicinity. More common during the winter, and likely to forage in this segment. Segment 6: Unlikely. Habitats open enough to provide foraging habitat are absent from the alignment through the ANF. However foraging habitat is marginally suitable in the Northern Region. Segment 7: Possible. Rare and local breeder, with no confirmed breeding in this segment. More common during the winter, and likely to forage in this segment. Segment 8: Present. Rare and local breeder, with no confirmed breeding in this segment. Observed in Puente Hills Landfill Native Habitat Preservation Authority lands in 2000, 2002, and 2005. Segment 10: Possible. Rare and local breeder in Antelope Valley, with no confirmed breeding in the vicinity. More common during the winter, and likely to forage in this segment. Segment 11: Possible. Rare and local breeder, with no confirmed breeding in this segment. More common during the winter, and likely to forage in this area. Unlikely in the Central and Northern Regions; Habitats open enough to provide foraging habitat are absent from the alignment through the ANF. However, foraging habitat is marginally suitable in the Northern Region.
~~Burrowing Owl *Athene cunicularia*~~	~~CSSC~~	~~Found in open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals, such as ground squirrels.~~	~~Segment 4: Possible. Suitable foraging habitat and CA ground squirrel burrows that could provide breeding habitat are present~~ ~~Segment 5: Unlikely. Suitable foraging habitat is present, though California ground squirrel burrows or other burrows that could provide breeding habitat were not observed.~~ ~~Segment 6: Likely in the Central Region; Observed within the ANF boundary in a private in-holding near Kentucky Springs. Foraging and nesting habitat is absent within the ANF. Possible in the Northern Region; Suitable foraging habitat and California ground squirrel burrows that could provide breeding habitat are present.~~ ~~Segment 7: Possible: some suitable habitat in open areas along the San Gabriel River where burrows are present in the upper banks of waterways in open habitats.~~ ~~Segment 8: Present: Observed in agricultural habitats east of Chino during reconnaissance surveys conducted in 2007. Also recorded at the Mira Loma substation, Sycamore Canyon, and Arroyo San Miguel in 1999 and 2006.~~ ~~Segment 10: Present. Suitable foraging habitat and CA ground squirrel burrows that could provide breeding habitat are present.~~ ~~Segment 11: Possible in the Northern Region only; Suitable foraging habitat and California ground squirrel burrows that could provide breeding habitat are present. Unlikely in the Central and Southern Regions; Foraging and nesting habitat is absent.~~
California Spotted Owl *Strix occidentalis occidentalis*	FSS, CSSC	In southern California occupies montane hardwood and montane hardwood/conifer forests with dense, multi-layered canopies.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 5: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 6: Present in Central Region only; Detected in Canyon Oak Forest and Bigcone Douglas Fir-Canyon Oak Forest habitats along the alignment. Unlikely in Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species. Segment 7: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 8: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 10: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 11: Present in Central Region only; Detected in Canyon Oak Forest and Bigcone Douglas Fir-Canyon Oak Forest habitats along the alignment. Unlikely in Northern and Southern Regions; No suitable habitat exists, and this segment lies outside the known range of the species.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Long-eared Owl *Asio otus* (nesting)	CSSC	Breeds in thickly vegetated desert washes and oases, montane coniferous forests and in riparian and pinyon-juniper woodlands. Requires adjacent open habitats for foraging.	Segment 4: Possible. Observed roosting in the tamarisk in the vicinity. Could forage in open habitats. Segment 5: Possible. Observed roosting in the vicinity. Could forage in open habitats. Segment 6: Possible. Observed roosting in the vicinity. Could forage in open habitats Unlikely in the Central Region; Habitats open enough to provide foraging habitat are absent from the ANF. Segment 7: Unlikely. Foraging and nesting habitat is absent. Segment 8: Possible. Suitable nesting habitat in the Puente/Chino Hills where there are historical records. Segment 10: Possible. Observed roosting in the vicinity. Could forage in open habitats. Segment 11: Possible in the Northern Region; Has been observed roosting in the vicinity. Could forage in open habitats. Unlikely in the Central Region; Habitats open enough to provide foraging habitat are absent from the ANF. Unlikely in the Southern Region; Foraging and nesting habitat is absent.
Short-eared Owl *Asio flammeus* (nestimg)	CSSC	Breeds in marshes or in nearby moist grasslands or fallow fields. Forages in the same habitats but may also forage in agricultural fields and dry grasslands.	Segment 4: Possible: Suitable breeding habitat is absent. It is likely to occur as a wintering bird, especially in the grasslands and agricultural fields. Segment 5: ~~Unlikely~~Absent: Does not occur due to lack of habitat. Segment 6: ~~Unlikely~~Absent: Does not occur due to lack of habitat. Segment 7: ~~Unlikely~~Absent: Does not occur due to lack of habitat. ~~Segment 8: Unlikely: Does not occur due to lack of habitat.~~ Segment 8: Possible: Suitable breeding habitat is absent. It is likely to occur as a wintering bird, especially in the grasslands and agricultural fields. Segment 10: ~~Unlikely~~Absent: Does not occur due to lack of habitat. Segment 11: ~~Unlikely~~Absent: Does not occur due to lack of habitat.
Western Burrowing Owl *Athene cuniculari* (burrowing sites and some wintering sites)	CSSC	Found in open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals, such as ground squirrels.	Segment 4: Possible. Suitable foraging habitat and California ground squirrel burrows that could provide breeding habitat are present. Segment 5: ~~Unlikely~~Possible. Within known range of species. Suitable foraging habitat is ~~present, though~~ present. California ground squirrel burrows or other burrows that could provide breeding habitat, were not observed. Segment 6: Likely. Observed within the ANF boundary in a private inholding near Kentucky Springs. Foraging and nesting habitat is absent within the ANF. Possible in the Northern Region; Suitable foraging habitat and California ground squirrel burrows that could provide breeding habitat are present. Segment 7: Possible. Some suitable habitat in open areas along the San Gabriel River where burrows are present in the upper banks of waterways in open habitats. Segment 8: Present. Observed in agricultural habitats east of Chino during reconnaissance surveys conducted in 2007. Also recorded at the Mira Loma substation, Sycamore Canyon, and Arroyo San Miguel in the Puente Hills Landfill Native Habitat Preservation Authority lands in 1999 and 2006. Segment 10: Present. Suitable foraging habitat and California ground squirrel burrows that could provide breeding habitat are present. Segment 11: Possible in the Northern Region; Suitable foraging habitat and California ground squirrel burrows that could provide breeding habitat are present. Unlikely in the Central and Southern Regions; Foraging and nesting habitat is absent.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Bell's Sage Sparrow *Amphispiza belli belli*	CDFG WL	Found in shrubby habitats including coastal sage scrub and chaparral, primarily of the chamise type.	Segment 4: Unlikely. No suitable breeding habitat exists, and this segment lies well outside the known range of the species. Segment 5: Unlikely. No suitable breeding habitat exists, and this segment lies well outside the known range of the species. Segment 6: Likely in the Central Region only; Suitable nesting habitat occurs at the south end of the ANF. There are historical nesting records nearby. Unlikely in the Northern Region; No suitable breeding habitat exists, and this segment lies well outside the known range of the species. Segment 7: Possible. Some suitable coastal sage scrub at the north end of this segment. Segment 8: Present. Some suitable nesting habitat remains in the Puente/Chino Hills, where there are historical/recent records. Segment 10: Unlikely. No suitable breeding habitat exists, and this segment lies well outside the known range of the species. Segment 11: Likely. Suitable nesting habitat occurs at the southern ANF boundary. There are historical nesting records nearby. Possible in the Southern Region; There is some suitable coastal sage scrub near the border with the ANF. Unlikely in the Northern Region; No suitable breeding habitat exists, and this segment lies well outside the known range of the species.
Southern California Rufous-crowned Sparrow *Aimophila ruficeps canescens*	CDFG WL	Sparse low brush, especially sage, located on grassy hill slopes and rocky hillsides.	Segment 4: Unlikely. Due to lack of habitat. Segment 5: Unlikely. Due to lack of habitat. Segment 6: Possible. Suitable nesting habitat occurs at the south end of ANF. ~~Unlikely~~Likely in Northern Region ~~due to lack of habitat.~~(based on observation at nearby Segment 11). Segment 7: Possible. Suitable nesting habitat occurs of the north end of this segment. Segment 8: Present. Observed in Chino Hills during surveys conducted in 2000, 2002, 2005, and 2007. Suitable nesting habitat occurs in the Puente/Chino Hills. Observed in the Puente Hills Landfill Native Habitat Preservation Authority lands in 2000 and 2005. Segment 10: Unlikely. Due to lack of habitat. Segment 11: Present in the Central and Southern Regions; Observed in suitable nesting habitat that occurs at the southern ANF boundary. Also observed in San Gabriel foothills south of the ANF during surveys conducted in 2007. ~~Unlikely~~Present in the Northern Region ~~Due to lack of habitat.~~(Aliso Canyon).
Black Swift *Cypseloides niger* (nesting)	CSSC	Nests behind or beside permanent or semi-permanent waterfalls on perpendicular cliffs near water, and in sea caves.	Segment 4: Unlikely. Outside the known range for this species. Segment 5: Unlikely. Outside the known range for this species. Segment 6: Possible in the Central Region. Two nesting sites documented in the San Gabriel Mountains. Unlikely in the Northern Region; outside the known range for this species. Segment 7: Unlikely. Outside the known range for this species. Segment 8: Unlikely. Outside the known range for this species. Segment 10: Unlikely. Outside the known range for this species. Segment 11: Possible in the Central Region. Two nesting sites documented in the San Gabriel Mountains. Unlikely in the Northern and Southern Regions; outside the known range for this species.
Vaux's Swift *Chaetura vauxi* (nesting)	CSSC	Nests in tree cavities and less frequently in artificial structures. Cavities must be large enough to fly into.	Segment 4: Unlikely. Outside the known range for this species. Segment 5: Unlikely. Outside the known range for this species. Segment 6: Possible in the Central Region. Known from the ANF (pers. comm. P. Krueger, FS). Segment 7: Unlikely. Outside the known range for this species. Segment 8: Unlikely. Outside the known range for this species. Segment 10: Unlikely. Outside the known range for this species. Segment 11: Possible in the Central Region. Known from the ANF (pers. comm. P. Krueger, FS).

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Coastal California Gnatcatcher *Polioptila californica californica*	FT, CSSC	Coastal sage scrub habitats of southern California coastal slope, generally below 950 feet.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 5: ~~Unlikely.~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 6: ~~Possible.~~Unlikely. Some marginally suitable habitat in San Gabriel foothills. ~~Gnatcatcher~~Although the gnatcatcher was detected in the city of Arcadia, below the Forest boundary the steep slopes above the valley do not provide quality habitat. Historic sightings have been found in Big Santa Anita Wash and Monrovia (Garrett 1993). ~~Unlikely in the Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species.~~ Segment 7: Present. Observed in the Montebello Hills in 2005~~.~~ and during protocol-level surveys in 2007 (AMEC, 2008). Segment 8: Present. Observed in the Montebello and Puente Hills Landfill Native Habitat Preservation Authority lands in 2005~~.~~, 2007, and 2009; Turnbull Canyon Road in 2007; and Powder Canyon in 2009. Segment 10: ~~Unlikely~~Absent. No suitable habitat exists, and this segment lies outside the known range of the species. Segment 11: ~~Possible~~Unlikely. Some marginally suitable habitat in San Gabriel foothills. Historic sightings of gnatcatchers have been found in Arroyo Seco, Rubio Canyon, and Pasadena (Garrett 1993). Unlikely in the Northern Region; No suitable habitat exists, and this segment lies outside the known range of the species. Unlikely in the Southern Region; Though there is some marginally suitable habitat in San Gabriel foothills, this area is outside, and higher in elevation, than species' known distribution CRITICAL HABITAT FOR THIS SPECIES IS DESIGNATED IN SEGMENTS 7 AND 8.
Gray Vireo *Vireo vicinior* (nesting)	CSSC	Found in desert scrub, mixed juniper or pinyon pine and oak scrub associations, and chaparral, in hot, arid mountains and high plains scrubland.	Segment 4: ~~Unlikely.~~Absent. Outside the known range for this species and no suitable habitat exists. Segment 5: ~~Unlikely~~Absent. Outside the known range for this species and no suitable habitat exists. Segment 6: Possible in the Central Region. Known from the ANF (pers. comm. P. Krueger, FS). Segment 7: ~~Unlikely.~~Absent. Outside the known range for this species and no suitable habitat exists. Segment 8: ~~Unlikely~~Absent. Outside the known range for this species and no suitable habitat exists. Segment 10: ~~Unlikely~~Absent. Outside the known range for this species and no suitable habitat exists. Segment 11: Possible in the Central Region. Known from the ANF (pers. comm. P. Krueger, FS).
Least Bell's Vireo *Vireo bellii pusillus*	SE, FE	Dense riparian scrub including willows and mulefat.	Segment 4: Unlikely. Does not occur due to lack of habitat. Segment 5: Possible. Potentially suitable breeding habitat along Amargosa Creek. Segment 6: Possible: Suitable habitat occurs in drainages in the San Gabriel foothills. Sightings occurred in Fish Canyon in 1974 and Van Tassel in 1975 (US Army Corps of Engineers 1994). Nesting of vireos below San Gabriel Reservoir in 1983 (Forest Records). In 2000, vireos were observed in Little Rock. Unlikely in the Northern Region; Does not occur due to lack of habitat. Segment 7: Present. Occurs at Whittier Narrows and in San Gabriel River, and Santa Fe Dam. Records in 2008 show this species at Whittier Narrows and San Gabriel River. Segment 8: Present. Observed at Whittier Narrows where there are several recent and historical occurrences documented. Also a single male observed in Sycamore Canyon in 2005 in the Puente Hills Landfill Native Habitat Preservation Authority lands. Five territories were detected in CHSP during surveys for the Alternative 4 routes in 2009. Segment 10: Unlikely. Does not occur due to lack of habitat. Segment 11: Possible in the Central and Southern Regions; Suitable habitat occurs in drainages in the San Gabriel foothills. In 2000, sightings occurred in Big Tujunga Canyon. In 1993, vireos were detected at the Sunnyside Debris Basin in Pasadena. Unlikely in the Northern Region; Does not occur due to lack of habitat.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Coastal Cactus Wren *Campylorhynchus brunneicapillus*	CSSC (San Diego and Orange Counties only)	Closely associated with coastal sage scrub vegetation that contains patches of cholla or prickly pear cactus. The species is usually found at elevations of 490 feet or less, but it is known to occur at elevations of up to 1,480 feet.	Segment 4: Unlikely. Outside of the known range for this species. Segment 5: Unlikely. Outside of the known range for this species. Segment 6: Possible. Scattered populations are known from the lower slopes of the San Gabriel Mountains but not known to occur on the ANF. Potential habitat exists on the ANF. Segment 7: Likely. Scattered populations are known from the lower slopes of the San Gabriel Mountains. Segment 8: Present. Documented in the Puente Hills Landfill Native Habitat Preservation Authority lands (LSA, 2000).Also present within Chino Hills State Park near Rolling M Ranch and in Aliso Canyon. Segment 10: Unlikely. Outside of the known range for this species. Segment 11: Possible. Scattered populations are known from the lower slopes of the San Gabriel Mountains but not known to occur on the ANF. Potential habitat exists on the ANF.
LeConte's Thrasher *Toxostoma lecontei*	CSSC	Occurs in desert scrub habitats, open washes, and Joshua tree woodland.	Segment 4: Possible. Suitable habitat is present in desert washes and desert scrub. Segment 5: Possible. Suitable habitat is present in desert washes and desert scrub communities. ~~Segment 10: Present. Recorded. Suitable habitat is present in desert washes and desert scrub communities.~~ Segment 6: Possible in the Northern Region; Suitable habitat is present in desert washes and desert scrub. Unlikely in the Central Region; Suitable habitat is absent. Segment 7: Unlikely. Suitable habitat is absent Segment 8: Unlikely. Suitable habitat is absent Segment 10: Present. Recorded (CNDDB, 2009). Suitable habitat is present in desert washes and desert scrub communities. Segment 11: Possible in the Northern Region; Suitable habitat is present in desert washes and desert scrub. Unlikely in the Central and Southern Regions; Suitable habitat is absent.
California Horned Lark Eremophila alpestris actia	CDFG WL	Occurs in open habitats, forages in bare dirt in short and/or sparse grassland and areas of scattered shrubs.	Segment 4: ~~Unlikely~~Absent. Foraging and nesting habitat is absent. Segment 5: ~~Unlikely~~Absent. Foraging and nesting habitat is absent. Segment 6: ~~Unlikely~~Absent. Foraging and nesting habitat is absent. Segment 7: Possible. Marginally suitable nesting habitat in the disturbed and ruderal habitats. Segment 8: Present. Observed in the Puente Hills Landfill Native Habitat Preservation Authority lands during surveys conducted in 2000. Segment 10: ~~Unlikely~~Absent. Foraging and nesting habitat is absent. Segment 11: ~~Unlikely~~Absent. Foraging and nesting habitat is absent.
Loggerhead Shrike *Lanius ludovicianus*	CSSC	Nests in isolated tall shrubs and dense trees (including Joshua trees) in open landscapes. Forages in desert scrub, agricultural fields, grasslands, and Joshua tree woodlands.	Segment 4: Present. Observed during reconnaissance surveys conducted in 2007. Suitable habitat is abundant. Segment 5: Present. Observed during reconnaissance surveys conducted in 2007. Suitable habitat is abundant. Segment 6: Present. Observed in the Northern Region during reconnaissance surveys conducted in 2007. Suitable habitat is abundant in the Northern Region. Observed within the ANF boundary in a private inholding near Kentucky Springs. Foraging and nesting habitat is absent from this alignment within the ANF. Segment 7: Likely. Suitable foraging and nesting habitat present at Whittier Narrows and much of this segment. Segment 8: Present. Suitable foraging and nesting habitat present at Whittier Narrows, the Puente/Chino Hills, and much of this segment. A pair was observed on Segment 8C during surveys conducted in 2007. Individual observed in Puente Hills Landfill Native Habitat Preservation Authority lands in 2000.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			Segment 10: Present Observed during reconnaissance surveys conducted in 2007. Suitable habitat is abundant. Segment 11: Present in the Northern Region; Observed in the Northern Region during reconnaissance surveys conducted in 2007. Suitable habitat is abundant in the Northern Region. Likely in the Southern Region; There is suitable foraging and nesting habitat in the San Gabriel foothills. Unlikely in the Central Region; Habitats open enough to provide foraging habitat are absent from the alignment through the ANF.
Olive-sided Flycatcher *Contopus cooperi* (nesting)	CSSC	Nests in late-successional coniferous forests with open canopies.	Segment 4: Unlikely. Outside the known range for this species. Segment 5: Unlikely. Outside the known range for this species. Segment 6: ~~Possible~~Present in the Central Region. Known from the ANF (AMEC, 2007; pers. comm. P. Krueger, FS). Segment 7: ~~Unlikely. Outside the known range for this species.~~Present. Observed in the Puente Hills Landfill Native Habitat Preservation Authority lands (LSA, 2007). ~~Segment 8: Unlikely. Outside the known range for this species.~~ Segment 8: Present. Observed in the Puente Hills Landfill Native Habitat Preservation Authority lands (LSA, 2007). Segment 10: Unlikely. Outside the known range for this species. Segment 11: ~~Possible~~Present in the Central Region. Known from the ANF (AMEC, 2007; pers. comm. P. Krueger, FS).
Southwestern Willow Flycatcher *Empidonax traillii extimus* (nesting)	SE, FE	Breeds in densely vegetated riparian associations of cottonwoods and willows	Segment 4: Unlikely. Does not occur due to lack of habitat. Segment 5: ~~Unlikely~~Likely. Marginally suitable breeding habitat along Amargosa Creek. Individuals of undetermined subspecies were detected in Amargosa Creek (AMEC, 2009). Segment 6: ~~Present~~ Likely in the Central Region; Riparian habitat within the ANF is marginally suitable. Individuals thought to be migrating through have been documented in West Fork San Gabriel River and Little Rock. Individuals of undetermined subspecies were detected in various locations in the ANF (AMEC, 2009). Unlikely in the Northern Region; Does not occur due to lack of habitat. Segment 7: ~~Possible~~Likely. Potential habitat at Whittier Narrows is only marginally suitable, and this species has not been ~~recorded~~ confirmed there. Individuals of undetermined subspecies were detected in various locations along this segment (AMEC, 2009). ~~Migrant Willow Flycatchers, most likely of more northerly subspecies, are likely.~~ Possibility of this species in the San Gabriel River Channel or Rio Hondo River Channel near Whittier Narrows. ~~Recent focused surveys did not detect the species (AMEC, 2007).~~ Segment 8: ~~Possible~~Likely. Potential habitat at Whittier Narrows is only marginally suitable and this species has not been recorded there. Individuals of undetermined subspecies were detected in various locations along this segment (AMEC, 2009). ~~Migrant Willow Flycatchers, most likely of more northerly subspecies, are likely. Recent focused surveys did not detect the species (AMEC, 2007).~~ Segment 10: Unlikely. Does not occur due to lack of habitat. Segment 11: ~~Possible~~ Likely in the Central and Southern Regions; Riparian habitat within the ANF is marginally suitable. Individuals thought to be migrating through have been documented in Lynx Gulch, Upper Big Tujunga Canyon, and Big Tujunga Canyon. Potential habitat in San Gabriel foothills is only marginally suitable~~, and this species has not been recorded there~~. Individuals of undetermined subspecies were detected in various locations in the ANF (AMEC, 2009).~~Migrant Willow Flycatchers, most likely of more northerly subspecies, are likely.~~ Unlikely in the Northern Region; Does not occur due to lack of habitat.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Vermilion Flycatcher *Pyrocephalus rubinus* (nesting)	CSSC	Nests in desert riparian and landscaped cottonwoods and other trees in developed areas including golf courses; often near agricultural or grassland areas.	Segment 4: Possible: Potential nesting habitat in the trees along roads and near houses on the Antelope Valley floor, especially in the vicinity of alfalfa fields. Segment 5: Possible: Potentially suitable breeding habitat along Amargosa Creek. Segment 6: ~~Unlikely~~Absent: Does not occur due to lack of habitat. Segment 7: Absent~~Unlikely~~: Does not occur due to lack of habitat. Segment 8: Absent~~Unlikely~~: Does not occur due to lack of habitat. Segment 10: Absent~~Unlikely~~: Does not occur due to lack of habitat. Segment 11: Absent~~Unlikely~~: Does not occur due to lack of habitat.
Summer Tanager *Piranga rubra* (nesting)	CSSC	Breeds in mature, desert riparian habitats dominated by cottonwood and willow.	Segment 4: Absent~~Unlikely~~. Does not occur due to lack of habitat. Segment 5: Possible. Potentially suitable breeding habitat along Amargosa Creek. Segment 6: Possible. Suitable habitat in some riparian habitats in the San Gabriel Mountains. Known from Little Rock Creek. Nesting records exist for Soledad Canyon (1998). Segment 7: Absent~~Unlikely~~. Does not occur due to lack of habitat. Segment 8: Absent~~Unlikely~~. Does not occur due to lack of habitat. Segment 10: Absent~~Unlikely~~. Does not occur due to lack of habitat. Segment 11: Possible. Suitable habitat in some riparian habitats in the San Gabriel Mountains. Known from Little Rock Creek. Nesting records exist for Soledad Canyon (1998). Unlikely in the Northern and Southern Regions; Does not occur due to lack of habitat.
Tricolored Blackbird *Agelaius tricolor* (nesting colony)	CSSC	Nests in freshwater emergent wetlands, nettle, thistle, willow riparian thickets, and in crops such as alfalfa and safflower.	Segment 4: Possible. Foraging birds are expected to occur in agricultural habitats. Nesting habitat is absent. Segment 5: ~~Unlikely. Does not occur due to lack of habitat~~Present. Foraging birds were observed in this area in 2009. Segment 6: ~~Unlikely~~Absent. Does not occur due to lack of habitat. Segment 7: Likely. Records of nesting from Legg Lake. Marginal nesting and foraging habitat elsewhere on the alignment. Segment 8: Present. Observed in agricultural/dairy habitats east of Chino during reconnaissance surveys conducted in 2007. Marginal nesting habitat was also observed there, though there was no evidence of nesting. Records of nesting from Legg Lake. Segment 10: Absent~~Unlikely~~. Does not occur due to lack of habitat. Segment 11: Absent~~Unlikely~~. Foraging and nesting habitat is absent.
Yellow-headed Blackbird *Xanthocephalus xanthocephalus* (nesting)	CSSC	Breeds in prairie wetlands and along other western lakes and marshes where tall reeds and rushes are present. Forages in the wetlands and in surrounding grasslands and croplands. In winter large flocks forage in agricultural areas.	Segment 4: Unlikely. Outside the known range for this species, nesting habitat lacking but nearby nesting sites exist in Antelope Valley. Segment 5: Unlikely. Outside the known range for this species, nesting habitat lacking but nearby nesting sites exist in Antelope Valley. Segment 6: Possible in the Central Region~~.~~ but nesting unlikely (AMEC, 2007). Known from the ANF (pers. comm. P. Krueger, FS). Segment 7: Unlikely. Outside the known range for this species. Segment 8: Unlikely. Outside the known range for this species~~.~~ Segment 10: Unlikely. Outside the known range for this species, nesting habitat lacking but nearby nesting sites exist in Antelope Valley. Segment 11: Possible in the Central Region~~.~~ but nesting unlikely (AMEC, 2007). Known from the ANF (pers. comm. P. Krueger,

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
			FS).
Yellow Warbler *Dendroica petechia* (nesting)	CSSC	Breeds in riparian woodlands, particularly those dominated by willows and cottonwoods.	Segment 4: Unlikely. Does not occur due to lack of habitat. Segment 5: ~~Unlikely. Does not occur due to lack of~~Possible. Marginal habitat occurs at Amargosa Creek. Segment 6: Likely. Suitable habitat is present in riparian habitats in the San Gabriel Mountains. Unlikely in the Northern Region due to lack of habitat. Segment 7: Likely. Suitable nesting habitat is present at the Rio Hondo and Whittier Narrows Segment 8: ~~Likely~~Present. Suitable nesting habitat is present at the Rio Hondo, Whittier Narrows, and in riparian habitats in Chino Hills. Observed in the Puente Hills Landfill Native Habitat Preservation Authority lands in 2000. Observed in CHSP during surveys conducted for the Alternative 4 routes in 2009. Segment 10: Unlikely. Does not occur due to lack of habitat. Segment 11: Present in the Central Region; Nesting pairs have been recorded in the Arroyo Seco. Suitable habitat is present in riparian habitats in the San Gabriel Mountains. Likely in the Southern Region; There is suitable habitat in some riparian areas in San Gabriel foothills including Arroyo Seco and Eaton Wash. Unlikely in the Northern Region due to lack of habitat.
Yellow-breasted Chat *Icteria virens (*nesting)	CSSC	Breeds in riparian habitats with dense understory vegetation, such as willow and blackberry.	Segment 4: Unlikely. No suitable habitat exists. Segment 5: ~~Unlikely. No suitable~~Possible. Suitable habitat ~~exists~~occurs at Amargosa Creek. Segment 6: Possible. Suitable habitat in some riparian habitats such as Big Tujunga Creek. Unlikely in the Northern Region; No suitable habitat exists. Segment 7: ~~Possible. Suitable habitat~~Present. Occurs in the Whittier Narrows~~.~~ and along the Rio Hondo (AMEC, 2007). Segment 8: Present. Observed in Whittier Narrows and riparian habitats in the Chino Hills during 2007. Also observed in Puente Hills in 2000, 2002, and 2005 and specifically within the Puente Hills Landfill Native Habitat Preservation Authority lands in 2000 and 2005. Segment 10: Unlikely. No suitable habitat exists. Segment 11: Possible in the Central and Southern Regions; Suitable habitat in some riparian areas in San Gabriel foothills, including Arroyo Seco and Big Tujunga Creek. Unlikely in the Northern Region; No suitable habitat exists.
Western Yellow-billed Cuckoo *Coccyzus americanus* (nesting)	FC, SE, FSS	Breeds in densely vegetated riparian associations of cottonwoods and willows	Segment 4: ~~Unlikely.~~Absent. Does not occur due to lack of habitat, outside the known range. Segment 5: Unlikely. Marginally suitable breeding habitat along Amargosa Creek. Segment 6: Unlikely. Riparian habitat within the ANF is marginally suitable and species has not been recorded within this region. Segment 7: Present. One individual was observed at the Rio Hondo in 2009 (M. Benjamins, pers. comm.) Potential habitat occurs at Whittier Narrows and in drainages in the Puente/Chino Hills, although this species has not been recorded there.~~Unlikely. Potential habitat at the Rio Hondo and Whittier Narrows are only marginally suitable, and this species has not been recorded there~~ Segment 8: ~~Unlikely~~Present. ~~Potential habitat~~One individual was observed at the Rio Hondo in 2009 (M. Benjamins, pers. comm.)~~,~~ Potential habitat occurs at Whittier Narrows~~,~~ and in drainages in the Puente/Chino Hills, although ~~are only marginally suitable, and~~ this species has not been recorded there. Segment 10: ~~Unlikely.~~Absent. Does not occur due to lack of habitat, outside the known range. Segment 11: Unlikely. Potential habitat in San Gabriel foothills is only marginally suitable, and this species has not been recorded within this region.

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Mountain Plover *Charadrius montanus*	CSSC	Winters in short grasslands and agricultural fields. Breeds in short-grass prairies outside of California.	Segment 4: Possible. Wintering flocks annually occur in agricultural fields in the Antelope Valley. The alfalfa fields are the most likely locations for this species, but they may also visit the numerous grasslands in the Project area. Segment 5: Unlikely. Plovers wintering in the Antelope Valley primarily occur in agricultural fields, which are absent. There is a possibility that they may forage in the numerous grasslands in the Project area. Segment 6: Unlikely. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 7: Unlikely. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 8: Unlikely. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species. Segment 10: Unlikely. Does not occur due to lack of habitat. Segment 11: Unlikely. Not likely to occur due to lack of habitat and segment is outside of the known distribution for this species.
~~Brant *Branta bernicla*~~	~~CSSC~~	~~Inhabits well protected, shallow marine waters.~~	~~Segment 4: Unlikely. Segment is outside of the range for this species and no suitable habitat exists.~~ ~~Segment 5: Unlikely. Segment is outside of the range for this species and no suitable habitat exists~~ ~~Segment 6: Unlikely. Segment is outside of the range for this species and no suitable habitat exists~~ ~~Segment 7: Unlikely. Segment is outside of the range for this species and no suitable habitat exists~~ ~~Segment 8: Unlikely. Segment is outside of the range for this species and no suitable habitat exists~~ ~~Segment 10: Unlikely. Segment is outside of the range for this species and no suitable habitat exists~~ ~~Segment 11: Unlikely. Segment is outside of the range for this species and no suitable habitat exists.~~
Common Loon *Gavia immer* (nesting)	CSSC	Loons nest on lakes and large ponds. They prefer to nest offshore, on islands, islets, or floating mounds of vegetation in shallow water. In winter, loons migrate to shallow coastal marine habitat.	Segment 4: Unlikely. No suitable habitat exists, within wintering range. Segment 5: Unlikely. ~~No suitable~~Potential habitat ~~exists~~may occur at Lake Palmdale. Segment 6: Unlikely. No suitable habitat exists, within wintering range. Segment 7: Unlikely. ~~No suitable~~Potential habitat ~~exists~~may occur at ponds at the sand and gravel mines along segment 7 near the Santa Fe Dam Recreation Area. Segment 8: Unlikely. Marginal habitat exists in the Whittier Narrows area. Potential habitat may occur at Legg Lake. Segment 10: Unlikely. No suitable habitat exists within wintering range. Segment 11: Unlikely. No suitable habitat exists~~.~~ within wintering range.
Double-Crested Cormorant *Phalacrocorax auritus* (rookery site)	CDFG WL	Found in diverse aquatic habitats, such as ponds, lakes, rivers, lagoons, estuaries, and open coastline; more widespread in winter.	Segment 4: Unlikely. Generally a coastal species but may migrate through the area. Segment 5: Unlikely. Generally a coastal species but may migrate through the area. Segment 6: ~~Possible~~ Present in the Central Region (Forest Records, 2009). Known from the ANF (pers. comm. P. Krueger, FS). Segment 7: ~~Unlikely. Generally~~Present. Observed at and near Santa Fe Dam. Likely a ~~coastal species~~transient in this area, but ~~may migrate through the area.~~could nest in Santa Fe Dam (AMEC, 2007). ~~Segment 8: Unlikely. Generally a coastal species but may migrate through the area.~~Segment 8: Present. Observed at Whittier Narrows, and potential nesting habitat is present (AMEC, 2007). Segment 10: Unlikely. Generally a coastal species but may migrate through the area. Segment 11: Possible in the Central Region. Known from the ANF (pers. comm. P. Krueger, FS).

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Fulvous whistling-duck *Dendrocygna bicolor* (nesting)	CSSC	Inhabits freshwater and coastal marshes.	Segment 4: ~~Unlikely.~~Absent. Outside of current range of species and no suitable habitat exists. Segment 5: ~~Unlikely~~Absent. Outside of current range of species and no suitable habitat exists. Segment 6: ~~Unlikely~~Absent. Outside of current range of species and no suitable habitat exists. Segment 7: ~~Unlikely~~Absent. Outside of current range of species and no suitable habitat exists. Segment 8: ~~Unlikely~~Absent. Outside of current range of species and no suitable habitat exists. Segment 10: ~~Unlikely~~Absent. Outside of current range of species and no suitable habitat exists. Segment 11: ~~Unlikely.~~Absent. Outside of current range of species and no suitable habitat exists.
Least Bittern *Ixobrychus exilis*	CSSC (nesting only)	Occurs in marshes and edges of ponds and reservoirs that are covered with tules or cattails.	Segment 4: Absent~~Unlikely~~. Suitable habitat is absent. Segment 5: Absent~~Unlikely~~: Suitable habitat is absent. Segment 6: Absent~~Unlikely~~. Suitable habitat is absent. Segment 7: Likely. There are breeding season records from Legg Lake and Whittier Narrows. Segment 8: Likely. There are breeding season records from Legg Lake and Whittier Narrows. Segment 10: Absent~~Unlikely~~. Suitable habitat is absent. Segment 11: Absent~~Unlikely~~. Suitable habitat is absent.
Redhead *Aythya Americana* (nesting)	CSSC	Inhabits marshes, sloughs, ponds and lakes. Generally prefer deep, open water with emergent vegetation.	Segment 4: Absent~~Unlikely~~. Suitable habitat is absent~~unavailable~~. Segment 5: Absent~~Unlikely~~. Suitable habitat is absent~~unavailable~~. Segment 6: Absent~~Unlikely~~. Suitable habitat is absent~~unavailable~~. Segment 7: Possible. Suitable habitat is present. Occurrence near Santa Fe Dam is most likely during winter. Nesting possible in the Whittier Narrows area. Segment 8: Possible. Suitable habitat is present. Nesting is possible in the Whittier Narrows area. Segment 10: Absent~~Unlikely~~. Suitable habitat is absent~~unavailable~~. Segment 11: Absent~~Unlikely~~. Suitable habitat is absent~~unavailable~~.
White-faced Ibis *Plegadis chihi* (rookery site)	CDFG WL	Forage in marshes, mudflats, shallow rivers, and irrigated croplands. Nest in dense emergent vegetation.	Segment 4: Absent~~Unlikely~~. Suitable foraging and nesting habitat is absent Segment 5: Absent~~Unlikely~~. Suitable foraging and nesting habitat is absent Segment 6: Absent~~Unlikely~~. Suitable foraging and nesting habitat is absent Segment 7: Unlikely. Nesting habitat is absent. Foraging habitat in San Gabriel River at Santa Fe Dam and Whittier Narrows is marginal Segment 8: Present. Observed at east end in Cucamonga Creek and in dairy ponds. However, nesting habitat is absent from Segment 8. Segment 10: Absent~~Unlikely~~. Suitable foraging and nesting habitat is absent Segment 11: Absent~~Unlikely~~. Suitable foraging and nesting habitat is absent

Table 3.4-7. Special-Status Wildlife with the Potential to Occur in the Project Area

Name	Status*	Habitat	Occurrence Within Project Area
Wood Stork *Mycteria Americana*	CSSC	Forage in shallow bays, marshes, canals and drains. They have been known to also forage in well-irrigated agricultural fields.	Segment 4: ~~Unlikely.~~Absent. No suitable habitat exists, outside of the known range. Segment 5: ~~Unlikely.~~Absent. No suitable habitat exists~~.~~, outside of the known range. Segment 6: ~~Unlikely.~~Absent. No suitable habitat exist, outside of the known range. Segment 7: Absent. No suitable habitat exists~~.~~, outside of the known range. ~~Segment 7: Unlikely. No suitable habitat exists.~~ Segment 8: Unlikely. Marginal habitat exits in this segment. Segment 10: ~~Unlikely.~~Absent. No suitable habitat exists~~.~~, outside of the known range. Segment 11: ~~Unlikely.~~Absent. No suitable habitat exists~~.~~, outside of the known range.

FC = Federal Candidate Species
FT = Federally Threatened Species
FE = Federally Endangered Species
FD = Federally Delisted
PT = Federally Proposed Threatened Species
FP = Federally Protected Species
FSS = USDA Forest Service Sensitive Species
ST= State Threatened species
SE = State Endangered Species
CSSC = California Species of Special Concern
CDFG WL = CDFG Watch List Species
CDFG FP = State Fully Protected Species
SCD = State Candidate for Delisting

raccoon, striped skunk, and opossum. Increased mesopredator populations, in turn, introduce a threat to populations of smaller prey species, particularly birds (Soule et. al., 1988). This occurs because mesopredators are efficient hunters of birds and bird nests which are largely ignored by the larger predators (CBI, 2005).

The corridor supports several areas of high-quality habitat for a variety of special-status bird species, including coastal California gnatcatcher, least Bell's vireo, northern harrier, and cactus wren (Cooper, 2000). Several amphibian and reptile species also occur in the area; however, there appears to be a gradient of declining diversity and evenness of these species moving west from the Chino Hills. This is likely a result of an increase in edge effects and mortality risks in more fragmented portions of the corridor that occur farther west from source populations (Haas et. al., 2002).

All existing roads within the corridor serve as barriers to some extent, ranging from highly permeable and permeable filters such as Turnbull Canyon Road and Carbon Canyon Road, respectively, to barriers such as the San Gabriel Freeway (which isolates the Whittier Narrows connection in the northwest), Harbor Boulevard, and State Routes 57 and 91 (CBI, 2005). State Routes 57 and 91 represent absolute barriers to wildlife movement with the exceptions of the Tonner Canyon Bridge and Coal Canyon Underpass, respectively. While Segment 8 of the proposed alignment occurs north of the arbitrary boundaries of the Chino-Puente Hills Wildlife Corridor, it traverses continuous habitat associated with many of the same geographic units~~, therefore, occurring within the zone of influence for the corridor's functionality~~.

Another wildlife movement corridor in the Southern Region is the San Gabriel River corridor that extends from the San Gabriel Mountains in the north to Whittier Narrows in the south. This area consists primarily of a channelized segment of the San Gabriel River in an urban landscape. This corridor allows movement for wildlife across the San Gabriel Valley. Many large mammals, raccoons, coyotes, and mountain lions have been documented using the flood control channels from the mountains into the various drainages for the Los Angeles and San Gabriel Rivers.

Just prior to exiting the southern boundary of the ANF, Segment 11 bisects the Arroyo Seco as it flows from the San Gabriel Mountains south towards the Los Angeles Basin and eventually connects with the Los Angeles River near the intersection of the 5 and 110 freeways in the City of Los Angeles. The Arroyo Seco provides a transitional linkage between the urbanized environment to the south and the vast open space of the ANF. This area lies within the boundaries of the Hahamongna Watershed Park Master Plan (City of Pasadena, 2003). According to the Plan, more than 100 animal species were observed during surveys conducted within the Plan boundaries. The Upper Arroyo Seco in this area is dominated by riparian scrub and non-native grassland habitats with oak woodlands and other scrub habitats occupying patchy areas along the banks. As the Arroyo Seco extends south towards greater metropolitan Los Angeles, the majority of the vegetation occupying the channel and banks is replaced by concrete lining; however, small patches of native vegetation occur sporadically along the course towards the Los Angeles River. The presence of native vegetation amidst heavily developed surroundings, coupled with the downstream connection to the Los Angeles River, provides adequate habitat for wildlife movement through this area. Additionally, the Arroyo Seco provides a linkage to wilderness areas in the surrounding urban areas, such as Pasadena, Glendale, and La Canada-Flintridge.

3.4.2.3.4 Special-Status Species Occurrence Tables

Table 3.4-6 lists the potential for special-status plant species to occur in the proposed Project area. Table 3.4-7 lists the potential for special-status wildlife to occur in the proposed Project area. Likelihood for occurrence is defined as follows:

Present: Species or sign of their presence recently observed on the site
Likely: Species or sign not observed on the site, but reasonably certain to occur on the site based on conditions, species ranges, and recent records.
Possible: Species or sign not observed on the site, but conditions suitable for occurrence and/or an historical record exists in the vicinity.
Unlikely: Species or sign not observed on the site, but conditions marginal for occurrence
Absent: Species or sign not observed on the site, ~~,~~ outside of the known range, and conditions unsuitable for occurrence

3.4.2.4 Alternative 3: West Lancaster Alternative

Alternative 3 includes a minor re-route of the proposed Project in the West Lancaster area of the Northern Region, as described in Section 2.3. The affected environment for Alternative 3 would be exactly the same as the proposed Project, with regard to Biological Resources. Therefore, the protected habitats and special-status plant and animal species described above in Section 3.4.2.3 apply to Alternative 3 as well as the proposed Project. Habitats occurring within the re-routed portion of this alternative are listed in Table 3.4-8 below. Acres impacted by this alternative are unknown at this time as final engineering has not been completed.

Table 3.4-8. Vegetation Types Occurring in the Alternative 3 Re-Route

Habitat Type	Acres	Percentage of Total Acreage
California Annual Grassland	351.06	94.21%
Barren/Developed	13.47	3.62%
Desert Wash	6.81	1.83%
Wildflower Field	1.28	0.34%
Total	372.63	100.00%

3.4.2.5 Alternative 4: Chino Hills Route Alternatives

Under Alternative 4, the proposed transmission line would follow the same route as the proposed Project through the Northern and Central Regions. In the Southern Region, under Alternative 4, Segment 8A would diverge from the proposed Project route at S8A MP 19.2 and turn to the southeast, crossing through part of Orange County before entering San Bernardino County and the Chino Hills State Park (CHSP/Park). No construction would occur along Segment 8C, but upgrades to Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario would occur as described under Alternative 2.

While all of the same habitats and special-status species described as occurring in the Southern Region (see Section 3.4.2.3) also occur, or have the potential to occur, within Alternative 4, the quantity of these habitats within the Affected Environment of Segment 8A would be different than that of the proposed Project from S8A MP 19.2 to 35.2. In addition, two new habitats (Mixed Chaparral, Recently Burned and Mexican Elderberry/Giant Wild Rye Scrub) occur within the proposed alternative alignment as discussed in greater detail below. The proposed routes for Alternative 4 would cross through parts of Orange County, which the proposed Project (Alternative 2) would not enter, and San Bernardino County. ~~The upgrades associated with Segments 8B and 8C would not occur.~~ The routing options for Alternative 4 would also cross through the CHSP and would include a new switching station within or adjacent to the Park. The five~~our~~ different routing options (Routes A through D and C Modified), which are included under Alternative 4, are discussed in further detail below.

Acres impacted by this alternative are unknown at this time as final engineering has not been completed.

Route A

As described in Section 2.4 (Alternative 4: Chino Hills Route Alternative), this alternative deviates from the proposed Project route at Segment 8A MP 19.2 and parallels the existing Walnut/Olinda-Mira Loma 220-kV transmission line for 6.2 miles, 2.3 miles of which would be within the CHSP. Route A would be situated within an existing utility corridor, but requires that the corridor be widened by 150 feet along the length of Route A. In addition, Route A would require the installation of a new switching station within the CHSP. The new switching station would be a minimum of four to five acres in size and employ gas-insulated technology. Habitats occurring within Route A are listed in Table 3.4-9 below. As described above, the majority of these habitats also occur within the proposed Project and are described in detail in Appendix H of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~). Aliso Creek and approximately 11 unnamed drainages and small tributaries would be crossed by Route A, as well several areas of Mixed Chaparral, Recently Burned habitat not previously described. A description of this habitat type and its relation to Route A is provided below.

Table 3.4-9. Vegetation Types Occurring in the Alternative 4A Re-Route

Habitat Type	Acres	Percentage of Total Acreage
Mixed Chaparral	302.03	35.49%
California Annual Grassland	178.80	21.01%
Mixed Chaparral, Recently Burned	117.99	13.86%
Coastal Sage Scrub	82.56	9.70%
Coast Live Oak Woodland	71.66	8.42%
Southern Coast Live Oak Riparian Forest	40.33	4.74%
California Walnut Woodland	25.05	2.94%
Barren/Developed	18.21	2.14%
Bunchgrass Grassland	7.66	0.90%
Chamise Chaparral	4.17	0.49%
Freshwater Marsh	1.40	0.16%
Ruderal Grassland	0.58	0.07%
Mule Fat Scrub	0.51	0.06%
Southern Arroyo Willow Riparian Forest	0.13	0.02%
Total	851.08	100.00%

Mixed Chaparral, Recently Burned

Throughout the north-central portion of CHSP, and continuing to the northwest within private lands outside of the park, large contiguous stands of Mixed Chaparral occur, bisected by riparian drainages and interspersed with areas of grassland and California walnut woodland. Recently, most likely within the past two years, a significant portion of these mixed chaparral stands were burned. Burn intensity was moderate, clearing the shrub canopy dominated by lemonadeberry, sugarbush, thick-leaved and hairy yerba santa, poison oak, scrub oak, chamise, Mexican elderberry, buckbrush, whitebark lilac, hairy lilac, California Encelia, and bush mallows. Many of these chaparral species were observed to be resprouting from crowns during the 2008 spring surveys. The herbaceous layer is diverse, containing many native species, several of which may be fire-followers to some degree. These included several species of milk vetch (although Brauton's milk vetch was not observed), blue fiesta flower, common Eucrypta, and phacelias.

Route B

Route B would follow the same path as Route A into the CHSP, but instead of terminating at the new switching station described above, Route B continues to just beyond the eastern Park boundary, eventually

terminating at a new switching station outside of the CHSP. As with the Route A alternative, the new switching station for Route B would be a minimum of four to five acres in size. Route B would travel through the CHSP for approximately 4.9 miles. Habitats occurring within Route B are listed in Table 3.4-10 below. As described above, the majority of these habitats also occur within the proposed Project and are described in detail in Appendix H of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~). Aliso Creek and approximately 19 unnamed drainages and small tributaries would be crossed by Route B, as well several areas of Mexican Elderberry/Giant Wildrye Scrub habitat not previously described. A description of this habitat type and its relation to Route B is provided below.

Table 3.4-10. Vegetation Types Occurring in the Alternative 4B Re-Route

Habitat Type	Acres	Percentage of Total Acreage
California Annual Grassland	412.20	36.13%
Mixed Chaparral	305.24	26.75%
Mixed Chaparral, Recently Burned	117.99	10.34%
Coastal Sage Scrub	95.78	8.39%
Coast Live Oak Woodland	79.09	6.93%
Barren/Developed	28.81	2.53%
Southern Coast Live Oak Riparian Forest	28.48	2.50%
California Walnut Woodland	20.97	1.84%
Mexican Elderberry/Giant Ryegrass Scrubland	14.37	1.26%
Southern Sycamore Alder Riparian Woodland	12.24	1.07%
Bunchgrass Grassland	9.22	0.81%
Southern Arroyo Willow Riparian Forest	5.11	0.45%
Chamise Chaparral	4.17	0.37%
Southern Willow Scrub	4.04	0.35%
Freshwater Marsh	1.61	0.14%
Mule Fat Scrub	1.09	0.10%
Ruderal Grassland	0.58	0.05%
Total	1140.99	100%

Mexican Elderberry/Giant Wildrye Scrub

Within the eastern portion of CHSP, a matrix of California Annual Grassland and Coastal Sage Scrub is interspersed by scrub areas supporting a relatively high cover (approximately 5%) of arborescent Mexican elderberry and a grassy understory with frequent patches of giant wildrye clones. This association primarily occurred on south-facing exposures of steep, well-drained hillsides. This vegetation type differs from grassland types by providing a tree-like canopy that is relatively tall (approximately 7-12 feet) but sparse, similar to that seen in some savannah vegetation types. The grassy understory of Mexican Elderberry/Giant Wildrye Scrub principally supports herbaceous vegetation typical of annual grasslands, differentiating this vegetation type from Coastal Sage Scrub, although some small subshrubs such as deerweed were observed. Additionally, as giant wildrye culms often reach 6 to 7 feet in height, and leaf-bunches can be 2-feet tall, additional shrub-like structure is provided by this bunchgrass.

Route C

The Route C alternative would deviate from the proposed Project route at Segment 8A MP 19.2 and would parallel the existing Walnut/Olinda-Mira Loma 220-kV transmission line for approximately 4.2 miles to the CHSP boundary. This portion of the alternative would require the existing utility corridor to be widened by an additional 150 feet to accommodate new 500-kV double-circuit structures. Beyond this point, Route C would require a new 300-foot-wide ROW for approximately 1.5 miles as it travels east just north of the CHSP boundary. Route C would require a new switching station adjacent to the CHSP

boundary. An additional component of the Route C alternative would be the re-routing of two existing transmission lines located within CHSP, which would require approximately 3.1 miles of new ROW within CHSP. Habitats occurring within Route C are listed in Table 3.4-11 below. As described above, the majority of these habitats also occur within the proposed Project and are described in detail in Appendix H of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~). Aliso Creek and approximately 10 unnamed drainages and small tributaries would be crossed by Route C.

Table 3.4-11. Vegetation Types Occurring in the Alternative 4C Re-Route

Habitat Type	Acres	Percentage of Total Acreage
California Annual Grassland	402.56	35.79%
Mixed Chaparral	342.41	30.44%
Coastal Sage Scrub	128.18	11.40%
Mixed Chaparral, Recently Burned	73.26	6.51%
Coast Live Oak Woodland	72.80	6.47%
Southern Coast Live Oak Riparian Forest	32.48	2.89%
California Walnut Woodland	30.94	2.75%
Barren/Developed	22.04	1.96%
Southern Sycamore Alder Riparian Woodland	6.95	0.62%
Chamise Chaparral	4.17	0.37%
Mule Fat Scrub	3.79	0.34%
Southern Willow Scrub	2.31	0.21%
Bunchgrass Grassland	1.39	0.12%
Southern Arroyo Willow Riparian Forest	0.61	0.05%
Ruderal Grassland	0.58	0.05%
Freshwater Marsh	0.22	0.02%
Total	1124.69	100%

Route C Modified

Alternative 4, Route C Modified ("Route 4C Modified") is similar to the original Route C option discussed above, with the exceptions that (1) the new gas-insulated switching station would be located approximately 2,500 feet northwest of the location described for the original Alternative 4C, (2) transmission line configurations and access roads would be altered to account for relocation of the switching station, and (3) re-routing of the existing single-circuit 500-kV towers in CHSP to the new switching station would occur utilizing double-circuit 500-kV towers. As with the original Route C, this proposed Route 4C Modified would also divert from the proposed Project Segment 8A at Mile 19.2, as well as re-route the existing 500-kV and 220-kV T/Ls from within CHSP, through a new switching station located north of CHSP.

After diverging from Segment 8A at Mile 19.2, Route 4C Modified would turn to the southeast, continuing for approximately 3.9 miles (versus 4.2 miles under the original Route 4C), running parallel and south of the existing Mira Loma–Walnut/Olinda 220-kV double-circuit T/L. This portion of Route 4C Modified would require a ROW expansion of approximately 150 feet in width to accommodate the new 500-kV double-circuit T/L structures. Approximately 0.3 mile north of the CHSP boundary, Route 4C Modified would turn east within a new 300-foot-wide ROW for 0.9 mile, remaining north of the CHSP boundary, then turning northeast for approximately 0.4 mile, still within the new 300-foor-wide ROW, to a new 500-kV gas-insulated switching station. This portion of the Route 4C Modified Alternative, from the point it diverges from Segment 8A, would be approximately 5.2 miles long. Existing transmission lines within and near Chino Hills State Park would also be removed and re-routed as part of this

alternative. Habitats occurring within Route 4C Modified are listed in Table 3.4-11a below. As described above, these habitats also occur within the proposed Project and are described in detail in Appendix H of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009). Approximately 12 unnamed drainages and small tributaries would be crossed by Route C Modified.

Table 3.4-11a. Vegetation Types Occurring in the Alternative 4C Modified Re-Route

Habitat Type	Acres	Percentage of Total Acreage
Mixed Chaparral	378.48	33.59%
California Annual Grassland	306.48	27.20%
Coastal Sage Scrub	129.24	11.47%
Coast Live Oak Woodland	121.79	10.81%
California Walnut Woodland	67.91	6.03%
Mixed Chaparral, Recently Burned	54.01	4.79%
Disturbed/Developed	34.1	3.03%
Southern Coast Live Oak Riparian Forest	23.17	2.06%
Bunchgrass Grassland	5.22	0.46%
Chamise Chaparral	4.19	0.37%
Mule Fat Scrub	1.35	0.12%
Ruderal Grassland	0.58	0.05%
Southern Sycamore Alder Riparian Woodland	0.28	0.02%
Southern Arroyo Willow Riparian Forest	0.01	0.00%
Total	1126.81	100%

Route D

The proposed Route D alternative would follow the same path as the proposed Route C alternative, but instead of terminating at a switching station after paralleling the existing Walnut/Olinda-Mira Loma 220-kV transmission line for approximately 4.2 miles, Route D would continue to follow the western and northern boundary of CHSP for an additional 3.7 miles, approximately, before crossing through 1.4 miles of the Park in a southeasterly direction and terminating at a new switching station just outside the eastern Park boundary. The proposed switching station for Route D would be in the same location as that proposed for the Route B alternative. Habitats occurring within Route D are listed in Table 3.4-12 below. As described above, these habitats also occur within the proposed Project and are described in detail in Appendix H of the *Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~). Aliso Creek and approximately 28 unnamed drainages and small tributaries would be crossed by Route D.

Table 3.4-12. Vegetation Types Occurring in the Alternative 4D Re-Route

Habitat Type	Acres	Percentage of Total Acreage
Bunchgrass Grassland	1.27	0.11%
California Annual Grassland	428.58	36.33%
California Walnut Woodland	12.22	1.04%
Chamise Chaparral	4.17	0.35%
Coast Live Oak Woodland	73.84	6.26%
Coastal Sage Scrub	143.27	12.15%
Barren/Developed	26.84	2.28%
Freshwater Marsh	0.13	0.01%
Mexican Elderberry/Giant Ryegrass Scrubland	28.67	2.43%
Mixed Chaparral	328.32	27.83%
Mixed Chaparral, Recently Burned	73.26	6.21%
Mule Fat Scrub	2.11	0.18%
Ruderal Grassland	0.58	0.05%

Table 3.4-12. Vegetation Types Occurring in the Alternative 4D Re-Route		
Habitat Type	Acres	Percentage of Total Acreage
Southern Arroyo Willow Riparian Forest	4.23	0.36%
Southern Coast Live Oak Riparian Forest	39.83	3.38%
Southern Sycamore Alder Riparian Woodland	2.34	0.20%
Southern Willow Scrub	9.93	0.84%
Total	1179.59	100%

3.4.2.6 Alternative 5: Partial Underground Alternative

As described in Section 2.5, this alternative deviates from the proposed Project by the installation of an underground line through approximately 3.5 miles of the Chino Hills, between MP 21.9 and 25.4 of Segment 8A. This re-route would occur underneath the City of Chino Hills and increase the overall impact acreage of Segment 8 by approximately nine acres (seven acres of barren/developed and two acres of California annual grassland) due to the placement of the two required transition stations.

The portion of Segment 8 that would be re-routed underground for Alternative 5 is primarily located within developed areas of the City of Chino Hills, although the Western Transition Station is located in California annual grassland. Land use on either side of the re-routed segment is characterized as barren/developed. As this alternative would occur along the exact same alignment as the proposed Project and traverse identical habitats, no new biological resources would be introduced. The Affected Environment along the rest of the Alternative 5 route in the Southern Region is identical to the proposed Project. Table 3.4-13 lists the habitats occurring in the Alternative 5 re-route.

Table 3.4-13. Vegetation Types Occurring in the Alternative 5 Re-Route		
Habitat Type	Acres	Percentage of Total Acreage
Bunchgrass Grassland	1.18	0.27%
California Annual Grassland	14.45	3.27%
Coast Live Oak Woodland	1.20	0.27%
Coastal Sage Scrub	6.42	1.45%
Barren/Developed	308.74	69.82%
Nonnative Woodland	21.34	4.83%
Ruderal Grassland	79.59	18.00%
Southern Arroyo Willow Riparian Forest	4.00	0.90%
Southern Willow Scrub	0.64	0.14%
Water	4.61	1.04%
Total	442.17	100.00%

3.4.2.7 Alternative 6: Maximum Helicopter Construction in the ANF Alternative

Alternative 6 includes the maximum amount of helicopter construction on the ANF (Segments 6 and 11). This alternative follows the same route for the transmission line as the proposed Project in all three regions, as described in Section 2.6. The affected environment for the Alternative 6 transmission line route, in terms of the habitats present and species potentially impacted, would be the same as the proposed Project, with regard to Biological Resources. Therefore, the unique habitats and special-status plant and animal species described above in Section 3.4.2.3 apply to Alternative 6 as well as the proposed Project. However, many wildlife species are dependent upon riparian conservation areas (RCAs) (a limiting resource on the ANF) for foraging, breeding and movement corridors. This alternative reduces the number of RCAs impacted by this project by reducing the amount of roads and therefore ground disturbance. ~~However~~Additionally, preliminary surveys have found that several special-status plant and animal species occur alongside access roads or within spur roads proposed under Alternative 2. Under

Alternative 6 these populations would not be adversely impacted because the roads would not be utilized. As compared to the proposed Project, this alternative is expected to decrease the overall impact to biological resources, with the exception of additional noise and disturbance caused by helicopter operation, by limiting the amount of ground disturbance and therefore, loss of vegetation and habitat.

This alternative would require ~~eleven~~ thirteen helicopter staging and landing areas ranging in size from two acres to over four acres (Figure 2.6-1). All of the locations identified for these areas appear to have well-maintained access roads and should be accessible for the delivery and staging of materials, equipment, and personnel. As described for the proposed Project, improvements at each of the staging and landing areas would be required and would include clearing of vegetation, and potential grading and cut and fill activities. The removal of pine trees, oaks, and possibly other trees of various age classes would be necessary in order to facilitate helicopter operations at several of the sites. Four of the helicopter staging areas identified for this alternative are the same as sites identified for the proposed Project. See the *TRTP Biological Resources Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~) for complete descriptions of each site.

As described for the proposed Project, due to the weight capacities and fuel limitations for the helicopters that would be used under this alternative, it is assumed that only those tower locations within an approximate 2.5-mile radius of the staging areas were considered viable candidates for helicopter construction. For the purpose of obtaining a maximum number of tower locations subject to helicopter construction, all of the tower locations that occur within the 2.5-mile radius of each staging area were assumed to require helicopter construction. As a result of this alternative, the construction and/or improvements to some access and most spur roads associated with these tower locations that would be required under SCE's proposed Project (Alternative 2) would not occur. Table 3.4-14 lists the habitats occurring in the Alternative 6 Project area in the Central Region.

Table 3.4-14. Vegetation Types Occurring in Alternative 6

Habitat Type	Acres	Percentage of Total Acreage
Mixed Chaparral	3065.57	47.30%
Barren/Developed	629.81	9.72%
Canyon Oak Forest	538.44	8.31%
Bigcone Douglas Fir-Canyon Oak Forest	509.46	7.86%
Chamise Chaparral	376.18	5.80%
Deerweed and Chia Herbaceous Field (Recently Burned)	271.35	4.19%
Mojavean Juniper and Pinyon Woodland (Recently Burned)	211.91	3.27%
Scrub Oak Chaparral	188.02	2.90%
Coulter Pine Forest	113.04	1.74%
Interior Live Oak Scrub	107.99	1.67%
Coast Live Oak Woodland	98.37	1.52%
Mojave Pinyon Woodland	60.82	0.94%
Coastal Sage Scrub	54.23	0.84%
Southern Sycamore Alder Riparian Woodland	47.87	0.74%
Southern Coast Live Oak Riparian Forest	43.39	0.67%
Mojave Juniper Woodland and Scrub	33.25	0.51%
Southern Willow Scrub	28.14	0.43%
Nonnative Woodland	18.26	0.28%
California Annual Grassland	15.61	0.24%
Southern Cottonwood Willow Riparian Forest	11.01	0.17%
Recently Burned, Early Successional	10.06	0.16%
California Bay Forest	9.96	0.15%
Big Sagebrush Scrub	9.93	0.15%

Table 3.4-14. Vegetation Types Occurring in Alternative 6		
Habitat Type	Acres	Percentage of Total Acreage
Desert Wash	9.17	0.14%
Southern Arroyo Willow Riparian Forest	5.44	0.08%
Recently Burned Mojavean Juniper and Pinyon Woodland	4.19	0.06%
Sparsely Vegetated Streambed	3.07	0.05%
Yellow Pine Forest (Plantation)	2.73	0.04%
Water	2.36	0.04%
Ruderal Grassland	0.88	0.01%
Mule Fat Scrub	0.58	0.01%
Interior Live Oak Forest	0.02	0.00%
Total	6481.10	100.00%

3.4.2.8 Alternative 7: 66-kV Subtransmission Alternative

As described in Section 2.7, this alternative is comprised of ~~three~~ four 66-kV subtransmission line elements. The first element is the undergrounding of the 66-kV subtransmission line in Segment 7 through the River Commons or Duck Farm Project between S7 MP 8.9 and 9.9. The second element of this alternative includes the rerouting and undergrounding of the 66-kV subtransmission line around Whittier Narrows Recreation Area in Segment 7 between S7 MP 11.4 and 12.025. This element was developed as habitat enhancement for the least Bell's vireo. The third element consists of rerouting the existing 66-kV subtransmission line through the Whittier Narrows Recreation Area in Segment 7 (S7 MP 12.0 to 13.6) immediately north of the existing 220-kV ROW to reduce the number of structures required (20-foot expanded ROW required). The fourth element consists of rerouting the 66-kV subtransmission line around the Whittier Narrows Recreation Area in Segment 8A between the San Gabriel Junction at S8A MP 2.2 and S8A MP 3.8. This element was also developed as habitat enhancement for the least Bell's vireo. This element includes two options. For Option 1, the 66-kV lines would continue for approximately 700 feet southeast across Durfee Avenue and then continue approximately 2,100 feet southeast along Siphon Road to the San Gabriel River. New ROW, approximately 1,600-feet long and 60-feet wide, would be required to cross from the existing 66-kV ROW on the west side of the San Gabriel River to the existing 220-kV ROW located on the east side of the San Gabriel River, thereby allowing the new 66-kV lines to tie back into the 66-kV lines within the Project ROW. In Segment 8A, the two 66-kV lines would transition within the existing ROW to underground for approximately 200 feet across the width of the ROW from the south side and then rise up on the north side of the ROW to join the existing lines.

For Option 2, the 66-kV lines would continue west along the north side of Durfee Avenue for approximately 1,700 feet, re-entering the existing 220-kV ROW at approximately S8A MP 3.2. The 66-kV lines would continue southeast along the south side of the existing 220-kV ROW up to the east side of the San Gabriel River. A 20-foot expansion of the existing ROW between S8A MP 3.2 and 3.8 would be required to provide adequate clearance for conductor sway between the 66-kV lines and the new double-circuit 500-kV structures within the ROW and allow for one-of-one placement of the 66-kV TSPs alongside the new double-circuit 500-kV structures. Option 2 would result in fewer 66-kV structures within the existing 220-kV ROW than Alternative 2.

The portion of Segment 7 that would be re-routed underground through the Duck Farm Project for Alternative 7 is primarily located within barren/developed areas and ruderal grassland. As this portion of the alternative would occur along the exact same alignment as the proposed Project and traverse identical habitats, no new biological resources would be introduced. The portion of Segment 7 that would be re-routed underground around the Whittier Narrows Recreation Area for Alternative 7 is primarily located

within developed areas of the City of South El Monte. Habitat on either side of this underground segment is characterized as barren/developed and non-native woodland. The portion of Segment 8A that would be re-routed aboveground around the Whittier Narrows Recreation Area for Alternative 7 is primarily located within riparian vegetation that has a high weed component. Land use on either side of this aboveground segment is characterized as barren/developed along the western portion of the re-route and open space in the eastern portion of the re-route. Habitats within the re-routed portions of Alternative 7 outside of the existing 220-kV ROW are listed in Table 3.4-15 below. Acres impacted by this alternative are unknown at this time as final engineering has not been completed.

The Affected Environment along the rest of the Alternative 7 route in the Southern Region is identical to the proposed Project. The Northern and Central Regions would also be identical to the proposed Project.

Table 3.4-15. Vegetation Types Occurring in the Alternative 7 Re-Routes

Habitat Type	Acres	Percentage of Total Acreage
Barren/Developed	141.58	28.18%
Mule Fat Scrub	82.81	16.49%
Ruderal Grassland	80.89	16.10%
Southern Sycamore Alder Riparian Woodland	37.31	7.43%
Nonnative Woodland	23.94	4.77%
Southern Cottonwood Willow Riparian Forest	20.97	4.17%
Water	19.98	3.98%
Agriculture	17.66	3.52%
Southern Willow Scrub	16.69	3.32%
Coastal Sage Scrub	14.90	2.97%
Southern Arroyo Willow Riparian Forest	14.03	2.79%
Exotic – Giant Reed	13.93	2.77%
Mixed Chaparral	4.52	0.90%
Sparsely Vegetated Streambed	4.43	0.88%
Freshwater Marsh	2.90	0.58%
Southern Coast Live Oak Riparian Forest	2.73	0.54%
Landscaped Park	1.63	0.32%
Ruderal Wetland	1.30	0.26%
Coast Live Oak Woodland	0.125	0.02%
Total	502.33	100%

3.4.3 Applicable Laws, Regulations, and Standards

Federal and state endangered species legislation gives special status to a number of habitats and plant and animal species known to occur within the proposed Project. In addition, state resource agencies and professional organizations, whose lists are recognized by agencies when reviewing environmental documents, have identified additional species occurring within the proposed Project. Such species are referred to collectively as "species of special status" and include habitats, plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered under the federal Endangered Species Act (ESA) or the California Endangered Species Act (CESA); animals listed as "fully protected" under the California Fish and Game Code; animals designated as "Species of Special Concern" by the California Department of Fish and Game (CDFG); and plants listed as rare or endangered by the California Native Plant Society (CNPS) in the *Inventory of Rare and Endangered Plants of California* (CNPS 2007).

3.4.3.1 Federal

Federal Endangered Species Act provisions protect federally listed threatened and endangered species and their habitats from unlawful take and ensure that federal actions do not jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Under the ESA, "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any of the specifically enumerated conduct." The U.S. Fish & Wildlife Service's (FWS) regulations define harm to mean "an act which actually kills or injures wildlife." Such an act "may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR § 17.3). Critical habitat is defined in Section 3(5)(A) of the ESA as "(i) the specific areas within the geographical area occupied by the species on which are found those physical or biological features (I) essential to the conservation of the species, and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species upon a determination by the Secretary of Commerce or the Secretary of the Interior (Secretary) that such areas are essential for the conservation of the species." The effects analyses for designated critical habitat must consider the role of the critical habitat in both the continued survival and the eventual recovery (i.e., the conservation) of the species in question, consistent with the recent Ninth Circuit judicial opinion, *Gifford Pinchot Task Force* v. *United States Fish and Wildlife Service*. Activities that may result in "take" of individuals are regulated by the FWS. The FWS produced an updated list of candidate species December 6, 2007 (72 FR 69034). Candidate species are not afforded any legal protection under ESA; however, candidate species typically receive special attention from federal and state agencies during the environmental review process. In compliance with the requirements of the ESA, the USDA Forest Service has initiated informal consultation with the USFWS regarding the effects of the Project on threatened, endangered, and candidate species that occur or could occur in the Project area. Formal consultation will begin in summer 2009. As part of consultation with USFWS, the USDA Forest Service has prepared and will submit a Biological Assessment (BA) for federally endangered or threatened species that could potentially be adversely affected by the proposed Project. Subsequently, any "take" of a federally endangered or threatened species as a result of implementation of the proposed Project would only be allowed under the context of a Biological Opinion (BO) issued by USFWS.

Raptors (e.g., eagles, hawks, and owls) and their nests are protected under both federal and state regulations. The federal Migratory Bird Treaty Act[1] (MBTA) prohibits killing, possessing, or trading in migratory birds except in accordance with regulations prescribed by the Secretary. This act encompasses whole birds, parts of birds, and bird nests and eggs. Mitigation proposed for the Project, including clearing vegetation outside of the breeding season, pre-construction nest surveys, disturbance-free buffers, and construction monitoring would ensure the proposed Project remains in compliance with the MBTA. In addition, SCE would construct the line in compliance with Avian Power Line Interaction Committee (APLIC) standards to minimize potential for birds to collide or be electrocuted during operation of the TRTP.

The Bald Eagle Protection Act of 1940 (16 U.S.C. 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this Act. Take of bald and golden eagles is defined as follows: "disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific

[1] 16 U.S.C., Sec. 703, Supp. I, 1989.

information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.'' (72 FR 31132; 50 CFR 22.3). Mitigation measures, including clearing vegetation outside of the breeding season, pre-construction nest surveys, disturbance-free buffers, and construction monitoring, would ensure that no take of bald or golden eagles occurs as a result of the implementation of this Project. In addition, SCE would construct the TRTP in compliance with APLIC standards to minimize the potential for line strikes and electrocutions.

3.4.3.1.1 Regulated Habitats

Areas meeting the regulatory definition of "Waters of the U.S." (jurisdictional waters) are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) under provisions of Section 404 of the Clean Water Act (1972) and Section 10 of the Rivers and Harbors Act (1899). These waters may include all waters used, or potentially used, for interstate commerce, including all waters subject to the ebb and flow of the tide, all interstate waters, all other waters (intrastate lakes, rivers, streams, mudflats, sandflats, playa lakes, natural ponds, etc.), all impoundments of waters otherwise defined as "Waters of the U.S.," tributaries of waters otherwise defined as "Waters of the U.S.," the territorial seas, and wetlands (termed Special Aquatic Sites) adjacent to "Waters of the U.S." (33 CFR, Part 328, Section 328.3). Wetlands on non-agricultural lands are identified using the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987). The TRTP alignment falls within the South Pacific Division of the USACE, and is under the jurisdiction of the Los Angeles District.

Construction activities within jurisdictional waters are regulated by the USACE. The placement of fill into such waters must comply with permit requirements of the USACE. No USACE permit would be effective in the absence of state water quality certification pursuant to Section 401 of the Clean Water Act.

3.4.3.1.2 Land Management Plan: Southern California National Forests

The Land Management Plan for the Angeles National Forest (USDA 2005; R5-MB-076) includes a strategy to successfully meet the goals of the vision for the National Forests with design criteria detailed to manage the ANF. Primarily, goals relate to the long-term sustainability of social, economic, and ecological objectives of the forest. It details suitable uses (in designated areas) for land divisions of the forest. In particular, major utility corridors are rated as suitable in developed area interfaces, back country, and back country motorized (use restricted areas) and not in back country non-motorized, critical biological, wilderness, or experimental forest areas. It also describes 12 designated utility corridors, including Interstate 5 (Tejon Pass), Old Ridge Route, Saugus/Mesa, Saugus/Del Sur, Ranaldi Dept Water Power, Gorge Ranaldi, BPL, Vincent Gould, Vincent Rio Hondo, 3-P Line, Midway Vincent, and Vincent Pardee (Table 484).

Many of the management tools and goals described in the plan are linked to National Strategic Plans for National Forests. For example, Invasive Species Prevention and Control (Goal IS 1) is linked to Goal 2 (Reduce the impacts from invasive species) objective 1. ~~Three~~ Seven goals apply to the proposed Project:

- IS 1 - Invasive Species Prevention and Control: Prevent the introduction of new invaders, conduct early treatment of new infestations, and contain and control established infestations (Linked to National Strategic Plan Goal 2 [Reduce the impacts from invasive species] objective 1).
- FH 1 - Vegetation Restoration: Restore vegetation through reforestation or other appropriate methods after stand replacing fires, drought, or other events or activities that degrade or cause a loss of plant communities (Linked to National Strategic Plan Goal~~d~~ 5 [Improve watershed condition] objective 3).

- Lands 2 - Non-recreation Special Use Authorizations: Where overhead transmission lines occur in California Condor habitat, work with utility companies or authorization holders to install high-visibility or avoidance devices and raptor guards on poles and other structures potentially used as perching sites by California Condors. Also, use signing, barriers, or other suitable measures to protect threatened, endangered, proposed, candidate, and sensitive species key and occupied habitats within special-use authorization areas.
- WL 1 - Threatened, Endangered, Proposed, Candidate, and Sensitive Species Management: Manage habitat to move listed species toward recovery and de-listing. Prevent listing of proposed and sensitive species (Linked to National Strategic Plan Goal 5 [Improve watershed condition] objective 3 and National Strategic Plan Goal 6 [Mission related work in addition to that which supports the agency goals] objective 3).
- WL 2 - Management of Species of Concern: Maintain and improve habitat for fish, wildlife, and plants, including those with the following designations: game species, harvest species, management indicator species, and watch list species (Linked to National Strategic Plan Goal 5 [Improve watershed condition] objectives 1 and 3, and National Strategic Plan Goal 6 [Mission related work in addition to that which supports the agency goals] objectives 1, 3, and 5).
- WAT 1 – Watershed Function: Protect, maintain, and restore natural watershed functions including slope processes, surface water and groundwater flow and retention, and riparian area sustainability (Linked to National Strategic Plan Goal 5 [Improve watershed condition] objectives 1, 2, and 3).
- WAT 2 – Water Management: Manage groundwater and surface water to maintain or improve water quantity and quality in ways that minimize adverse effects (Linked to National Strategic Plan Goal 5 [Improve watershed condition] objective 1).

Extensive guidance is also given for a range of conservation measures that be applied to avoid, minimize, or mitigate negative, long-term effects on threatened, endangered, proposed, candidate, or FS Sensitive species and habitats. Sensitive species are defined as "a plant or animal species identified by a Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density or in habitat capability that would reduce a species' existing distribution. Sensitive species are not covered under the Endangered Species Act." Also identified are FS Watch List species, which are plant species that require additional consideration but do not warrant FS Sensitive status. Guidance includes the protection of known raptor nests; protection of all spotted owl territories; allowance for movement along corridors; use of seasonal closures to protect special-status species; avoidance of collection of forest products; and avoidance of activities that result in the removal, crushing, burying, burning, or mowing of host plants within critical and occupied habitat for special-status butterfly species, among others. The Land Management Plan also lists relevant laws, regulations, agreements, and other management direction outside of the scope of the proposed Project (Appendix A of the Land Management Plan).

3.4.3.2 State

Provisions of CESA protect state-listed threatened and endangered species. The CDFG regulates activities that may result in "take" of individuals (i.e., "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill"). Habitat degradation or modification is not expressly included in the definition of "take" under the California Fish and Game Code. Additionally, the California Fish and Game Code contains lists of vertebrate species designated as "fully protected" (California Fish & Game Code §§ 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], 5515 [fish]). Such species may not be taken or possessed.

In addition to federal and state-listed species, the CDFG also has produced a list of Species of Special Concern to serve as a "watch list." Species on this list are of limited distribution or the extent of their habitats has been reduced substantially, such that threat to their populations may be imminent. Species of Special Concern may receive special attention during environmental review, but they do not have

statutory protection. The FWS also uses the label, "Species of Concern," as an informal term that refers to those species that might be in need of concentrated conservation actions. Species of Concern receive no legal protection as a result of their designation, and the use of the term does not necessarily mean that the species would eventually be proposed for listing as a threatened or endangered species.

Birds of prey are protected in California under the State Fish and Game Code.[2] Section 3503.5 states it is "unlawful to take, possess, or destroy any birds of prey (in the order Falconiformes or Strigiformes) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this Code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "take" by the CDFG. Under Sections 3503 and 3503.5 of the State Fish and Game Code, activities that would result in the taking, possessing, or destroying of any birds-of-prey, taking or possessing of any migratory non-game bird as designated in the Migratory Bird Treaty Act, or the taking, possessing, or needlessly destroying of the nest or eggs of any raptors or non-game birds protected by the Migratory Bird Treaty Act, or the taking of any non-game bird pursuant to Fish and Game Code Section 3800 are prohibited.

Vascular plants listed as rare or endangered by the CNPS, but which might not have designated status under state endangered species legislation, are defined as follows:

- List 1A - Plants considered by the CNPS to be extinct in California
- List 1B - Plants rare, threatened, or endangered in California and elsewhere
- List 2 - Plants rare, threatened, or endangered in California, but more numerous elsewhere
- List 3 - Plants about which we need more information – a review list
- List 4 - Plants of limited distribution – a watch list

3.4.3.2.1 Regulated Habitats

The State Water Resources Control Board is the state agency (together with the Regional Water Quality Control Boards [RWQCB]) charged with implementing water quality certification in California. The TRTP alignment falls under the jurisdiction of the Los Angeles (Region 4) RWQCB, the Santa Ana (Region 8) RWQCB, and the Lahonton (Region 6) RWQCB. The Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (1995), the Santa Ana River Basin Water Quality Control Plan (updated 2008), and the Water Quality Control Plan for the Lahontan Region (2005) were reviewed to determine specific policies of each RWQCB relevant to the Project. No policies specific to the Project were described, although Best Management Practices (BMPs) for construction, as incorporated into the Project (see below), and the need for a Streambed Alteration Agreement from the CDFG are discussed. In addition, all plans express an objective for the protection of existing wetland habitat and other special aquatic sites with their associated populations of wetland flora and fauna.

The CDFG potentially extends the definition of stream to include "intermittent and ephemeral streams, rivers, creeks, dry washes, sloughs, blue-line streams (USGS), and watercourses with subsurface flows. Canals, aqueducts, irrigation ditches, and other means of water conveyance can also be considered streams if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife" (CDFG, 1994a). Such areas of the proposed Project were determined using methodology described in *A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600-1607* (CDFG, 1994a).

[2] Section 3503.5, 1992.

Activities that result in the diversion or obstruction of the natural flow of a stream; or which substantially change its bed, channel, or bank; or which utilize any materials (including vegetation) from the streambed, may require that the Project applicant enter into a Streambed Alteration Agreement with the CDFG.

3.4.3.2.2 California Department of Parks and Recreation

The California State Park System encompasses nearly 1.5 million acres in more than 270 "park units" throughout the State, including, but not limited to, habitat reserves and preserves, developed and undeveloped recreational parks, wilderness areas, cultural reserves and preserves, off-highway vehicle parks, and historic parks. For the purposes of lands managed by California State Parks, the State is divided into 12 park "units," of which the Biological Resources Study Area includes the Los Angeles County Unit and portions of the Central Valley and Inland Empire Units (California Department of Parks and Recreation, 2007). The proposed Project does not traverse lands under the jurisdiction of the California Department of Parks and Recreation. However, a portion of the existing Antelope Valley California Poppy Reserve, which is under the jurisdiction of California Department of Parks and Recreation, is located within its Los Angeles County Unit, is within one-half mile of the proposed Segment 4 at MP 12.9.

All routes associated with Alternative 4 (the Chino Hills Route Alternative) would affect lands within Chino Hills State Park (Park or CHSP). The CHSP General Plan (General Plan) was adopted in February 1999 (California Department of Parks and Recreation, 1999). The General Plan provides parkwide management goals and guidelines developed for managing natural resources. Goals and guidelines for natural resources are directed towards four broad issue areas relevant to CHSP, including: (1) protecting biocorridors and facilitating the movement of animals and dispersal of plant seed within CHSP, and between the park and other wildland areas; (2) establishing, maintaining, and protecting buffers adjacent to CHSP; (3) restoring and protecting the native vegetation within CHSP through active resource management programs; and, (4) protecting, perpetuating, and restoring native wildlife populations and native aquatic species at CHSP (California Department of Parks and Recreation, 1999).

3.4.3.2.2 Food and Agricultural Code Division 23: California Desert Native Plants Act

The California Desert Native Plants Act protects California desert native plants from unlawful harvesting on both public and privately owned lands within Imperial, Inyo, Kern, Los Angeles, Mono, Riverside, San Bernardino, and San Diego counties. The following native plants, or any part thereof, may not be harvested except under a permit issued by the commissioner or the sheriff of the county in which the native plants are growing: all species of the family Agavaceae (century plants, nolinas, yuccas); all species of the family Cactaceae; all species of the family Fouquieriaceae (ocotillo, candlewood); all species of the genus *Prosopis* (mesquites); all species of the genus *Cercidium* (palos verdes); and *Acacia greggii* (catclaw), *Atriplex hymenelytra* (desert-holly), *Dalea spinosa* (smoke tree), and *Olneya tesota* (desert ironwood, both dead and alive) (provision 80073). This provision excludes any plant that is declared to be a rare, endangered, or threatened species by federal or state law or regulations, including, but not limited to, the Fish and Game Code. The fee for the permit to remove any of these plants will not be less than $1 per plant, except for Joshua tree (*Yucca brevifolia*), which will not be less than $2 per plant. Implementation of the California Desert Native Plants Act, however, provides a specific exemption for utilities carrying out a public service. The Act does not apply to a public agency or to a publicly or privately owned public utility when acting in the performance of its obligation to provide service to the public (Food and Agricultural Code Division 23: California Desert Native Plants Act. Section 80117).

3.4.3.3 Local Policies and Habitat Conservation Plans

3.4.3.3.1 West Mojave Plan

The West Mojave Plan (WMP) is "a habitat conservation plan and federal land use plan amendment that (1) presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel (MGS) and nearly 100 other plants and animals and the natural communities of which they are part, and (2) provides a streamlined program for complying with the requirements of the California and federal Endangered Species Acts" (BLM, 2005). The 9,359,070-acre planning area includes 3,263,874 acres of Bureau of Land Management (BLM) administered public lands; 3,029,230 acres of private lands; and 102,168 acres of lands administered by the State of California within portions of Inyo, Kern, Los Angeles, and San Bernardino counties.

The BLM issued a Record of Decision (ROD) based on the WMP Environmental Impact Report (EIR). However, the ROD addressed only BLM's amendment of the California Desert Conservation Area (CDCA) Plan, and it did not include actions proposed by State and local governments for non-federal lands, except when specifically identified (BLM, 2006). The habitat conservation plan has not been completed and would require greater specificity for local governments to obtain incidental take permits under the State and Federal endangered species acts (BLM, 2006).

3.4.3.3.2 South Coast Resource Management Plan

The South Coast Resource Management Plan (RMP) and ROD (1994) is a "management plan for the approximately 296,000 acres of BLM-administered land and 167,000 acres of federal mineral ownership where the surface is privately owned over a 5-county area in 296 separate parcels." Development of this RMP fulfills the mandate of Section 202 of the Federal Land Policy and Management Act of 1976. This plan covers portions of San Diego, Riverside, San Bernardino, Los Angeles, and Orange counties, including the Beauty Mountain management area. These lands have value for watershed and wildlife use as well as recreational use.

The RMP considered 4 alternatives for management of the area, and continuation of the present management was selected as the preferred alternative for the Los Angeles-Orange County Management Area. Several utility corridors (specifically electric) occur within the Los Angeles-Orange County Management Area. The relevant policy and specific actions included in the RMP are as follows:

- All land use proposals will be evaluated for conformance with plan objectives and land use allocation (Chapter 2, #11, p. 14).
- Unique, natural plant communities should be managed to prevent further "urban and industrial development through conversion to agriculture or road construction." These include coastal sage scrub, Riversidean sage scrub, south coast live oak riparian forest, southern cottonwood-willow riparian forest, southern sycamore-alder riparian forest, southern willow scrub, or Engelman oak woodland (Chapter 2; Appendix B, p. 87).
- Measures for minimizing accelerated soil erosion will continue to be made on a site-specific basis through evaluation of management actions (Chapter 2, #19, p. 15).
- Management actions will conform to visual resource management Class 3 Objectives (Chapter 2, # 7, p. 45).

3.4.3.3.3 Southern California Association of Governments

The Southern California Association of Governments (SCAG) is the designated Metropolitan Planning Organization that develops the Regional Comprehensive Plan and Guide (RCPG) for growth management. The RCPG is currently being updated, with drafts dated 2008 available for review. Sections of the RCPG that pertain to the TRTP are the Growth Management (will be the Land Use and Housing Section) and the

Open Space and Conservation (non-mandated) section (will be Open Space and Habitat Section). In addition, the SCAG develops a State of the Region report yearly to guide local policy.

3.4.3.3.4 Los Angeles County Draft General Plan

The Los Angeles County Draft General Plan (2008a) is an update of efforts begun in 1970 to formalize a development plan (adopted in 1980). It is the outline for growth and development in the unincorporated areas of Los Angeles County within the next 20 years that guides land use decisions. One of the 10 community priorities described in the plan is the protection of the natural environment, natural resources, and open spaces (Community Priority # 9, Goal C/OS-5). The Significant Ecological Area (SEA) designation provides an additional level of environmental review; any development within SEAs (described below) require a SEA-Conditional Use Permit, unless exempt[3]. Currently proposed SEAs near the Project alignment include Antelope Valley, Santa Clara River, San Gabriel Canyon, Puente Hills, and Rio Hondo Wildlife Sanctuary. These SEA areas replace previously described SEA areas. Other than SEAs, other Special Management Areas include open space areas, hillside management areas, agricultural opportunity areas, and National Forests. Within the National Forests, development is not encouraged because "development requires the removal of forest vegetation around structures for fire protection, erosion from hillside development may occur, and the mountainous terrain subjects structures to potential landslides due to seismic activity." In addition, the Land Use Element of the General Plan requires development and infrastructure projects to preserve, to the best extent possible, major drainage features, riparian vegetation, rock outcroppings, and stands of other native trees. Productive farmland is also protected within Los Angeles County for local food production, open space, public health, and the local economy (Goal C/OS-6). With regards to energy sources, Los Angeles County has set policies to expand the production and use of alternative energy resources while maximizing energy conservation (Goal C/0S-9 and 10). In addition, the Los Angeles County Zoning Code references, in detail, policies described in the General Plan, such as the Oak Tree and Brushing Ordinances, described below.

Other than the Antelope Valley Areawide Area Plan, the General Plan describes three Community and Neighborhood Plans applicable to the Project: the Hacienda Heights Community Plan (1978), the Rowland Heights Community Plan (1981), and the Altadena Community Plan (1986). Six additional Community General Plans are described below: City of La Cañada Flintridge General Plan (1993), City of Rosemead General Plan (2008), City of Duarte Comprehensive General Plan (2005 to 2020) Preliminary Draft (2006), The City of Pasadena Comprehensive General Plan (2004), City of Baldwin Park 2020 General Plan (2002), and the Comprehensive General Plan of the City of San Gabriel, California (2004). Several communities did not have General Plans readily available, as they are currently being developed or updated, including Temple City, El Monte, South El Monte, Chino Hills/Los Serranos, and Chino. Policies described in the General Plan are typically put into practice through City Planning Ordinances.

County of Los Angeles Oak Tree and Brushing Ordinances

The County of Los Angeles General Plan (CLAGP) directs the protection of native oaks within developed portions of Los Angeles County, especially on steeper slopes (>25%). Section 22.56 of the County

[3] The CPUC has preemptive jurisdiction over construction, maintenance, and operation of public utilities in California (CPUC's General Order Number 131-D) and the Forest Service has preemptive jurisdiction for the Project within National Forest lands. Therefore, no local discretionary permits (e.g. Conditional Use Permits or Specific Plan approval) or local plan consistency evaluation is required for the proposed Project or the Project alternatives. However, SCE would be required to obtain all ministerial building and encroachment permits from local jurisdictions (counties and incorporated cities).

Zoning Code (Part 16) requires that any native oak more than 8 inches in diameter at breast height (dbh) or 25 inches or greater in circumference not be damaged, removed, or encroached on (within 5 feet of the drip line or 15 feet from the trunk). Oak species covered by the ordinance include coast live oak (*Quercus agrifolia*), valley oak (*Quercus lobata*), California black oak (*Quercus kelloggii*), Engelmann oak (*Quercus engelmannii*), Canyon oak (*Quercus chrysolepis*), Nuttall's scrub oak (*Quercus dumosa*), and oak species of cultural significance. A county permit is required to remove oaks, and permits must be accompanied by a county oak tree report. Removed oak trees must be replaced at a ratio of 2:1 (using 15-gallon oaks of the same species, or greater, as determined by the hearing officer), maintained for 2 years, and replaced if mortality occurs (Section 22.56.2180). When replacement or relocation of the proposed Project site is inappropriate, the applicant may request to mitigate for tree removal by payment into the oak forests special fund to plant new oak trees on public lands, maintain existing oak trees on public lands, purchase prime oak woodlands, and purchase oaks of significant cultural value. Oak trees must be protected during development projects with the installation of chain link fence (4-foot height) around the protection zone of trees prior to project initiation. Projects involving grading within the protected zone of a native oak must be supervised by an individual with special expertise with oak tree management and reporting within Los Angeles County. Excavation within the protected zone must be limited to hand tools or small hand-power equipment. Utility trenching should avoid encroaching into the protected zone.

The County Zoning Code Section 12.28 Brushing Ordinance requires a permit for the removal or destruction of natural vegetation on terrain with 8 percent slope or greater. The County of Los Angeles may issue permits for vegetation removal in these areas, and requests must include a description of the property; details of proposed management practices and equipment used to prevent erosion; and a map displaying topography, drainages, and the proposed Project area. Conditions may be outlined for the permit, including seasonal limitations in vegetation removal, requirements for erosion control devices, and restoration of native vegetation in impacted areas.

County of Los Angeles Significant Ecological Areas

Significant Ecological Areas are specified by the CLAGP as "ecologically important land and water systems that are valuable as plant or animal communities, often important to the preservation of threatened and endangered species, and conservation of biological diversity within the County." There are a total of 31 existing and proposed SEAs within Los Angeles County and a total of 6 SEAs that overlap the Project area: Joshua Tree Woodlands, San Andreas Rift Zone, Santa Clara River, San Gabriel Canyon, Rio Hondo Wildlife Sanctuary, and Puente Hills SEA.

Project guidelines for the Joshua Tree Woodland SEA include the retention of Joshua Tree Woodland with adequate buffers to allow for the long-term viability and integrity of this rare plant community. Guidelines for the Puente Hills SEA require the retention of Southern Coast Live Oak Riparian Forest, California Walnut Woodland, Southern Willow Scrub, Coastal Sage Scrub, and Freshwater Marsh with adequate buffers to allow for the long-term viability and integrity of these rare plant communities. Other guidelines for the Puente Hills SEA include the retention of connectivity between major canyons, ranges (Puente and Chino Hills), and habitat patches that are fragmented by roads, freeways, and other barriers. In addition, any loss of small and/or isolated habitat patches within the SEA must be mitigated through on-site restoration and revegetation efforts, in order to "prevent a cumulative net loss in the functions and values of these habitats within any one of the Puente Hills SEA habitat units" (County of Los Angeles, 2007a).

The San Gabriel Canyon SEA requires protection of habitat for core populations of San Gabriel bedstraw and San Gabriel Mountains dudleya. Additionally, guidelines for this SEA require the retention of Southern Coast Live Oak Riparian Forest, Coast Live Oak Woodland, California Walnut Woodland, Southern Willow Scrub, Coastal Sage Scrub, and Riversidean Alluvial Fan Sage Scrub with adequate buffers to allow for the long-term viability and integrity of these rare plant communities. The Santa Clara River SEA requires the limitation of development outside existing floodplain margins; retention of connectivity of the Santa Clara River and its major tributaries; maintenance of habitat with adequate buffers for unarmored three-spined stickleback, California red-legged frog, and slender-horned spineflower; and retention of Southern Coast Live Oak Riparian Forest, Bunchgrass Grassland, Bigcone Douglas Fir-Canyon Oak Forest, Southern Willow Scrub, Southern Sycamore Alder Riparian Woodland, Southern Cottonwood Willow Riparian Forest, Freshwater Marsh, Riversidean Alluvial Fan Sage Scrub, and Vernal Pools with adequate buffers to allow for the long-term viability and integrity of these rare plant communities.

3.4.3.3.5 Hacienda Heights Community Plan

The Hacienda Heights Community General Plan (1978) is currently being updated to reflect changes in demographics and emerging needs in Hacienda Heights. Hacienda Heights is a residential community lying along the north slope of the Puente Hills. Policies described in the General Plan are typically put into practice through City Planning Ordinances. The major land use policies related to the Project include those under Policy 3: Permit interim use of a portion of the landfill area, subject to conditions of access or protection (these are covered, at least in part, in the Puente Hills Landfill Management Plan, described above). This plan mentions the Sycamore and Turnbull Canyon Area SEAs, described in the old Los Angeles County General Plan and incorporated into the newly proposed Puente Hills SEA. Policies pertaining to the preservation of natural resources related to the Project include the following:

- 3) In non-urban areas, preserve drainage courses in their natural state to the greatest extent possible.
- 4a and 4b) To preserve the SEA, will not allow the substantial deterioration of resources such as vegetation and wildlife, watershed, areas required for ecologic and/or scientific study purposes, and streams and will not significantly increase the risk of wildland fire.
- 5) Uses of land within the SEA are permitted, including utility easements.

3.4.3.3.6 Rowland Heights Community Plan

The Rowland Heights Community Plan (1981), while an element of the Los Angeles County General Plan, delineates more clearly, and in greater detail than is possible in the Countywide General Plan, policies and standards for development in Rowland Heights, located directly east of Hacienda Heights (described above). One of the key issues identified in the development of the plan is the preservation of the rural atmosphere of the community through the maintenance of the natural hillsides. Two of the main goals are to maintain the rural atmosphere of the community through the preservation of natural hillsides and vegetation and to preserve major ridgelines and riparian corridors. Over 4,000 acres of hillside land was vacant in 1981, some of which is operated by Shell Oil Company, and the other portion is included within the newly proposed Puente Hills SEA. Additional policies applicable to the Project include the following:

- 1) Preserve conservation and open space areas (utility easements are allowed)
- 5) Protect visual qualities of scenic areas including ridgelines and views from public roads and trails, particularly in the Brea Canyon Cut-off area
- 6) Require approval prior to disturbing any major stands of vegetation. Policies described in the General Plan are typically put into practice through City Planning Ordinances

- 7h) Preserve significant views from major existing residential areas and protect the visual quality of highly scenic areas
- 9) Obtain Regional Planning Commission approval of an environmental assessment before disturbing any major stands of vegetation; conservation and open space policies

3.4.3.3.7 Altadena Community Plan

The Altadena Community Plan (1986) is a replacement of the 1969 Community Plan. Altadena is located north of Pasadena adjacent to the ANF in the northwest portion of the San Gabriel Valley. The ANF represents slightly more than 8 percent of the area, vacant lands represent 10 percent of the area, and utilities comprise 3 percent of the area (the SCE 220-kV transmission right-of-way corridor in the San Gabriel Mountain foothills and existing transformer stations). The primary issue raised by this general plan (as most areas that are a part of the plan area that could be developed were already developed) is that existing overhead electrical and telephone lines conflict with the unique visual quality and backdrop of the San Gabriel Mountains. As such, one of the primary infrastructure goals is to encourage the installation of underground utilities and coordinate all County departments and private utilities. The other main, applicable issue described in the Community Plan is the proximity to the ANF and foothill areas that are dominated by thick vegetation and present a threat of frequent fire. Policies employed to limit fire dangers in the area include maintaining the current levels of fire protection, maintaining brush clearance standards, and to continue to develop recommendations for fire safety. Policies described in the General Plan are typically put into practice through City Planning Ordinances.

3.4.3.3.8 City of La Cañada Flintridge General Plan

The City of La Cañada Flintridge General Plan was adopted 15 November 1993 to develop policies to retain the community's natural and semi-rural nature. La Cañada Flintridge is located directly south of the ANF, north of Pasadena. Policies described in the General Plan are typically put into practice through City Planning Ordinances. There are roughly 800 acres of ANF land within City boundaries. Several goals of the plan apply to the proposed Project alignment:

- Goal 3A: Preserve and enhance, to the maximum extent possible, the natural and manmade scenic beauty of the community.
- Policy 3.2: Conduct appropriate environmental reviews for all projects affecting land use.
- Goal 4: Maintain hillside areas for the purpose of preserving the visual quality of the City, protecting the public from safety hazards, and conserving natural resources.
- Policy 4.7: In areas of hillside development, preserve ridgelines, natural slopes, and bluffs as open space, minimize erosion, and complement natural landforms through sensitive grading techniques.
- Conservation Policy 4.2: Major hillside viewscapes visible from points within the City should not be detrimentally altered by the intrusion of highly visible cut or fill slopes, building lines, and/or road surfaces.
- Vegetation Policy 4.14: The City may consider the adoption of a heritage tree ordinance for the purpose of identifying and preserving significant trees. (Note: the City Tree Ordinance protects native oaks, and deodar cedar, Chinese elm, and California pepper tree with trunks 12 inches or more in diameter, measured at 4 feet from the ground surface. A permit is required for their removal.).

3.4.3.3.9 City of Rosemead Draft General Plan

The City of Rosemead General Plan (2008) is designed to guide the City through the year 2025 by establishing goals and policies that address land use, circulation, economic development, safety, and open space. The City of Rosemead is located west of the City of El Monte in the San Gabriel Valley approximately 11 miles east of downtown Los Angeles. Several goals/policies in the General Plan are relevant to the proposed Project, including goals to provide high-quality parks, recreation, and open space

facilities. Zoning ordinances are not relevant to the proposed Project, except for the Oak Ordinance, described above.

3.4.3.3.10 City of Duarte Comprehensive General Plan (2005 to 2020) Preliminary Draft

The Duarte Preliminary General Plan (2006) was last updated in 1989 and will help direct decision making and policy implementation until 2020. The City of Duarte is located near the southern terminus of Segment 6. The City is divided into 3 main areas: the mountainous region of the San Gabriel Mountains within the ANF, the foothills of the San Gabriel Mountains, and the alluvial slopes of the mountains (where urban development is concentrated). Policies described in the General Plan are typically put into practice through City Planning Ordinances. Several policies included in the Preliminary General Plan apply to the proposed Project alignment:

- Conservation Objective 1: Preserve Duarte's natural hillsides which provide significant wildlife habitat, open space, aesthetic, and a visual backdrop to the community.
- Conservation Objective 5.1: Promote the preservation of open space by discouraging development that is not sensitive to this resource.
- Conservation Objective 6.1: Assure that development maintains the character of open space natural resources.

3.4.3.3.11 City of Pasadena Comprehensive General Plan

The City of Pasadena Comprehensive General Plan (2004) was last updated in 1994 to translate broad community values into specific strategies for growth. The Draft Green Space and Conservation Element was prepared in July 2007. Pasadena is located south of the ANF, southeast of Altadena. In addition to the General Plan, 7 Specific Plans were developed to outline development strategies for key areas within urban environment. Policies described in the General Plan are typically put into practice through City Planning Ordinances. Several policies outlined in the General Plan are applicable to the proposed Project:

- Objective 19: Protect and enhance areas of the City containing important biological resources; protect and minimize disturbance of any important paleontological and/or archaeological resources that might remain in the City.
- Policy 19.1: All project proponents proposing to develop within undeveloped areas shall conduct surveys according to applicable protocols in consultation with the appropriate trustee agencies (including, but not limited to, the FWS and CDFG) to determine if special-status species (including, but not limited to California gnatcatcher and least Bell's vireo) or potential habitat for special-status species (including, but not limited to, coastal sage scrub and Riversidean alluvial fan sage scrub) are present or are potentially present. If the surveys and/or consultation indicate that such species or habitat are present or potentially present, appropriate mitigation measures shall be required as conditions of project approval to minimize and/or offset the project's potential effects on those species and/or habitat.
- Policy 19.2: All project proponents proposing to develop within areas containing wetlands, riparian habitat, and/or jurisdictional waters of the U.S. or the State of California shall conduct surveys in consultation with appropriate trustee agencies (including, but not limited to, the USACE, FWS, CDFG, Los Angeles RWQCB). If the surveys and/or consultation indicate that wetlands, riparian habitat, and/or jurisdictional waters are present or potentially present, appropriate measures shall be required as conditions of project approval to minimize and/or offset the project's potential effects on those resources.
- Green Space Objective 1: Encourage and promote the stewardship of Pasadena's natural environment, including water conservation, clean air, natural open space protection, and recycling.
- Green Space Policy 1.3: Restore, enhance, and re-establish the historical native plant communities within identified critical open space areas to better support native wildlife habitat.
- Green Space Policy 1.5: Restore, protect, and enhance wildlife habitat within critical open space areas and any wildlife corridors and/or linkages.

- Green Space Objective 2: Recognize the importance to Pasadena of the history, cultural resources, and unique character of the Arroyo Seco (on the west side of Pasadena), and conserve and enhance these assets (further described in the Arroyo Seco Master Plans (2005).

3.4.3.3.12 City of Baldwin Park 2020 General Plan

The City of Baldwin Park 2020 General Plan (2002) was designed to develop a long-range plan which capitalizes on the community's physical, economic, and human resources for dealing with planning issues. Baldwin Park is located south of Duarte, south and east of the San Gabriel River. Several policies outlined within the General Plan are also covered under the City of Baldwin Park Zoning Ordinance. Although an approximately 3,000 feet length of the San Gabriel River runs through the Baldwin Park planning area, no open space/conservation measures are addressed in the General Plan and no Zoning Ordinance pertaining to the proposed Project exist.

3.4.3.3.13 Comprehensive General Plan of the City of San Gabriel, California

The Comprehensive General Plan of the City of San Gabriel, California (2004) is updated from the 1990 General Plan to develop methods to maintain a high quality of life. San Gabriel is located south of the City of San Marino and west of Temple City and Rosemead. The policies described in the General Plan are enforced through the Municipal Zoning Code. Policies in the General Plan applicable to the proposed Project include the following:

- Target 1.13.2: Fund and develop at least 2 major open space projects in conjunction with the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy.
- Action 7.1.1.2: Acquire small sites such as the Edison easements, cul-de-sacs, and street corners that can be assembled for future development of community gardens, neighborhood parks, skate parks, and recreational facilities.
- Target 8.5.3: Work with the San Gabriel Mountains and River Conservancy, and other interested agencies, to restore the San Gabriel River to a more environmentally healthy state.

3.4.3.3.14 Puente Hills Landfill Native Habitat Preservation Authority Resource Management Plan

The purpose of the Puente Hills Native Habitat Preservation Authority (Habitat Authority) is to acquire, restore, and maintain native habitat in the Puente Hills. The preserve consists of 3,860 acres west of Harbor Boulevard to Interstate 605 and State Route 60. This RMP provides a comprehensive, long-term management plan for the preserve with an adaptive management strategy. It identifies the main threats to the area as including habitat fragmentation, invasive plant species infestation, the "urban edge" effect (including light and noise pollution, exotic pests, feral pets, exotic plants, diseases, fire, and pollution), public use, and erosion. The RMP includes 7 goals pertaining to biological resources:

- Goal Bio-1: Acquire remaining open space that strengthens the ecological functioning of the preserve
- Goal Bio-2: Address risk of wildfires along the wildland urban interface
- Goal Bio-3. Maintain all populations of native plants and wildlife with special emphasis on management of locally uncommon, sensitive, federally-threatened, or endangered species and other sensitive resources (including protections for coastal sage scrub habitat for California gnatcatcher and other scrub species, protections for western spadefoot toad, protections for special-status plant species, protections for special-status raptor species, protections for Indicator Species in Los Angeles County, protections for native vegetation communities (particularly walnut woodland, oak woodland, coastal sage scrub, riparian communities, and native grassland), and the minimization of edge effects by the inclusion of an appropriate buffer in development
- Goal Bio-4. Enhance and restore degraded habitats in the preserve by increasing native vegetation, monitoring the spread or invasion of exotic species, and developing a long-term invasive, exotic plant management plan

- Goal Bio-5. Implement monitoring programs designed to identify ecosystem threats and guide adaptive management of the preserve by tracking the health, function, and integrity of habitats and ecological processes
- Goal Bio-6. Encourage university-level research to address unanswered, fundamental biological questions
- Goal Bio-7. Develop an in-house data storage and analysis system

3.4.3.3.15 Rio Hondo Watershed Management Plan

The purpose of the Rio Hondo Watershed Management Plan (2004) is to provide an organizing framework to improve water quality, health, habitat, and recreation potential of the Rio Hondo Watershed. Polluted run-off to the watershed has increased as impervious surfaces have reduced water percolation, and storm water run-off has adversely affected water quality. Two lower reaches of The Rio Hondo are designated as impaired water bodies. Six goals have been identified to create a healthy watershed with the idea that priority projects would address multiple goals simultaneously:

- Improve in-stream water quality to meet or exceed RWQCB standards and NPDES requirements by implementing a wide array of Stormwater Best Management Practices (BMPs)
- Create, enhance, and protect open space
- Improve habitat quality, quantity, and connectivity and combine existing habitat with the creation of new habitat to strengthen habitat migration corridors
- Improve recreational opportunities and use interpretative opportunities to enhance watershed awareness and identity
- Ensure that public health and safety are integrated into all aspects of watershed enhancement
- Maintain current, minimum flood protection levels and develop new flood protection strategies to meet the multiple goals required for watershed improvement

3.4.3.3.16 County of San Bernardino 2007 General Plan

The County of San Bernardino 2007 General Plan was adopted 13 March 2007. The previous General Plan was adopted in 1989. Policies stated in the General Plan are stated for all regions, or for the Valley, Mountain, or Desert Planning Region. The proposed Project alignment falls within the Valley Planning Region only. Goals relevant to the Project include the following:

- Goal Lu 7. The distribution of land uses will be consistent with the maintenance of environmental quality, conservation of natural resources, and the preservation of open spaces.
- Goal CI 13. The County will minimize impacts to stormwater quality and enhances environmental quality.
- Goal CI 18. The County will ensure efficient and cost effective utilities that serve the existing and future needs of people I the unincorporated areas are provided.
- Goal CO 1. The County will maintain to the greatest extent possible natural resources that contribute to the quality of life within the county.
- Goal CO 2. The County will maintain and enhance biological diversity and healthy ecosystems throughout the county.
- Goal CO 7. The County will minimize land use conflict between open spaces and surrounding land uses.

3.4.3.3.17 Antelope Valley Areawide General Plan

The Antelope Valley Areawide General Plan (1986) is one of three Area Plans adopted by the Los Angeles County General Plan and was last amended 27 July 1999. Those portions of the plan that pertain to the Project include the following:

- Designate significant plant and wildlife habitats in the Antelope Valley as “Significant Ecological Areas” (SEAs) and establish appropriate measures for their protection, including funding for acquisition and maintenance to promote and preserve biotic diversity (V-1, V-15)

- Minimize environmental degradation by enforcing controls on sources of pollution (including visual pollution) and noise (V-1)
- Preserve the Antelope Valley's SEAs in as viable and natural condition as possible, considering the addition of unique and rare habitat areas (V-16)
- Where a proposed discretionary application includes major riparian areas, assess the impact of the project on biotic resources and encourage project design which is sensitive to, and compatible with, the biotic resources present (V-16)
- Restrict use of off-road vehicles to public lands already disrupted by such uses or to lands exhibiting low environmental sensitivity
- Encourage uniform standards to grading practices on steep terrain

3.4.3.3.18 Lancaster General Plan

The City of Lancaster General Plan (City of Lancaster 1997) includes a policy and specific measures to reduce adverse impacts on biological resources and protect sensitive species. This policy is relevant to the Desert Wash and the Joshua Tree Woodland habitats within the proposed Project. The policy and specific actions included in the City of Lancaster General Plan relevant to the proposed Project are as follows:

- 3.4.1: Provide for the development of comprehensive management programs for significant biological resource areas remaining in the area. Specific actions under this policy provide for cooperating with federal, state, and local agencies in developing the West Mojave multi-species habitat conservation plan and initiating area wide studies under this plan to identify sensitive plants and animals within the study area.
- 3.4.2: Provide for the general protection of areas designated as Prime Desert Woodland.
- 3.4.3: Preserve significant desert wash areas to protect sensitive species that utilize these habitat areas. As part of specific environmental review, evaluate natural desert wash habitats that could be impacted by development to determine their potential to support special-status plant and wildlife species. Areas of desert wash habitat considered highly important for special-status species or that is occupied by these species shall be protected.

3.4.3.3.19 Palmdale Municipal Code

Joshua trees and juniper trees receive protection from the Palmdale Native Desert Vegetation Ordinance. Chapter 14.04 of the City of Palmdale Municipal Code (2007) requires a desert vegetation preservation plan with minimum preservation standards for removal of vegetation at sites with Joshua trees and other species included in the California Desert Native Plants Act, California Food and Agriculture Code, Division 23. However, utilities are exempt from the following provisions for actions taken to protect existing electrical power or communication lines or other property. This act requires permits from both Los Angeles and Kern counties for the removal of Joshua trees and other native vegetation. If on-site preservation is not feasible, in lieu, fees may fulfill this requirement. Conditions and measures anticipated to be included in the permit include, but are not limited to the following:

- A desert vegetation preservation plan prepared by a qualified biologist consisting of a written report and site plan depicting the location of each Joshua tree and, if determined necessary by the City of Palmdale, a long-term maintenance program for any Joshua trees left on site.
- Criteria for preservation of desert vegetation, the minimum standard for preservation being two Joshua trees per acre or as determined by the qualified biologist in accordance with the City of Palmdale. Joshua trees to be left on site shall be fenced off and left undisturbed during any grading activities or removed to a holding area until grading activities are completed. If two Joshua trees per acre cannot be preserved on site, the trees shall be transplanted to an off-site location by District No. 20 as approved by the City of Palmdale. Joshua trees may be transplanted to compensatory lands discussed in Measure 12-18. In lieu of transplantation of Joshua trees from areas to be developed, District No. 20 may satisfy the requirements of the City Code through payment of a fee to the City. At the City's discretion, compensatory mitigation for Joshua tree woodland included in Measure 12-18 may satisfy Measure12-16 if the City determines that these lands support adequate numbers of Joshua trees (Sanitation Districts of Los Angeles County 2005).

- Joshua trees preserved on site, in landscape easements, or landscape assessment districts are to be maintained in a healthy condition for a minimum of two growing seasons. The trees will be evaluated after one year by a qualified biologist. Trees determined to be failing or that have died will be replaced as determined by the City.

3.4.4 Impact Analysis Approach

3.4.4.1 Criteria for Determining Impact Significance

To satisfy CEQA requirements, conclusions are made regarding the significance of each identified impact that would result from the proposed Project and alternatives. Appropriate criteria have been identified and utilized to make these significance conclusions. The following significance criteria for biological resources were derived from previous environmental impact assessments and from the CEQA Guidelines (Appendix G, Environmental Checklist Form, Section IX). Impacts of the proposed Project or alternatives would be considered significant and would require mitigation if the Project would:

- Criterion BIO1: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or FWS.
- Criterion BIO2: Have an adverse effect, either directly or through habitat modifications, on any species listed as endangered, threatened, or proposed or critical habitat for these species.
- Criterion BIO3: Have a substantial adverse effect, either directly or through habitat modifications on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG, FS, or FWS.
- Criterion BIO4: Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Criterion BIO5: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Criterion BIO6: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances.
- Criterion BIO7: Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP.

Significance conclusions for individual impacts are not required for compliance with NEPA. Therefore, conclusions presented in the following analysis regarding the significance of identified impacts are provided for the purposes of CEQA only.

3.4.4.2 Applicant-Proposed Measures (APMs)

APMs were identified by SCE in the PEA. Table 3.4-16 presents the APMs that are relevant to the issue area of biological resources. APMs are a commitment by the Applicant (SCE) and are considered part of the proposed Project. Therefore, the following discussions of impact analysis assume that all APMs will be implemented as defined in the table. Additional mitigation measures are recommended in this section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

Table 3.4-16. Applicant-Proposed Measures – Biological Resources

APM BIO-1	Pre-construction biological clearance surveys would be performed to minimize impacts on special-status plants or wildlife species.
APM BIO-2	Every effort would be made to minimize vegetation removal and permanent loss at construction sites. If necessary, native vegetation would be flagged for protection. A project revegetation plan would be prepared for areas of native habitat temporarily affected during construction.

Table 3.4-16. Applicant-Proposed Measures – Biological Resources	
APM BIO-3	Construction crews would avoid affecting the streambeds and banks of any streams along the route to the extent feasible. If necessary, a Streambed Alteration Agreement (SAA) would be secured from California Department of Fish and Game. Impacts would be mitigated based on the terms of the SAA. No streams with flowing waters and or those capable of supporting special-status species would be expected to be adversely impacted from project implementation.
APM BIO-4	Construction and Operations Crews would be directed to use Best Management Practices (BMPs) where applicable. These measures would be identified prior to construction and incorporated into the construction and maintenance operations.
APM BIO-5	Biological monitors would be assigned to the project. The monitors would be responsible for ensuring that impacts to special-status species, native vegetation, wildlife habitat, or unique resources would be avoided to the fullest extent possible. Where appropriate, monitors would flag the boundaries of areas where activities need to be restricted to protect native plants and wildlife, or special-status species. These restricted areas would be monitored to ensure their protection during construction.
APM BIO-6	A Worker Environmental Awareness Program (WEAP) would be prepared and all construction crews and contractors would be required to participate in WEAP training prior to starting work on the project. The WEAP training would include a review of the special-status species and other sensitive resources that could exist in the Project area, the locations of the sensitive biological resources, their legal status and protections, and measures to be implemented for avoidance of these sensitive resources. A record of all personnel trained would be maintained.
APM BIO-7	Where significant and unavoidable impacts on any special-status resources cannot be avoided, SCE would conduct compensatory~~e~~ mitigation as determined by the regulatory agency.
APM BIO-8	SCE would conduct project-wide raptor surveys and remove trees, if necessary, outside of the nesting season (1 February – 31 August). If a tree or pole containing a raptor nest must be removed during the nesting season, or if work is scheduled to take place in close proximity to an active nest on an existing transmission tower or pole, SCE would coordinate with the CDFG and FWS and obtain written concurrence prior to moving the nest.
APM BIO-9	All transmission and sub-transmission towers and poles would be designed to be raptor-safe in accordance with the Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006 (Avian Power Line Interaction Committee [APLIC] 2006).

3.4.4.3 Impact Assessment Methodology

Consistent with the requirements of CEQA, NEPA, and Forest regulations, the significance of potential impacts is evaluated through the application of the significance criteria described above. The objective of the biological resources analysis is to identify potential adverse effects and/or significant impacts on biological resources. Avoidance is the preferred approach for management of biological resources. If impacts can be avoided through project design, establishment of exclusion zones, or other means, then specific mitigation measures may be unnecessary. However, appropriate mitigation measures to avoid or minimize impacts are identified, as appropriate, including procedures to be followed if significant biological resources are discovered during construction.

Special-Status Plant Impact Methodology

The methodology used to analyze and describe significance for special-status plant species is ~~entirely~~ based on the presence/absence of sensitive plant species detected within the project footprint or in adjacent habitat. Reconnaissance level surveys were completed in portions of the project alignment by SCE in 2007 and focused rare plant species surveys were conducted along the entire project alignment by SCE and Aspen in- 2008. Focused rare plant and weed surveys were conducted along all known access roads to the project alignment for Segment 6 on ANF lands in 2009 and are scheduled for completion in 2010 for Segment 11.~~a "habitat/vegetation type approach." Therefore, impacts to vegetation types mapped within the proposed Project were considered significant in the context of habitat capable of supporting special-status plants. Several vegetation types are considered rare and worthy of consideration by CDFG (2003, 2007) and/or are jurisdictional waters, and therefore impacts to these habitat types are considered significant in and of themselves (see Criterion BIO-1 and BIO-4). Finally, several vegetation types used~~

~~in the mapping and impacts analysis were either considered unlikely to provide suitable habitat for any special status plant species or were not possible or desirable to preserve through mitigation, and therefore in kind mitigation is not proposed for impacts to these types. These vegetation types are agricultural, barren/developed, exotic giant reed, nonnative woodland, and ruderal grassland. Impacts to special status plant species potentially occurring in these habitats are addressed under the other habitat types in which these species may occur.~~

~~As described above, the methodology used to analyze and describe significance for special status plant species is entirely based upon a "habitat or vegetation type approach." Because special status plant species may exist in more than one vegetation type, these species may be listed within multiple impact statements. However, when determining levels of significance for loss of habitat as habitat for special status plant species, impacts to each species were only analyzed once. As an example, white bracted spineflower may occur in three different vegetation types including Mojave juniper and woodland scrub, Mojave pinyon woodland, and desert wash. Thus, while this species may occur in each specific vegetation type, impacts to this species resulting from loss of habitat will only be considered once when determining the appropriate level of significance.~~

Many of the special-status plant species potentially occurring in the proposed Project are annuals or herbaceous perennials that may emerge and bloom only once every several years and then generally for only a few months. Other species are conspicuous perennials. Different mitigation strategies were adopted for these two categories of plants because mitigation measures involving pre-construction surveys and avoidance are principally feasible only for the perennial species which can potentially be detected even when not in bloom.

The overall approach to mitigation for impacts to special-status plant populations is to avoid through redesign to the extent practicable. Where avoidance of impacts is not feasible, mitigation should be accomplished through one or more of the following measures: restoration of onsite habitats, preservation of ~~similar~~offsite lands, ~~nearby habitat, and/or the perpetual~~and insuring permanent protection through an approved mechanism by the appropriate agency, and/or comparable restoration efforts approved by the appropriate agency.~~and preservation of existing populations.~~

Assumptions and Approach Regarding Restoration

The highly diverse habitat types that occur throughout the northern, central, and southern regions of the proposed Project will constrain restoration opportunities. There are a number of limiting factors in regard to locating areas that would be suitable for restoration/revegetation, such as varied land ownership and /or agency jurisdiction, lack of irrigation water in remote locations, existing unique resources, existing noxious weed infestations, access, topography, soil conditions, and hydrology. The following is a brief overview of the general restoration/revegetation approach that could be implemented for each of the regions along the Project alignment.

Northern Region

The Northern Region will be the most difficult environment to successfully restore/revegetate as arid land restoration is very challenging. Temporary impacts within this region will primarily be addressed through implementing Best Management Practices (BMPs). The Project BMPs should include revegetation techniques such as high density seeding of decommissioned roads and other disturbed areas in order to provide a native seed bank. This will aid in early establishment of target species and provide additional value in competition with non-native species that may establish in the disturbance areas. This effort will

need to be combined, in most areas, with a sustained program to control non-native invasive plants in the impact footprint until the native seeding has established adequate native plant cover.

Central Region

The Central Region, which includes the ANF, provides some opportunities for restoration. Efforts to restore temporary impact areas may include, but are not limited to, salvage of topsoil, decompaction and recontouring, seeding, container plantings, barricades, erosion control, hydroseeding, mulching/slashing, and weed control. In restoring species-specific Project disturbed oak or other tree habitats container plantings, direct seeding with acorns, or any other suitable restoration method of the various oaks or tree species should be considered. Container plantings for all species utilized for revegetation will be grown from locally collected source material and irrigated to ensure establishment. All areas impacted and disturbed by any Project activities will be reseeded with locally collected native seed. On public lands, topsoil may receive the following treatment: ~~Topsoil Reasonable r~~Retrievable topsoil to a depth of 6 inches to 2 feet will ~~also~~ be salvaged, stored and respread on temporary disturbance areas, where feasible, as part of the restoration effort for ~~all sites impacted by grading or other significant soil disturbance~~temporary disturbance areas. Topsoil stockpiles will be designed and constructed to maximize recoverability and minimize wind and water erosion. Topsoil salvaging sites will be limited by weed content, slope, availability of stockpile sites, and consistency with Mitigation Measure V-1. An aggressive weed control program will be required within all disturbed areas within the ANF to aid in control of such species as Spanish broom (*Spartium junceum*), yellow-star thistle (*Centaurea solstitialis*), tocalote (*C. melitensis*), arundo (*Arundo donax*), fountain grass (*Pennisetum sp*), and non-native annual grasses.

The success of the restoration effort will be measured quantitatively with annual reports. The Project will be monitored for ~~a~~ up to ~~minimum of five~~ten years. If the success criteria are not met after ~~five~~ ten years, restoration will continue until the success criteria are met. All plantings shall have a minimum of 80 percent survival, by species, the first year and 100 percent survival thereafter and/or shall attain 75 percent cover after three years and 90 percent cover after ~~five~~ ten years for the life of the Project. Prior to the mitigation sites being determined successful, they shall be entirely without supplemental irrigation for a minimum of two years. ~~No single species shall constitute more than 50 percent of the vegetative cover, no woody invasive species shall be present, no herbaceous invasive species not currently found in the disturbance area shall be present, and herbaceous invasives currently located in the disturbance area shall not exceed five percent cover~~Success criteria and performance standards will be contained in the Habitat Revegetation and Restoration Plan in coordination with the applicable regulatory agencies and will be based on specific habitat and structure. If the survival and cover requirements have not been met, the Operator is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements for ~~five~~ ten years after planting.

Project impacts to riparian habitat within the Central Region are high, as evidenced by the number of Riparian Conservation Areas that are impacted by both Project construction and maintenance. There are numerous opportunities to enhance and restore riparian habitat throughout the Central Region. The control of Arundo/giant reed should be considered a high priority as the large expanse currently provides minimal habitat value. The eradication of giant reed would provide a large area that could be restored to native riparian habitat. Restoration of these areas to native riparian habitat would provide a dramatic increase in habitat functions and values in this area, which supports a number of special-status species. Given the large area that could be available for restoration, the ANF should also be considered for out-of-kind mitigation for impacts to other habitat types.

Southern Region

The Southern Region provides the best opportunity for active restoration/revegetation to mitigate for temporary impacts, particularly in the Whittier Narrows area. Although Project impacts to riparian habitat are minimal, there are numerous opportunities to enhance and restore riparian habitat throughout the Southern Region. The control of giant reed in the Whittier Narrows area should be considered a high priority as the large expanse currently provides minimal habitat value. The eradication of giant reed would provide a large area that could be restored to native riparian habitat. Restoration of these areas to native riparian habitat would provide a dramatic increase in habitat functions and values in this area, which supports a number of special-status species. Given the large area that could be available for restoration, the Whittier Narrows as well as the ANF and Chino Hills State Park should also be considered for out-of-kind mitigation for impacts to other habitat types. The Puente/Chino Hills area presents a rather difficult scenario for restoration partly due to the existing land use practices and varied ownership. However, this area contains large stands dominated by invasive black mustard that could be restored to native coastal sage scrub. Also, any direct impacts to California Walnut Woodland should be mitigated through replanting in the vicinity of the impact area to expand the current southern California black walnut stands.

Chino Hills State Park has a large number of areas that are impacted by non-native species that could be restored to coastal sage scrub or chaparral. Also, riparian areas in Chino Hills State Park are key for providing stop-over locations for migratory birds, and could be another location for restoration.

3.4.5 Alternative 1: No Project/Action

Under the No Project/Action Alternative, the proposed Project and its alternatives would not be implemented. As such, associated impacts to biological resources would not immediately occur. However, in the absence of the proposed Project or an alternative, a similar project will need to be developed to interconnect new wind turbine-based electricity generated from the Tehachapi Wind Resource Area (TWRA) with the energy distribution systems of the Los Angeles Basin. This future project would be required to meet the power transmission needs and, consequently, would likely result in biological impacts similar to, or in addition to those stemming from the proposed Project and its alternatives.

Environmental conditions in the Project Area, including the regional setting and baseline conditions, are expected to change over time with or without the proposed Project or an alternative to the proposed Project. The following sections describe how biological resources within the Project Area are expected to change over time under the No Project/Action Alternative. Since the potential impacts of the proposed Project would not occur under the No Project/Action Alternative, the significance criteria described in Section 3.4.4.1 (Impact Analysis Approach) are not used to analyze this alternative.

Throughout the entire project area, ongoing maintenance of the existing transmission lines would continue to occur. With respect to Biological Resources, this includes periodic trimming of vegetation to maintain minimum clearance distances to the conductors and around towers, to comply with regulations governing the operation of transmission facilities. In addition, access roads require periodic maintenance and vegetation trimming to allow maintenance crews to access the lines.

Northern Region

There are currently 17 residential housing developments, infrastructural improvements, and wind energy generation facilities proposed for the Northern Region with a cumulative acreage of more than 98,000 acres (described in Table 3.4-25 of Section 3.4.6.2, Cumulative Impacts). In the reasonably foreseeable future, these and similar development projects will result in impacts to biological resources in the region. Impacts are expected to be greatest in the southern Antelope Valley surrounding the cities of Lancaster and Palmdale, and in the northern Antelope Valley near proposed wind energy developments in Willow Springs and east of Tehachapi Pass. Habitat loss and fragmentation within these areas will negatively impact State- and federally listed plant and wildlife species such the San Fernando Valley spineflower, desert tortoise, and Mohave ground squirrel.

Central Region

The Central Region of the Project Area includes the ANF. The ANF will continue to be managed by the FS, regardless of implementation of the proposed Project or an alternative to the proposed Project, including the No Project/Action Alternative. Under the No Project/Action Alternative, the existing transmission lines would remain in place and approximately 80 miles of access and spur roads would continue to be used ~~for~~ and maintained for maintenance of the lines. Biological resources within the Central Region would continue to be managed by the FS.

Southern Region

The Southern Region is highly urbanized but includes patches of undeveloped lands that support unique and diverse biological resources. The cities and communities of the Los Angeles Basin are expected to expand in the future, thereby placing greater strain on biological resources throughout the Southern Region. It is predicted that fragmentation and loss of habitat in the region will continue to impact rare, threatened, and endangered species in this region, including the coastal California gnatcatcher and least Bell's vireo. Most immediately impacted will be the Puente and Chino Hills in Los Angeles, Orange, and San Bernardino counties. Within this region, there are currently seven residential housing development projects planned covering more than 6,400 acres (described in Table 3.4-26 of Section 3.4.6.2, Cumulative Impacts).

3.4.6 Alternative 2: SCE's Proposed Project

For purposes of this section, many ground-disturbing Project activities are likely to result in permanent impacts to habitats for native plants and wildlife species. Examples of permanent impacts include construction of structures such as new towers or substations, and improvements to existing roads as well as construction of new roads that will be maintained throughout the Project. ~~Construction related impacts are also considered permanent in nature if they occur in fragile, slowly maturing, or xeric vegetation types, which may be difficult or impossible to successfully restore or if revegetation is not expected to occur within five years. However, o~~Other ground disturbance activities restricted solely to the construction phase, such as grading roads and clearing vegetation within staging and pulling areas, are considered temporary provided that native vegetation is not replaced with infrastructure or the area is not maintained free of vegetation, and that restoration is deemed feasible prior to Project implementation. However, it is important to note that impacts to some vegetation communities that are considered in this analysis to be temporary due to the fact that restoration would occur post-construction, would actually take years to recover the functional values they provided prior to disturbance. Examples of these

communities include woodlands, communities in xeric environments such as those that occur in the Northern Region, and mature riparian habitats. Some of these communities can take up to 50 to 100 years to fully recover. These habitat types would be mitigated at higher ratios than communities that are expected to recover within the 10-year restoration period.

Impacts are discussed and mitigations prescribed, where appropriate, for each vegetation type taking into consideration its ecological condition, floristic composition, and relative rarity on a local and regional basis. The same vegetation types are also analyzed as habitat capable of supporting special-status wildlife species, and for compliance with local and regional policies.

3.4.6.1 Direct and Indirect Effects Analysis

Impacts to Riparian or Natural Communities (Criterion BIO1)

Construction impacts to vegetation communities may occur in a variety of ways, including the direct removal of plants during the course of construction. Clearing and grading associated with the placement of towers, construction of helicopter staging areas, and the construction and widening of access and spur roads may also result in the alteration of soil conditions, including the loss of native seed banks and changes to the topography and drainage of a site such that the capability of the habitat to support native vegetation is impaired. Construction may also result in the creation of conditions that are favorable for the invasion of weedy exotic species that prevent the establishment of desirable vegetation and may adversely affect wildlife. Desert ecosystems in the Antelope Valley and some plant communities within the San Gabriel Mountains are especially susceptible to ground disturbance and ~~can~~ may take decades to recover, if at all. ~~For example, clearing or substantial pruning of oak woodlands may take decades to functionally recover to pre-construction conditions; while disturbance from military exercises conducted in desert ecosystems during the Second World War remains visible to this day.~~

Plant Communities

Impact B-1: Construction activities would result in temporary and permanent losses of native vegetation.

Implementation of the proposed Project would require construction to occur within a broad array of habitat types. While SCE intends to avoid special-status plant communities to the maximum extent possible and would flag resources for avoidance, construction of the proposed Project would still result in disturbance to a variety of plant communities.

Project impacts are considered permanent if they involve the conversion of land to a new use, such as with the construction of new roads or the footings of towers. Temporary project impacts are those effects that do not result in a permanent land use conversion. Temporary effects to vegetation communities or other ground disturbance activities restricted solely to the construction phase, such as grading roads and clearing vegetation within staging and pulling areas, are considered temporary provided that native vegetation is not replaced with infrastructure or the area is not maintained free of vegetation, and that restoration is deemed feasible prior to project implementation.

Direct impacts to native vegetation communities would occur as a result of the removal of vegetation during construction activities. These ground-disturbing construction activities would include clearing and grading for tower pad preparation, tower removal sites, pulling and tensioning sites, helicopter staging areas, and construction, grading, and widening of new spur roads and existing access roads. Tables 3.4-17 and 3.4-18 present the approximate temporary and permanent impacts to vegetation communities that

would occur from implementation of the proposed Project. It is important to note that acreages presented in these tables were determined using only GIS information provided by SCE and the FS. This information slightly differs from the disturbance acreages presented in Chapter 2 (Description of Alternatives), which were determined using the more detailed land disturbance information provided in SCE's PEA (SCE, 2007) with some modifications based on the GIS data, specifically with respect to tower counts and road information. However, the GIS method was necessary to spatially map impact areas to determine vegetation communities affected by the Project. Some areas of disturbance that were included in the calculations provided in Chapter 2 but were not available as GIS information include turning radii from access to spur roads and guard pole structures. In addition, the locations of many staging areas, pulling and stringing locations, and towers have not been determined yet, especially on non-NFS lands, and are not included in the GIS information. Therefore, the total disturbance acreages to vegetation communities that were determined using GIS are lower than what is reported in Chapter 2 as total land disturbance. The acreages associated with temporary and permanent disturbances for which location information is currently unknown have been quantified in Tables 3.4-17 and 3.4-18 as "Other", meaning that these acreages are associated with the development of the proposed Project, but information regarding the locations, and therefore the specific vegetation communities impacted, is unknown at this time as final engineering has not yet been conducted. In total, the proposed Project would permanently disturb a minimum of approximately ~~55~~ 48 acres of ~~rare~~ vegetation identified as rare and worthy of consideration by the CDFG (~~228~~ 253 acres of non-rare vegetation) and would temporarily impact a minimum of approximately ~~231~~ 221 acres of rare vegetation (~~1,033~~932 acres of non-rare vegetation). Additional acreages of land disturbance would occur, but the vegetation communities impacted are unknown at this time as final engineering has not been conducted. This includes approximately 128 acres of permanent disturbance and 110 acres of temporary disturbance. Figure 3.4-4 (located in the Map & Figures Series Volume) includes detailed vegetation maps of the entire proposed Project and alternatives transmission line routes.

Indirect impacts to native vegetation communities could include alterations in existing topography and hydrology regimes, the accumulation of fugitive dust, disruptions to native seed banks from ground disturbance, and the colonization of non-native, invasive plant species.

Ongoing operations and maintenance impacts would occur during routine inspection and maintenance of the proposed Project facilities or as a result of facilitated public access. These impacts would include trampling or crushing of native vegetation by vehicular or foot traffic, alterations in topography and hydrology, increased erosion and sedimentation, and the introduction of non-native, invasive plants due to increased human presence.

Within the ANF permanent disturbance to vegetation totals approximately ~~92~~ 110 acres, and temporary impacts to vegetation total approximately ~~244~~ 158 acres. Specific impacts to each major plant community are discussed below.

Ruderal Grasslands, California Annual Grasslands, Agricultural Communities, and Non-native Woodlands

Construction of the proposed Project would result in the loss of approximately ~~125~~ 123 acres of California annual grassland habitat, 61 acres of ruderal grassland habitat, ~~24~~ 21 acres of non-native woodland habitat, 173 acres of agricultural land, and ~~353~~ 360 acres of barren/developed areas as a result of the Project-related activities (Tables 3.4-17 and 3.4-18). On the ANF, Project activities would result in the temporary loss of ~~59~~ 27 acres and permanent loss of ~~44~~ 79 acres to these communities (Table 3.4-18). As

a relative index of availability, within the ANF there are approximately 28,009 acres of annual grassland habitat, 238 acres of non-native woodland habitat, and 241 acres of agricultural land. Within mapped areas of the entire proposed Project there are approximately 2,197 acres of California annual grassland habitat; 740 acres of ruderal grassland habitat; 245 acres of non-native woodland habitat; 879 acres of agricultural land; and 5,442 acres of barren/developed areas. Thus, the approximate loss of these habitats relative to their overall availability in the Project area ranges from ~~6~~ 7 percent for barren/developed areas to 20 percent for agricultural land. Impacts of this magnitude to ruderal grassland, non-native woodland, agricultural, and barren/developed areas do not typically result in adverse effects to biological resources as they are not rare. These habitats are common within the local and regional landscape, and the relative quality of these habitat types is low due to on-going anthropogenic disturbances, including the introduction of intensive agricultural activities and road construction. Many grasslands in the state and within the proposed Project have been subjected to ground disturbance and are heavily colonized by exotic grasses. Such disturbed grasslands provide only marginal habitat for most native plants. However, other less disturbed grassland areas appearing to be dominated by exotic grasses for most of the year may be dominated by numerous species of native annual wildflowers in the spring (Sawyer and Keeler-Wolf 1995). These "wildflower fields" (Holland 1986), which are abundant within the proposed Project in the Antelope Valley, are often difficult to distinguish from disturbed, low diversity grasslands in surveys conducted outside of the spring blooming period. Both types of annual grassland communities are important foraging areas for raptors and other wildlife. The clearance of these areas would require restoration after construction to ensure that type changes from annual grassland to ruderal or barren habitat does not occur, to ensure storm water runoff does not lead to off-site sediment transport, and to reduce or limit the effects of wildfire on adjacent communities.

As described above with the exception of agricultural or barren/developed land, construction activities that result in disturbance to non-native or annual grasslands could lead to the spread or colonization of exotic weeds and could lead to type changes to more ruderal or disturbed habitats. While SCE proposes to implement APM BIO-2 which indicates that a Revegetation Plan would be prepared for native habitats, the APM does not address impacts to annual grasslands or ruderal habitats and does not provide details as to the contents of the Revegetation Plan.

Table 3.4-17. Impacts to Vegetation Communities and Required Mitigation – Proposed Project Area Excluding NFS Lands*

Vegetation Communities	Permanent Impacts (acres)			Temporary Impacts (acres)				Total Mitigation (acres)
	Impact	Ratio	Off-site Mitigation	Impact	Ratio	On-site Restoration	Off-site Mitigation	
Woodland Vegetation								
Bigcone Douglas fir-Canyon Oak Forest	0	2:1	0	0.08	1:1	0.08	0	0.08
California Walnut Woodland	1.4	1.5:1	~~4.2~~ 2.10	4.57	1:1	4.57	0	~~8.77~~ 6.67
Coast Live Oak Woodland	0.68	1.5:1	~~1.36~~ 1.02	13.27	1:1	13.27	0	~~14.63~~ 14.29
Joshua Tree Woodland	0.76	2:1	~~2.28~~ 1.52	5.81	1:1	5.81	0	~~8.09~~ 7.33

Table 3.4-17. Impacts to Vegetation Communities and Required Mitigation – Proposed Project Area Excluding NFS Lands*

Vegetation Communities	Permanent Impacts (acres)			Temporary Impacts (acres)				Total Mitigation (acres)
	Impact	Ratio	Off-site Mitigation	Impact	Ratio	On-site Restoration	Off-site Mitigation	
Mojavean Pinyon Woodland	0	2:1	0	0.28	1:1	0.28	0	0.28
Non-native Woodland	4.63	~~0~~1:1	~~0~~ 4.63	6.27	~~0~~1:1	~~0~~ 6.27	0	~~0~~ 10.90
Subtotal	7.47		~~7.84~~ 9.27	30.28		~~24.01~~ 30.28	0	~~31.85~~ 39.55
Shrub-dominated Vegetation								
Big Sagebrush Scrub	0.87	1:1	~~1.74~~ 0.87	2.43	1:1	2.43	0	~~4.17~~ 3.30
Coastal Sage Scrub	7.01	1.5:1	10.52 ~~21.03~~	30.85	1:1	30.85	0	~~51.88~~ 41.37
Desert Saltbush Scrub	0	1:1	0	138.1	1:1	138.1	0	138.1
Mixed Chaparral	2.21	1:1	2.21 ~~4.42~~	7.22	1:1	7.22	0	~~11.64~~ 9.43
Mojave Creosote Bush Scrub	2.82	1:1	2.82 ~~5.64~~	140.42	1:1	140.42	0	~~146.06~~ 143.24
Mojave Mixed Woody Scrub	0	1:1	0	8.61	1:1	8.61	0	8.61
Mojavean Juniper Woodland and Scrub	29.33	1.5:1	44.0 ~~87.99~~	82.73	1:1	82.73	0	~~170.72~~ 126.73
Mulefat Scrub	0	3:1	0	0.04	1:1	0.04	0	0.04
Rabbitbrush Scrub	0	1:1	0	15.04	1:1	15.04	0	15.04
Riversidean Alluvial Fan Sage Scrub	0	3:1	0	1.1	1:1	1.1	0	1.1
Subtotal	42.24		~~120.82~~ 60.41	426.54		426.54	0	~~547.36~~ 486.95
Riparian Vegetation								
Desert Wash	0.12	3:1	0.36	5.1	1:1	5.1	0	5.46
Ruderal Wetland	0.38	~~0~~1:1	~~0~~ 0.38	0.96	~~0~~1:1	~~0~~ 0.96	0	~~0~~ 1.34
Exotic-Giant Reed	0	~~0~~1:1	0	0.02	~~0~~1:1	0.02	0	0.02
Southern Arroyo Willow Riparian Forest	0	3:1	0	0.77	1:1	0.77	0	0.77
Southern Coast Live Oak Riparian Forest	0	3:1	0	0.42	1:1	0.42	0	0.42
Southern Cottonwood Willow Riparian Forest	0	3:1	0	0	1:1	0	0	0
Southern Sycamore – Alder Riparian Forest	0.1	3:1	0.3	0.79	1:1	0.79	0	1.09
Southern Willow Scrub	0.85	3:1	2.55	0.73	1:1	0.73	0	3.28

Table 3.4-17. Impacts to Vegetation Communities and Required Mitigation – Proposed Project Area Excluding NFS Lands*

Vegetation Communities	Permanent Impacts (acres)			Temporary Impacts (acres)				Total Mitigation (acres)
	Impact	Ratio	Off-site Mitigation	Impact	Ratio	On-site Restoration	Off-site Mitigation	
Sparsely Vegetated Streambed	0.3	3:1	0.9	0.02	1:1	0.02	0	0.92
Subtotal	1.75		~~4.11~~ 4.49	8.81		~~7.83~~ 8.81	0	~~11.94~~ 13.30
Herbaceous Vegetation								
Bunchgrass Grassland	1.32	1.5:1	~~3.96~~ 1.98	0.01	1:1	0.01	0	~~3.97~~ 1.99
California Annual Grassland	19.32	1:1	~~38.64~~ 19.32	97.25	1:1	97.25	0	~~135.89~~ 116.57
Deerweed and Chia Herbaceous Field, Recently Burned	0	1:1	0	0	1:1	0	0	0
Desert Bunchgrass Grassland	0	1.5:1	0	64.69	1:1	64.69	0	64.69
Ruderal Grassland	22.66	~~0~~1:1	0	37.91	~~0~~1:1	0	0	0
Wildflower Field	1.84	1:1	~~5.52~~ 1.84	3.46	1:1	3.46	0	~~8.98~~ 5.3
Subtotal	45.14		~~48.12~~ 23.14	203.32		165.41	0	~~213.53~~ 188.55
Anthropogenic Vegetation								
Agriculture	9.71	0:1	0	163.5	0:1	0	0	0
Barren/developed	84.22	~~0~~1:1	0	187.44	~~0~~1:1	0	0	0
Subtotal	93.93		0	350.94		0	0	0
Other**	49.21	-	-	84.86	-	-	-	-
GRAND TOTAL	~~190.53~~ 239.74		~~180.89~~ 97.31	~~1019.89~~ 1,104.75		~~623.79~~ 631.04	0	~~804.68~~ 728.35

*Disturbance acreages were developed based on GIS information provided by SCE and the FS. Not all areas of potential disturbance were included in the GIS information. See Chapter 2 for disturbance calculations.

**This category includes disturbance acreages reported in Chapter 2 for which location information, and therefore specific vegetation communities impacted, is unknown at this time.

Vegetation communities listed in **bold** are considered rare and worthy of consideration by the CDFG. (CDFG, 2003a)

~~**Table 3.4-18. Impacts to Vegetation Communities and Required Mitigation – Proposed Project Area within the Angeles National Forest***~~

~~Vegetation Communities~~	~~Permanent Impacts (acres)~~			~~Temporary Impacts (acres)~~				~~Total Mitigation (acres)~~
	~~Impact~~	~~Ratio~~	~~Off-site Mitigation~~	~~Impact~~	~~Ratio~~	~~On-site Restoration~~	~~Off-site Mitigation~~	
~~Woodland Vegetation~~								
~~Bigcone Douglas-fir-Canyon Oak Forest~~	~~3.61~~	~~5:1~~	~~18.05~~	~~8.88~~	~~2:1~~	~~17.76~~	~~0~~	~~35.81~~
~~Canyon Oak Forest~~	~~6.78~~	~~5:1~~	~~33.90~~	~~19.29~~	~~1:1~~	~~19.29~~	~~0~~	~~53.19~~

Table 3.4-18. Impacts to Vegetation Communities and Required Mitigation – Proposed Project Area within the Angeles National Forest*

Vegetation Communities	Permanent Impacts (acres)			Temporary Impacts (acres)				Total Mitigation (acres)
	Impact	Ratio	Off-site Mitigation	Impact	Ratio	On-site Restoration	Off-site Mitigation	
Coast Live Oak Woodland	0	5:1	0	0.29	1:1	0.29	0	0.29
Coulter Pine Forest	0.54	3:1	1.62	2.26	1:1	2.26	0	3.88
Mojavean Pinyon Woodland	1.05	5:1	5.25	1.46	2:1	2.92	0	8.17
Nonnative woodland	2.45	3:1	7.35	10.46	1:1	10.46	0	17.81
Yellow Pine Forest	0	3:1	0	2.73	1:1	2.73	0	2.73
Subtotal	14.55		66.77	45.37		55.71	0	122.48
Shrub-dominated Vegetation								
Big Sagebrush Scrub	0.07	3:1	0.21	0	1:1	0	0	0.21
Chamise Chaparral	2.63	3:1	7.89	18.15	1:1	18.15	0	26.04
Coastal Sage Scrub	0.10	5:1	0.50	0.32	2:1	0.64	0	1.14
Interior Live Oak Scrub	0.95	5:1	4.75	3.14	1:1	3.14	0	7.89
Mixed Chaparral	23.15	3:1	69.45	104.85	1:1	104.85	0	174.30
Mojavean Juniper Woodland and Scrub	0.87	5:1	4.35	1.49	2:1	2.98	0	7.33
Mojavean Pinyon and Juniper Woodland, Recently Burned	2.93	5:1	14.65	6.01	2:1	6.01	0	20.66
Scrub Oak Chaparral	2.25	5:1	11.25	4.82	1:1	4.82	0	16.07
Subtotal	32.95		113.05	138.78		140.59	0	253.64
Riparian Vegetation								
California Bay Forest	0.12	5:1	0.60	0	1:1	0	0	0.60
Desert Wash	0.05	5:1	0.25	0	2:1	0	0	0.25
Southern Arroyo Willow Riparian Forest	0	5:1	0	0.25	2:1	0.50	0	0.50
Southern Coast Live Oak Riparian Forest	0.07	5:1	0.35	0	2:1	0	0	0.35
Southern Cottonwood-Willow Riparian Woodland	0.03	5:1	0.15	0.30	2:1	0.60		0.75
Southern Sycamore – Alder Riparian Forest	0.31	5:1	1.55	0.31	2:1	0.62	0	2.17
Southern Willow Scrub	0.31	5:1	1.55	0	2:1	0	0	1.55
Sparsely Vegetated Streambed	0.01	5:1	0.05	0.02	2:1	0.04	0	0.09

~~**Table 3.4-18. Impacts to Vegetation Communities and Required Mitigation – Proposed Project Area within the Angeles National Forest***~~

~~Vegetation Communities~~	~~Permanent Impacts (acres)~~			~~Temporary Impacts (acres)~~				~~Total Mitigation (acres)~~
	~~Impact~~	~~Ratio~~	~~Off-site Mitigation~~	~~Impact~~	~~Ratio~~	~~On-site Restoration~~	~~Off-site Mitigation~~	
~~Subtotal~~	~~0.78~~		~~3.90~~	~~0.88~~		~~1.76~~	~~0~~	~~5.66~~
~~Herbaceous Vegetation~~								
~~California Annual Grassland~~	~~0.06~~	~~3:1~~	~~0.18~~	~~8.39~~	~~1:1~~	~~8.39~~	~~0~~	~~8.57~~
~~Deerweed and Chia Herbaceous Field, Recently Burned~~	~~2.25~~	~~3:1~~	~~6.75~~	~~10.99~~	~~2:1~~	~~21.98~~	~~0~~	~~28.73~~
~~Subtotal~~	~~2.31~~		~~6.93~~	~~19.38~~		~~30.37~~	~~0~~	~~37.30~~
~~Anthropogenic Vegetation~~								
~~Barren/Developed~~	~~41.39~~	~~0:1~~	~~0~~	~~40.02~~	~~0:1~~	~~0~~	~~0~~	~~0~~
~~Ruderal Grassland~~	~~0~~	~~0:1~~	~~0~~	~~0~~	~~0:1~~	~~0~~	~~0~~	~~0~~
~~Subtotal~~	~~41.39~~		~~0~~	~~40.02~~		~~0~~	~~0~~	~~0~~
~~GRAND TOTAL~~	~~91.98~~		~~190.65~~	~~244.43~~		~~228.43~~	~~0~~	~~419.08~~

~~*Disturbance acreages were developed based on GIS information provided by SCE and the FS. Not all areas of potential disturbance were included in the GIS information. See Chapter 2 for disturbance calculations.~~

~~Vegetation communities listed in **bold** are considered rare and worthy of consideration by the CDFG. (CDFG, 2003a)~~

Table 3.4-18. Impacts to Vegetation Communities and Required Mitigation – Proposed Project Area within the Angeles National Forest*

Vegetation Communities	Permanent Impacts (acres)			Temporary Impacts (acres)				Total Mitigation (acres)
	Impact	Ratio	Off-site Mitigation	Impact	Ratio	On-site Restoration	Off-site Mitigation	
Woodland Vegetation								
Bigcone Douglas fir-Canyon Oak Forest	1.48	5:1	7.4	4.11	2:1	8.22	0	15.62
Canyon Oak Forest	3.57	5:1	17.85	4.73	1:1	4.73	0	22.58
Coast Live Oak Woodland	0	5:1	0	0.29	1:1	0.29	0	0.29
Coulter Pine Forest	0.27	3:1	0.81	1.20	1:1	1.20	0	2.01
Mojavean Pinyon Woodland	0.46	5:1	2.30	0.67	2:1	1.34	0	3.64
Nonnative Woodland	0	1:1	0	10.46	1:1	10.46	0	10.46
Yellow Pine Forest (Plantation)	0	3:1	0	0	1:1	0	0	0
Subtotal	5.78		28.36	21.46		26.24	0	54.60
Shrub-dominated Vegetation								
Big Sagebrush Scrub	0	3:1	0	0	1:1	0	0	0
Chamise Chaparral	3.16	3:1	9.48	10.85	1:1	10.85	0	20.33
Coastal Sage Scrub	0.02	5:1	0.10	0	2:1	0	0	0.10
Interior Live Oak Scrub	1.22	5:1	6.10	1.27	1:1	1.27	0	7.37
Mixed Chaparral	16.79	3:1	50.37	58.44	1:1	58.44	0	108.81
Mojavean Juniper Woodland and Scrub	0.20	5:1	1.00	0.50	2:1	1.00	0	2.00

Table 3.4-18. Impacts to Vegetation Communities and Required Mitigation – Proposed Project Area within the Angeles National Forest*

Vegetation Communities	Permanent Impacts (acres)			Temporary Impacts (acres)				Total Mitigation (acres)
	Impact	Ratio	Off-site Mitigation	Impact	Ratio	On-site Restoration	Off-site Mitigation	
Mojavean Pinyon and Juniper Woodland, Recently Burned	0.82	5:1	4.10	3.50	2:1	7.00	0	11.10
Restoration – California Buckwheat	0	1:1	0	7.46	1:1	7.46	0	7.46
Scrub Oak Chaparral	1.09	5:1	5.45	3.10	1:1	3.1	0	8.55
Subtotal	23.30		76.60	85.12		89.12	0	165.72
Riparian Vegetation								
California Bay Woodland	0.09	5:1	0.45	0	1:1	0	0	0.45
Desert Wash	0	5:1	0	0	2:1	0	0	0
Southern Arroyo Willow Riparian Forest	0	5:1	0	0	2:1	0	0	0
Southern Coast Live Oak Riparian Forest	0.02	5:1	0.10	0	2:1	0	0	0.10
Southern Cottonwood-Willow Riparian Woodland	0.06	5:1	0.30	0	2:1	0	0	0.30
Southern Sycamore – Alder Riparian Forest	0.06	5:1	0.30	0.30	2:1	0.60	0	0.90
Southern Willow Scrub	0.06	5:1	0.30	0	2:1	0	0	0.30
Sparsely Vegetated Streambed	0	5:1	0	0.02	2:1	0.04	0	0.04
Subtotal	0.29		1.45	0.32		0.64	0	2.09
Herbaceous Vegetation								
California Annual Grassland	0.07	3:1	0.21	6.30	1:1	6.30	0	6.51
Deerweed and Chia Herbaceous Field, Recently Burned	1.38	3:1	4.14	10.35	2:1	20.70	0	24.84
Subtotal	1.45		4.35	16.65		27.00	0	31.35
Anthropogenic Vegetation								
Barren/Developed	79.04	1:1	79.04	9.79	1:1	9.79	0	88.83
Ruderal Grassland	0	1:1	0	0	1:1	0	0	0
Subtotal	79.04		79.04	9.79		9.79	0	88.83
Other**	0	-	-	24.96	-	-	-	-
GRAND TOTAL	109.86		189.80	158.30		152.79	0	342.59

*Disturbance acreages were developed based on GIS information provided by SCE and the FS. Not all areas of potential disturbance were included in the GIS information. See Chapter 2 for disturbance calculations.

**This category includes disturbance acreages reported in Chapter 2 for which location information, and therefore specific vegetation communities impacted, is unknown at this time.

Vegetation communities listed in **bold** are considered rare and worthy of consideration by the CDFG. (CDFG, 2003a)

Mojave Creosote Bush Scrub, Mojave Mixed Woody Scrub, Big Sagebrush Scrub, Deerweed and Chia Herbaceous Field (recently burned), Rabbitbrush Scrub, and Desert Saltbush Scrub Habitat

These xeric plant communities occur primarily within the Northern Region of the proposed Project between the proposed wind farm areas and the Vincent Substation. Many of these areas, particularly areas mapped as Mojave creosote bush scrub, are highly degraded by intensive, yearly sheep grazing. Construction of the proposed Project would result in the loss of approximately 143 acres of Mojave

creosote bush scrub habitat, 9 acres of Mojave mixed woody scrub habitat, 3 acres of big sagebrush scrub, ~~13~~ 12 acres of deerweed and chia herbaceous field (recently burned) habitat, 15 acres of rabbitbrush scrub habitat, and 138 acres of desert saltbush scrub habitat. Approximately 2,793 acres of Mojave creosote bush scrub habitat, 350 acres of Mojave mixed woody scrub habitat, 273 acres of deerweed and chia herbaceous field (recently burned), 408 acres of rabbitbrush scrub habitat, and 292 acres of desert saltbush scrub habitat occur within mapped areas along the proposed Project. This approximate loss of these habitats relative to this index of their availability ranges from 4 percent for rabbitbrush scrub habitat to 47 percent for desert saltbrush scrub. In addition to being abundant within the proposed Project, these habitats are regionally abundant: the West Mojave Plan (WMP), which covers nearly 9,400,000 acres and includes the entire Northern Region of the proposed Project, lists 5,683,646 acres of Mojave creosote scrub habitat; 114,982 acres of big sagebrush scrub habitat; 7,842 acres of rabbitbrush scrub habitat; and 802,701 acres of desert saltbush scrub as occurring within the WMP planning area (BLM 2005). Furthermore, much of these habitats are less likely to be developed as they are under BLM, NPS, FS, or Department of Defense (DOD) ownership. However, 32 percent of the lands within the WMP planning area are privately owned and one percent is owned by the State of California. A portion of these areas is likely to be developed as ongoing urbanization in the planning area continues. Recently burned areas are in an early successional state, and may currently support numerous species of ephemeral fire-following native wildflowers.

Chamise Chaparral, Mixed Chaparral, and Scrub Oak Chaparral Habitats

Chaparral-based vegetation types such as those listed above occur in the central and southern portions of the proposed Project. Implementation of the proposed Project would result in the direct removal of approximately ~~21~~ 14 acres of chamise chaparral habitat (3.16 permanent and 10.85 temporary on the ANF; 0.03% of the total available on the ANF), ~~137~~ 85 acres of mixed chaparral habitat (16.79 permanent and 58.44 temporary on the ANF; 0.03% of the total available on the ANF), and ~~7~~ 4 acres of scrub oak chaparral habitat (1.09 permanent and 3.10 temporary on the ANF; 0.01% of the total available on the ANF). These habitats are locally and regionally abundant. As a relative index of availability, approximately 357 acres of chamise chaparral habitat, 3,304 acres of mixed chaparral habitat, and 183 acres of scrub oak chaparral habitat occur within mapped areas along the proposed Project and approximately 40,424 acres of chamise chaparral habitat, 240,230 acres of mixed chaparral habitat, and 36,613 acres of scrub oak chaparral habitat occur within the entire Angeles National Forest. Thus, the approximate loss of these habitats relative to their overall availability in the Project area ranges from ~~four~~ two percent for ~~mixed chaparral and~~ scrub oak chaparral to ~~six~~ four percent for chamise chaparral. Much of this habitat in the region is not likely to be developed as it is under state or federal ownership. As described above, while relatively common, the loss of these habitats can result in the spread of noxious or invasive weeds, alter the fire regime of a given area, or have the potential to support rare species of plants and wildlife. Specific discussions regarding the loss of foraging or nesting habitat and impacts to special-status species are located below.

Joshua Tree Woodland, Mojave Juniper Woodland and Scrub, and Mojave Pinyon Woodland Habitat, Including Mojavean Juniper and Pinyon Woodland (recently burned), and Removal of Joshua trees and Juniper Trees

These plant communities occur primarily within the Northern Region of the proposed Project between the proposed wind farm areas and the Vincent Substation. Construction of the proposed Project would result in the loss of approximately 7 acres of Joshua tree woodland habitat (0% on the ANF), ~~114~~ 113 acres of

Mojave juniper woodland and scrub habitat (0.20 permanent and 0.50 temporary on the ANF; 0.02% of the total available on the ANF), ~~3~~ 1 acre~~s~~ of Mojave pinyon woodland habitat (0.46 permanent and 0.67 temporary; 0.01% of the total available on the ANF), and ~~9~~ 4 acres of recently burned Mojavean juniper and pinyon woodland habitat (0.82 permanent and 3.50 temporary on the ANF; 0.03% of the total available on the ANF) (see Tables 3.4-17 and 3.4-18). As a relative index of availability, approximately 142 acres of Joshua tree woodland habitat; 1,098 acres of Mojave juniper woodland and scrub habitat; 76 acres of Mojave pinyon woodland habitat; and 212 acres of recently burned Mojavean juniper and pinyon woodland habitat occur within mapped areas along the proposed Project whereas within the entire ANF there are approximately 116 acres of Joshua tree woodland habitat; 3,669 acres of Mojave juniper woodland and scrub habitat; and 12,963 acres of Mojave pinyon woodland habitat. Thus, the approximate loss of these habitats relative to their overall availability in the Project area ranges from ~~4~~ one percent for Mojave pinyon woodland and recently burned Mojavean juniper and pinyon woodland habitat to ten percent for Mojave juniper woodland and scrub. The WMP, which covers nearly 9,400,000 acres and includes the entire Northern Region of the proposed Project, states that 28,826 acres of Joshua tree woodland and 62,986 acres of juniper woodland occur within the West Mojave Desert (BLM 2005).

Joshua tree and juniper woodland habitats support unique assemblages of plant and wildlife species, and despite the acreage provided in the WMP for existing habitat, vast acreages of these habitats have been lost over the last several decades due to urbanization and agricultural activities in the Antelope Valley. In general, other desert plant communities lack vertical structure and shade. However, these habitats provide the important structural characteristics for mammals and avian species. Additionally, unlike herbaceous or shrub-dominated habitats, arid woodlands are extremely slow developing, with mature juniper and pinyon woodlands requiring as much as 150 years to reach full maturity (Wangler and Minnich, 1996). Due to the unique floristic composition and structure of these communities, and due to historic and on-going losses, several local plans, ordinances, and policies have designated Joshua tree woodland and juniper woodland habitats as special status. The overall approach to mitigation of impacts to special-status habitats is to avoid impacts through redesign of tower locations, spur roads, pulling locations, and staging areas, particularly with regards to habitat types containing large tree species, where individual trees or clumps of trees can be avoided. Where avoidance of impacts is not feasible, SCE shall mitigate through the restoration, enhancement, and/or preservation of existing habitats.

California Walnut Woodland Habitat

California walnut woodland habitat occurs primarily in the southern portion of the proposed Project area (Figure 3.4-4, located in the TRTP Draft EIR/EIS Map & Figures Series Volume). Loss of approximately 6 acres of California walnut woodland habitat will occur as a result of the proposed Project ~~through the replacement of transmission towers~~. The CNDDB (CDFG 1995) estimates that there are approximately 14,579 acres of California walnut woodland habitat present within the State of California, restricted to a highly fragmented range within the southern portion of the state. As California walnut woodland is considered a special-status habitat by CDFG, and California walnut trees are included on CNPS list 4.2, any Project-related impacts to California walnut woodland or individual trees would be considered adverse. Where avoidance of impacts is not feasible, SCE shall mitigate through the restoration, enhancement, and/or preservation of existing California walnut woodland habitats.

Bunchgrass Grassland and Desert Bunchgrass Grassland Habitat

Bunchgrass grassland is found within the southern portions of the proposed Project, while desert bunchgrass grassland is restricted to the Northern Region. Loss of approximately one acre of bunchgrass

grassland habitat and 65 acres of desert bunchgrass grassland habitat would occur as a result of the proposed Project through construction of roads, the Whirlwind Substation, pulling stations, and staging areas, and the replacement of transmission towers. As a relative index of availability, approximately 29 acres of bunchgrass grassland habitat and 325 acres of desert bunchgrass grassland habitat occur within mapped areas along the proposed Project. Thus, the approximate loss of these habitats relative to their availability is three percent and 20 percent for bunchgrass grassland and desert bunchgrass grassland habitat, respectively. Approximately 1,730 acres of bunchgrass grassland habitat (a.k.a. valley needlegrass grassland habitat) are estimated to occur within the area covered by the WMP, which covers nearly 9,400,000 acres and includes the entire Northern Region of the proposed Project; and 74,132 acres of desert bunchgrass grassland habitat (a.k.a. desert stipa habitat) are estimated to be present within the State of California (CDFG 1995, BLM 2005). CDFG considers stands dominated by valley needlegrass or desert stipa rare or unique, and worthy of consideration (CDFG 2007).

Bigcone Douglas Fir-canyon Oak Forest Habitat

This plant community occurs within the central portion of the proposed Project alignment on NFS lands. Construction of the proposed Project would result in the loss of approximately ~~13~~ 6 acres of bigcone Douglas fir-canyon oak forest habitat. Thus, ~~two~~ one percent of the approximately 494 acres of bigcone Douglas fir-canyon oak forest habitat occurring within mapped areas along the central portion of the proposed Project within the ANF would be affected. The CNDDB estimates that there are approximately 84,570 acres of bigcone Douglas fir-canyon oak forest present within the State of California (CDFG 1995), whereas the ANF has an estimated 34,068 acres of Bigcone Douglas fir and of this about 5.67 acres (0.02%) will be affected. Bigcone Douglas fir is endemic to California and only commonly occurs within southern California (CalFlora 2007) in the Transverse, San Jacinto, and southern Coast Ranges.

Canyon Live Oak Forest, Interior Live Oak Scrub, and Coulter Pine Forest Habitat

These vegetation types are restricted to the Central Region of the proposed Project. Construction activities associated with the proposed Project would result in the loss of approximately ~~41~~ 8 acres of canyon live oak forest habitat, ~~4~~ 2 acres of interior live oak scrub habitat, and ~~3~~ 1 acre~~s~~ of Coulter pine forest habitat. Data compiled from the CNDDB lists 428,975 acres of canyon live oak forest habitat; 669,408 acres of interior live oak scrub habitat; and 100,078 acres of Coulter pine forest habitat as occurring within the State of California (CDFG 2005). In the ANF there are approximately 44,073 acres of canyon live oak forest habitat; 84 acres of interior live oak scrub habitat; and 3,115 acres of Coulter pine forest habitat of which 8.3 acres (0.02%), 2.49 acres (3%), and 1.47 acres (0.05%) respectively, will be affected. In addition, as a relative index of availability, approximately 584 acres of canyon live oak forest habitat, 106 acres of interior live oak scrub habitat, and 105 acres of Coulter pine forest habitat were included in mapping efforts for the proposed Project. The approximate loss of these habitats relative to their overall availability in the Project area is ~~3~~ 1 percent for Coulter pine forest habitat, ~~4~~ 2 percent for interior live oak scrub, and ~~7~~ 1 percent for canyon live oak forest habitat. Regionally, much of this habitat is not likely to be developed as it is under State or federal ownership.

Coast live Oak Woodland Habitat

This habitat is restricted to southern portions of the proposed Project and along the southern border of the ANF. Loss of approximately 14 acres of coast live oak woodland habitat would occur as a result of the proposed Project. This habitat is locally and regionally abundant and only two percent of the approximately 584 acres of coast live oak woodlands mapped within the proposed Project area will be

affected. Data compiled from CNDDB lists 289,608 acres of coast live oak woodland habitat as occurring within the State of California (CDFG 1995). While this habitat is regionally abundant, it is important foraging and nesting habitat for a variety of wildlife including spotted owl. In addition, this habitat provides valuable mast (acorn) crops which are important to foraging wildlife, such as quail or squirrels. Coast live oak woodland habitat is very slow growing and even modest impacts may take years to replace.

California Bay Woodland Habitat

This vegetation type was mapped on the ANF and occurs in riparian areas. Approximately 0.09 acre of California bay woodland would be permanently impacted by the proposed Project. This constitutes approximately 0.9 percent of the 10 acres mapped within the Project area. No California bay woodland would be temporarily impacted. This vegetation type is not regionally abundant, and it is considered rare and worthy of consideration by the CDFG. It is also important foraging and nesting habitat for a number of species. Because this habitat is rare, SCE shall mitigate for the loss of California bay woodland through restoration, enhancement, and/or preservation of existing habitats at a 5:1 (acres mitigated:acres impacted) ratio.

Restoration – California Buckwheat Habitat

This vegetation type was mapped at helicopter staging area SCE #10 on the ANF. This site was apparently seeded with California buckwheat and perhaps other species for reclamation or erosion control, and California buckwheat dominates the site. The entire 7.46 acres of this habitat mapped in the project area would be temporarily disturbed during the construction of the helicopter staging area, but would be restored once construction in this area is complete.

Riversidean Alluvial Fan Sage Scrub Habitat

This community type is present on river terraces at the border of the ANF. Implementation of the proposed Project would result in the loss of approximately one acre of Riversidean alluvial fan sage scrub habitat. This habitat, while once abundant, has been lost through widespread urbanization and flood control activities in drainages such as the San Gabriel River. Mapping along the proposed Project shows approximately 45 acres of Riversidean alluvial fan sage scrub habitat. Thus, a loss of one acre represents about two percent of this habitat mapped along the proposed Project. Losses within the proposed Project will primarily affect a subset of this habitat type termed the "pioneer zone" (Smith, 1980), which mainly occurs on frequently scoured channel bottoms (see Appendix H of the *Biological Specialist Report* [Aspen and H.T. Harvey & Associates, 2009~~8~~], Vegetation Type Descriptions). CDFG regards Riversidean alluvial fan sage scrub as rare and worthy of consideration (CDFG, 2003a). Because this vegetation type is in decline, the loss of even small areas is considered adverse. Where avoidance of impacts is not feasible, SCE shall mitigate through the restoration, enhancement, and/or preservation of existing Riversidean alluvial fan sage scrub.

Coastal Sage Scrub Habitat

Coastal sage scrub is present within southern portions of the proposed Project (e.g., Chino and Puente Hills), as well as on lower elevation slopes within the southern portion of the ANF. Loss of approximately 38 acres of coastal sage scrub habitat would occur as a result of the proposed Project. This habitat is regionally abundant. For reference, only four percent of the approximately 869 acres of coastal sage scrub habitat mapped within the proposed Project would be affected. However, this habitat provides a unique vegetation structure and set of foraging resources that supports certain avian species including

the State and federally listed California gnatcatcher, and has experienced rapid decline in the past decade from increasing development of coastal areas within southern California and increased fire intervals causing type conversion to non-native annual grasslands. SCE intends to avoid impacts to this habitat through redesign of tower locations, spur roads, pulling locations, and staging areas. Where avoidance of impacts is not feasible, SCE shall mitigate through the restoration, enhancement, and/or preservation of existing habitats.

Riparian Vegetation

Impacts to riparian vegetation are discussed under Impact B-2 (The Project would result in the loss of desert wash or riparian habitat) below.

Annosus Root Disease

During the clearing and grading of existing roads, helicopter landing pads, tower locations, staging areas and other locations SCE would cut or remove native trees. This can expose otherwise healthy trees in adjacent areas to Annosus root disease, or fomes annosus (*Heterobasidion annosum*), a fungus that attacks a wide range of woody plants causing a decay of the roots and butt and the death of sapwood and cambium. All conifer species and many hardwood species in California are susceptible to the fungus. The fungus can become established in freshly cut tree stumps through airborne spores and then spread to remaining trees nearby through the conifer's root systems. The disease spreads outward, killing trees in a circular pattern until they reach barriers, such as openings or non-susceptible plants. Once fomes annosus is established in an area, it is easily spread from freshly cut stumps to adjacent trees (USDA, 2005). The fungus can remain alive for as long as 50 years in the roots and stumps. Because the disease results in mortality of trees, it can create hazard trees, deplete vegetative cover, and result in adverse effects to wild land ecology (USDA, 2005).

Regional direction states the best form of management for this root disease is prevention, including treatment of freshly-cut conifer stumps with registered products such as Sporax. The FS Manual (FSM 2303.14 R5 supplement 2300-92-1), FS Handbooks (FSH 2109.14 and FSH 3409.11-94-1), and the ANF Management Plan (Vegetation Management Standard S5) require treatment of all conifer stumps in recreation areas and provide direction and guidance for its use. The application of Sporax to freshly cut stumps significantly reduces the risk of fomes annosus infestation to adjacent conifers.

To reduce the effects of fomes annosus on native trees SCE would implement Mitigation Measure B-1c (Treat cut tree stumps with Sporax). The active ingredient in Sporax is borax, a naturally occurring mineral made of sodium, boron, oxygen, and water. Borax is virtually nontoxic to humans, birds, fish, and to aquatic invertebrate animals. Sporax would be applied in localized treatments, has low toxicity, and would not be used during rain events. Based on this, use of Sporax to prevent the spread of fomes annosus would not result in adverse impacts to plants or wildlife.

Implementation of the proposed Project would result in permanent, temporary, and long-term temporary effects to both native and non-native vegetation communities. SCE has indicated that the APMs, described in Table 3.4-16, would be implemented as part of the proposed Project to avoid or minimize impacts to native vegetation communities: APM BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-6, and BIO-7. These APMs include avoiding or compensating for impacts to vegetation communities, personnel training, restricting work to within predetermined limits of construction, implementing Best Management Practices (BMPs), construction monitoring, flagging vegetation for avoidance, and revegetation with appropriate seed mixes.

As proposed the APMs do not provide mitigation ratios, do not specify time for the habitat restoration monitoring, state that only the Regulatory Agencies must be consulted on various issues, do not identify BMPs, and do not specify what elements would be included in a Revegetation Plan. Because the APMs are not considered to be adequate, mitigation measures are presented to further reduce impacts of the proposed Project on vegetation communities. Implementation of Mitigation Measure B-1a (Provide Restoration/Compensation for Impacts to Native Vegetation Communities) would reduce impacts of the Project and include mitigation ratios developed in consultation with the FS, USACE, CDFG, and CPUC. This measure also provides more specific information on the required Revegetation Plan, and includes the FS, USACE, CDFG, and CPUC, and Chino Hills State Park (on Park Lands only) as approving agencies. It should be noted that mitigation requirements and mitigation ratios for common habitats located outside of NFS lands are focused primarily on the restoration of temporarily disturbed areas and the control or spread of exotic and noxious weeds. To further reduce impacts of the proposed Project on the plant communities above, SCE shall also implement Mitigation Measures B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-1

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** The intent of this mitigation measure is to require SCE to restore disturbed sites to pre-construction conditions or the desired future conditions per the Angeles National Forest (ANF), Land Management Plan (LMP). Prior to construction SCE shall have a qualified biologist, where concurrence on the biologist has been provided by the CPUC and FS, document the community type and acreage of vegetation that would be subject to project disturbance. Impacts to all oaks and native trees (with >3 inch diameter at breast height [DBH]) will be documented by identifying the species, number, location, and DBH. On non-Federal lands all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance. Tree removal shall not be permitted until replacement trees have been planted or transplanting sites are approved.

For NFS lands, the FS shall prepare a Habitat Restoration and Revegetation Plan in discussion with SCE for the Project, which shall include plans for restoration, enhancement/re-vegetation and/or mitigation banking. For non-Federal lands SCE shall prepare the Habitat Restoration and Revegetation Plan. ~~The~~ Both plans shall include at minimum: (a) the location of the mitigation site (off site mitigation may be required); (b) locations and details for top soil storage (c) the plant species to be used; (d) seed and cutting collecting guidelines; (d) a schematic depicting the mitigation area; (e) time of year that the planting will occur and the methodology of the planting; (f) a description of the irrigation methodology for container, bareroot or other planting needing irrigation; (g) measures to control exotic vegetation on site; (h) success criteria; (i) a detailed monitoring program; j) locations and impacts to all oaks and native trees (over 3 inches DBH), k) locations of temporary or permanent gates, barricades, or other means to control unauthorized vehicle access on access and spur roads as deemed necessary by the FS (NFS lands only).

SCE shall utilize a CPUC/FS/USACE/State Parks (for Alternative 4 only)-approved locally collected seed mix, locally collected cuttings, bare-root stock, etc. to revegetate areas disturbed by construction activities. All habitats dominated by non-native species prior to Project disturbance shall be revegetated using appropriate native species. FS approval is required for seeding on NFS land. The seed mix shall consist of native, locally occurring species collected

from local seed sources. Cuttings and bare-root stock shall be of local origin. Restoration shall include the revegetation of stripped or exposed work sites and/or areas to be mitigated with vegetation native to the area. No commercially purchased seeds, stock, etc will be accepted without the approval of the FS on NFS lands and must be certified to be free of noxious weeds. Revegetation shall include ground cover, grass, shrub, and tree species in order to match disturbed areas to surrounding conditions and to restore or improve wildlife habitat quality to pre-project or higher levels. The Habitat Restoration and Revegetation Plan shall also include a monitoring element. Post seeding and planting monitoring will be yearly from years one to five and every other year from years six to ten, or until the success criteria are met. SCE shall restore temporarily disturbed areas, including existing tower locations that are to be removed by the Project, to pre-construction conditions or the desired future conditions per the LMP. If the survival and cover requirements have not been met, SCE is responsible for replacement planting to achieve these requirements. Replacement plants shall be monitored with the same survival and growth requirements as previously mentioned.

The FS will conduct a preconstruction evaluation of the probable impacts to all oaks and native trees in all construction-related disturbance areas. This evaluation shall be incorporated into the Habitat Restoration Plan and shall include the species and number of individuals, their DBH, location and potential impact type. Construction within the driplines of all native trees and oak trees/shrubs, and incidental trimming or damage to trees along the proposed access/spur routes shall not occur until the trees are evaluated by an FS botanist or qualified arborist. This person shall identify appropriate measures to minimize tree loss, such as the placement of fence around the dripline, padding vehicles, minimizing soil removal or addition around driplines, and the placement of matting under the existing dripline during construction activities. On the ANF, if a tree must have any construction-related activities such as equipment or soil staging within the drip zone, root pruning, or excessive branch pruning (greater than 25% in one year), then the tree must be monitored for five years for tree mortality. If any of these identified trees dies during the monitoring period, then the tree must be mitigated at the rate appropriate to the DBH.

The replacement ratios (using rooted plants in liners or direct planting of acorns [for oaks]) for native trees or any oaks which are to be removed shall be as follows: trees ~~less than~~from 3 to 5 inches DBH shall be replaced at 3:1; trees from 5 to 12 inches shall be replaced at 5:1; trees from 12 to 24 inches shall be replaced at 10:1; trees from 24 to 36 inches shall be replaced at 15:1; and all oaks greater than 36 inches shall be replanted at a ratio of 20:1. The replacement ratio for damaged trees shall be 2:1 for trees with DBH less than 12 inches and a 5:1 ratio for trees with DBH greater than 12 inches. The DBHs for scrub oaks will be measured ~~using~~ following DFG guidelines. On the ANF any oak or native tree which must be removed or killed as a result of construction or other Project-related activities shall be replaced in kind or mitigated at a comparable value. Compliance shall be evaluated annually for years one to five and bi-annually for years six to ten (years after tree planting). Trees shall be planted at locations acceptable to the landowner or managing agency. All planting locations, procedures, and results shall be evaluated by a qualified arborist and FS botanist. On non-Federal lands all protection and replacement measures shall be consistent with applicable local jurisdiction requirements, such as the Los Angeles County Oak Tree Ordinance.

Permanent impacts on federal lands shall be determined by the appropriate federal manager (FS and USACE) and on non-federal lands shall be determined by the CPUC at the ratios stated below or at a comparable value. On NFS lands impacts will be considered permanent if they are not likely to recover after ten years post-disturbance. Where onsite restoration is planned for mitigation of temporary impacts to vegetation communities, SCE shall identify a Habitat

Restoration Specialist, where concurrence has been provided by the CPUC/FS, to implement the method of restoration outlined by the FS in the Habitat Restoration Plan.

The creation or restoration of habitat shall be monitored annually for years one to five on both FS lands and private/State/USACE lands and bi-annually for years six to ten on FS lands, or until the success criteria are met, after mitigation site construction to assess progress and identify potential problems with the restoration site. Remediation activities (e.g. additional planting, removal of non-native invasive species, or erosion control) shall be taken during the ten-year period if necessary to ensure the success of the restoration effort. If the mitigation fails to meet the established performance criteria after the ten-year maintenance and monitoring period, monitoring and remedial activities shall extend beyond the ten-year period until the criteria are met or unless otherwise specified by the CPUC/FS/USACE/State Parks (as appropriate). If a fire occurs in a revegetation area within the ten year monitoring period, SCE shall be responsible for a one-time replacement. If a second fire occurs, no replanting is required, unless the fire is caused by SCE activity. Off-site mitigation for NFS and non-NFS lands may be required if mitigation rates exceed what can be achieved on NFS land. This may be in the form of funding for land purchase for inclusion into the Angeles National Forest, mitigation banking, removing existing structures, or comparable restoration efforts.

During and after construction, FS-identified entrances to access roads on NFS lands shall be gated or blockaded in some manner and maintained to prevent the unauthorized use of these roads by the general public. Signs prohibiting unauthorized use of the access roads shall be posted on these gates.

Mitigation Ratios for Impacts to Vegetation Communities

Vegetation Community	Mitigation Ratios – Non-NFS Lands		Mitigation Ratios – NFS/Federal Lands	
	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts
Woodland Vegetation				
Bigcone Douglas Fir-Canyon Oak Forest	1:1	2:1	2:1	5:1
Canyon Oak Forest	-	-	1:1	5:1
California Bay Forest	1:1	2:1	1:1	5:1
California Walnut Woodland	1:1	1.5:1	-	-
Coast Live Oak Woodland	1:1	1.5:1	1:1	5:1
Coulter Pine Forest	-	-	1:1	3:1
Joshua Tree Woodland	1:1	2:1	-	-
Mojavean Pinyon Woodland	1:1	2:1	2:1	5:1
Non-native Woodland	~~0~~1:1*	~~0~~1:1*	~~0~~1:1*	~~0~~1:1*
Yellow Pine Forest (Plantation)	-	-	1:1	3:1
Shrub-dominated Vegetation				
Big Sagebrush Scrub	1:1	1:1	1:1	3:1
Coastal Sage Scrub	1:1	1.5:1	2:1	5:1
Desert Saltbush Scrub	1:1	1:1	-	-
Chamise Chaparral	-	-	1:1	3:1
Mixed Chaparral	1:1	1:1	1:1	3:1
Scrub Oak Chaparral	-	-	1:1	5:1
Interior Live Oak Scrub	-	-	1:1	5:1
Mojave Creosote Bush Scrub	1:1	1:1	-	-
Mojave Mixed Woody Scrub	1:1	1:1	-	-
Mojavean Juniper Woodland and Scrub	1:1	1.5:1	2:1	5:1
Mojavean Pinyon and Juniper Woodland, Recently Burned	-	-	2:1	5:1

Mitigation Ratios for Impacts to Vegetation Communities				
Vegetation Community	Mitigation Ratios – Non-NFS Lands		Mitigation Ratios – NFS/Federal Lands	
	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts
Mulefat Scrub	1:1	3:1	2:1	5:1
Rabbitbrush Scrub	1:1	1:1	-	-
Restoration – California Buckwheat Scrub	-	-	1:1	1:1
Riversidean Alluvial Fan Sage Scrub	1:1	3:1	2:1	5:1
Riparian Vegetation				
Desert Wash	1:1	3:1	2:1	5:1
Ruderal Wetland	~~0~~1:1*	~~0~~1:1*	-	-
Exotic-Giant Reed	~~0~~1:1*	1~~0~~:1*	10:1*	10:1*
Southern Arroyo Willow Riparian Forest	1:1	3:1	2:1	5:1
Southern Coast Live Oak Riparian Forest	1:1	3:1	2:1	5:1
Southern Cottonwood Willow Riparian Forest	1:1	3:1	2:1	5:1
Southern Sycamore-Alder Riparian Forest	1:1	3:1	2:1	5:1
Southern Willow Scrub	1:1	3:1	2:1	5:1
Sparsely Vegetated Streambed	1:1	3:1	2:1	5:1
Herbaceous Vegetation				
Bunchgrass Grassland	1:1	1.5:1	-	-
California Annual Grassland	1:1	1:1	1:1	3:1
Deerweed and Chia Herbaceous Field, Recently Burned	1:1	1:1	2:1	3:1
Desert Bunchgrass Grassland	1:1	1.5:1	-	-
Wildflower Field	1:1	1:1	2:1	3:1
Anthropogenic Vegetation				
Agriculture	0:1	0:1	-	-
Barren/developed	~~0~~1:1*	~~0~~1:1*	~~0~~1:1*	~~0~~1:1*
Ruderal Grassland	~~0~~1:1*	~~0~~1:1*	~~0~~1:1*	~~0~~1:1*
Ratios on Non-NFS Lands may be adjusted based on existing site conditions and disturbance levels with approval of the CPUC. Ratios could range from 0.5 to maximum noted in this Table based on site evaluation. *Non-native habitats will be reseeded with a native seed mix. Barren areas will be mitigated at a 1:1 ratio if they are determined to support sensitive wildlife (i.e. burrowing owls, etc.)				

B-1b **Implement a Worker Environmental Awareness Program.** A Worker Environmental Awareness Program (WEAP) shall be implemented for construction crews by a qualified biologist(s) provided by SCE, where concurrence has been provided by the CPUC/FS prior to the commencement of construction activities. Training materials and briefings shall include but not be limited to: discussion of the Federal and State Endangered Species Acts, Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act; the consequences of non-compliance with these acts; identification and values of plant and wildlife species and significant natural plant community habitats; fire protection measures; sensitivities of working on NFS lands and identification of FS sensitive species; hazardous substance spill prevention and containment measures; a contact person in the event of the discovery of dead or injured wildlife; and review of mitigation requirements. The WEAP shall also include the protocol to be followed when road kill is encountered in the work area or along access roads to minimize potential for additional mortality of scavengers, including listed species such as the California condor. On NFS lands,

road kill shall be reported to the FS or other applicable agency within 24 hours. On non-NFS lands, road kill shall be reported to the appropriate local animal control agency within 24 hours. Training materials and a course outline shall be provided to the CPUC and FS for review and approval at least 30 days prior to the start of construction. Maps showing the location of special-status wildlife, fish, or populations of rare plants, exclusion areas, or other construction limitations (i.e., limited operating periods) will be provided to the environmental monitors and construction crews prior to ground disturbance. SCE shall provide to the CPUC and FS a list of construction personnel who have completed training prior to the start of construction, and this list shall be updated by SCE as required when new personnel start work. No construction worker may work in the field for more than 5 days without participating in the WEAP.

B-1c **Treat cut tree stumps with Sporax.** All stumps of trees (conifers and hardwoods) 3 inches DBH or greater resulting from activities associated with construction of the Project shall be treated with Sporax according to product directions to prevent the spread of annosus root disease. Only licensed applicators shall apply Sporax. Sporax shall not be used during rain events unless otherwise approved by the CPUC/FS/USACE.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

Implementation of the proposed Project would result in the direct and permanent loss of both common and special-status plant communities. Some of the plant communities in the Project area have widespread distributions, are common, and are both locally and regionally abundant. These include:

- Mojave creosote bush scrub
- Mojave mixed woody scrub
- Big sagebrush scrub
- Deerweed and chia herbaceous fields
- Rabbitbrush scrub
- Desert saltbush scrub
- Chamise habitats
- Scrub oak chaparral habitat
- Oak woodlands
- Canyon live oak forest
- Interior live oak scrub
- Coulter pine forest

The loss of plant communities including California annual grassland, ruderal grassland, non-native woodland, agricultural, and barren/developed habitats would typically be considered an adverse but less-than-significant impact (Class III). These communities are locally and regionally abundant and are typically dominated by exotics. Generally, additional mitigation would not be required unless these communities occur within designated critical habitat for a federally listed species (i.e., only critical habitat with constituent elements of the species' habitat, and not developed land, for example) or are known to support special-status plant species or wildlife that utilize these areas for foraging or nesting.

The native plant communities identified above, while not regionally unique and still fairly abundant in the region, still provide valuable foraging and nesting habitat for a suite of wildlife species. Therefore, construction activities that result in the loss of these communities would be considered significant absent mitigation (Class II).

Other communities have more restrictive ranges (e.g., California walnut woodland habitat) or are of limited distribution in the Project region such as Riversidean coastal sage scrub and bigcone Douglas fir. Due to the limited distribution of bigcone Douglas fir and the historic and on-going losses to this

community, the CDFG has designated bigcone Douglas fir habitat as vulnerable to extirpation or extinction (2007). Other communities consist of unique and or important habitats for wildlife (Joshua tree woodland and Mojave juniper woodland and scrub), or have been subject to historic and on-going losses due to grazing, agriculture, and urbanization (e.g. bunchgrass grassland and desert bunchgrass grassland). In addition, some of these communities respond poorly to disturbance and may take decades to recover (e.g., Joshua tree woodland, desert communities, oak woodlands). These include:

- Joshua tree woodland
- Mojave juniper woodland and scrub
- Mojave pinyon woodland
- Mojavean juniper
- Pinyon woodland
- California walnut woodland
- Bunchgrass grassland
- Desert bunchgrass grassland
- Bigcone Douglas fir
- Canyon live oak
- Riversidean coastal sage scrub
- Coastal sage scrub

As described above, with the exception of agricultural or barren/developed land, construction activities that result in the disturbance to the plant communities identified above would be considered a significant impact absent mitigation (Class II). While SCE proposes to implement APM BIO-2 which indicates that a Revegetation Plan would be prepared for native habitats, the APM does not address impacts to annual grasslands or ruderal habitats.

SCE has indicated that the APMs, described in Table 3.4-16, would be implemented as part of the proposed Project to avoid or minimize impacts to native vegetation communities: APM BIO-1, BIO-2, BIO-3, BIO-4, BIO-5, BIO-6, and BIO-7. These APMs include avoiding or compensating for impacts to vegetation communities, personnel training, restricting work to within predetermined limits of construction, implementing Best Management Practices (BMPs), construction monitoring, flagging vegetation for avoidance, and revegetation with appropriate seed mixes.

As proposed the APMs do not provide mitigation ratios, do not specify time for the habitat restoration monitoring, state that only the Regulatory Agencies must be consulted on various issues, do not identify BMPs, and do not specify what elements would be included in a Revegetation Plan. Because the APMs are not considered to be adequate, mitigation measures are presented to further reduce impacts of the proposed Project on vegetation communities. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts of the Project to less-than-significant levels (Class II) and include mitigation ratios developed in consultation with the FS, USACE, CDFG, and CPUC. These measures also provide more specific information on the required Revegetation Plan, and include the FS, USACE, CDFG, and CPUC, and Chino Hills State Park (on Park Lands Only) as approving agencies. It should be noted that mitigation requirements and mitigation ratios for common habitats located outside of NFS lands are focused primarily on the restoration of temporarily disturbed areas and the control or spread of exotic and noxious weeds. For some habitats there is no requirement for SCE to obtain additional habitat to offset the permanent impact.

Impact B-2: The Project would result in the loss of desert wash or riparian habitat.

Riparian and wash communities occur in a variety of the surface water resources that are present in the proposed Project area. Riparian and wash habitat within the proposed Project is highly diverse and encompasses several stand types. These include:

- Desert wash
- California bay forest
- Southern coast live oak riparian forest
- Southern arroyo willow riparian forest
- Southern cottonwood willow riparian forest
- Southern sycamore-alder riparian woodland
- Southern willow scrub

These communities occur in desert washes and other streams, the majority of which support flow only after seasonal rains. However, several large perennial waterways are also present, particularly in the central portion of the Project area on NFS lands. Specific impacts to State and federally protected waters (jurisdictional resources) are discussed in Impact B-39 below.

The primary main drainages within the Northern Region of the proposed Project include: Amargosa Creek, Oak Creek, Cottonwood Creek, and the Santa Clara River. The mountainous watersheds of the Central Region, which occurs primarily on NFS lands, support both rivers and creeks, including Big Tujunga Creek, the San Gabriel River, Santa Clara River, and the Arroyo Seco Creek. The primary drainage feature in the Southern Region is the San Gabriel River, which parallels Segment 7 through the San Gabriel Valley, and Aliso Creek which drains into the Santa Ana River.

In addition, the Project area supports riparian habitat at numerous tributaries and small creeks which run through the Southern and Central regions of the Project area. These include but are not limited to Monte Cristo Creek, an intermittent creek east of Monrovia Peak; drainages near Cold Springs, Upper Big Tujunga, Aliso, Turnbull, and Powder Canyons; in several areas along the Whittier Narrows in the Southern Region; near little Chino Creek; along Amargosa Creek and its unnamed tributaries in the Leona Valley in the Northern Region of the Project; and along unnamed tributaries to Anaverde Creek near Pelona Ridge. In addition, the proposed Project spans a number of small, unnamed drainages that support remnant riparian habitat in the foothill regions of the proposed Project.

Direct impacts to desert wash and riparian habitat would include the temporary disturbance and permanent removal of native vegetation within these communities. The proposed Project will result in the direct loss of approximately 5.2 acres of desert wash habitat, ~~0.3~~0.1 acre of southern cottonwood willow riparian forest, ~~1.5~~1.3 acres of southern sycamore-alder riparian forest, and ~~2~~ 1.6 acres of southern willow scrub habitat. The loss of approximately 0.1 acre of California bay forest, ~~0.5~~0.4 acre of southern coast live oak riparian forest, ~~and 1~~ 0.8 acre of southern arroyo willow riparian forest, and 0.3 acre of sparsely vegetated streambed would also occur during the course of access road widening, spur road construction, and grading for helicopter staging areas. In addition, riparian habitat would be impacted by the reconstruction of the crossing of the Segment 11 access road 3N27 and Big Tujunga Creek on the ANF. This area supports a mosaic of riparian vegetation dominated by southern sycamore – alder riparian forest. Because final engineering has not yet been conducted, actual impacts at this location cannot be quantified; however, it is estimated that approximately one acre of riparian habitat would be impacted during the reconstruction of the crossing.- On non-NFS lands, approximately 1.3 acres of ruderal wetland and 0.02 acre of exotic – giant reed habitat would be impacted, but would be restored with native riparian vegetation.

Indirect impacts to these communities would be similar to those discussed for native vegetation communities (Impact B-1), above. These would include increased sediment transport, alterations to existing topographical and hydrological conditions, fugitive dust accumulation, and the introduction of non-native, invasive plant species.

During the construction and operation of the proposed Project, impacts could include trampling and crushing of native plants by increased vehicular and human traffic, increased erosion and sediment

transport, and the introduction of noxious and exotic weeds due to increased human presence. Although the amount of sediment anticipated from construction of this project is negligible, (see Appendix A [GIS-Based Soil Erosion & Sedimentation Analysis Report] of the Hydrology and Water Quality Specialist Report for the TRTP), if BMPs are not implemented localized sediment could affect riparian vegetation.

Desert wash habitat occurs primarily within the Northern Region of the proposed Project (Segment 10) and is a ~~limited~~ relatively common resource in parts of the Antelope Valley. This resource is also present in the Kentucky Springs Canyon region north of and transitioning into the ANF. Approximately 269 acres of desert wash was mapped in the Project ~~footprint~~ area and the loss from construction of the proposed Project represents a reduction of approximately two percent of the mapped resource. Activities associated with the construction of transmission line towers and roads, pulling stations, and staging areas could substantially degrade and remove desert wash habitat within the Project ~~boundaries~~footprint. Although this unique hydrogeomorphic landform is relatively common in parts of the Antelope Valley, much of this habitat has been lost over the last several decades due to development and agricultural practices, particularly in undeveloped portions of the Project area where off-road vehicle paths and paved roads transect desert washes. Desert wash habitats play an important role in conveying surface flows during the rainfall season to other habitats located down slope that support special-status plants such as the alkali mariposa lily.

Approximately 10 acres of California bay forest habitat, 69 acres of southern coast live oak riparian forest habitat, 39 acres of southern arroyo willow riparian forest habitat, 29 acres of southern cottonwood willow riparian forest habitat, 72 acres of southern sycamore-alder riparian woodland habitat, and 90 acres of southern willow scrub habitat occurs in several areas of the proposed Project. Project impacts would represent ~~an average range from approximately~~ less than one percent for southern cottonwood willow riparian forest, California bay forest, ~~and~~ southern coast live oak riparian forest, and ~~to three percent for~~ southern arroyo willow riparian forest. Due to its ability to support wildlife and the ongoing loss of riparian habitat state wide, CDFG considers riparian habitat to be worthy of consideration, both in general and within each of the specific habitats listed above (CDFG, 2003a).

Some riparian habitat would be impacted from the expansion of the existing access roads. Direct impacts could include removal of wetland/riparian vegetation and/or filling of jurisdictional areas to create stream crossings, particularly in the ANF. Examples of indirect impacts to jurisdictional resources include stream bank erosion and stream sedimentation. Any activities that involve modification of the bed or bank of a State or U.S.-jurisdictional waterway would be regulated by the CDFG, Regional Water Quality Control Board (RWQCB), and USACE. On NFS lands no activities can occur within designated Riparian Conservation Areas (RCAs) without approval from the FS.

Riparian Conservation Areas (RCAs)

An RCA is defined as "an area delineated next to water features requiring special management practices to maintain and/or improve watershed and riparian-dependent resource conditions" (USDA, 2005). Therefore, any riparian areas having important biological and/or hydrologic riparian characteristics within the Project area were identified by the FS as RCAs using the Five-Step Project Screening Process for Riparian Conservation Areas (a detailed description of the Five-Step Process and methods utilized to assess affects to RCAs is presented in the *Riparian Conservation Area Report for the Tehachapi Renewable Transmission Project*).

In general, RCAs include areas containing both aquatic and terrestrial components, and serve as the interface between land and water. Specifically, RCAs can include lands adjacent to perennial,

intermittent, or ephemeral streams as well as in and around meadows, lakes, reservoirs, ponds, wetlands, vernal pools, seeps, springs, and other water bodies. These areas are especially important as they are where terrestrial and aquatic systems interact and slope and fluvial processes are tightly interconnected. Water is a limited resource on the ANF and plays an important role in the life histories of many forest dependant species, especially in the semi-arid setting of southern California. As such RCAs are unique areas that support a high diversity of plant and animal species and typically have a high degree of endemism including threatened and endangered species. The variety of wildlife species associated with RCAs on the ANF is high and these species use these areas for breeding, aestivation, foraging, refugia, and as movement corridors (USDA, 2005).

To provide for the management of species that use riparian areas, each RCA has a buffer area of associated upland habitat which corresponds to the unique life history of the species. The size of an RCA is determined by characteristics such as topography, species present, and connectivity to other RCAs. For example, large intermittent and perennial streams dominated by riparian vegetation may support numerous special-status plants and wildlife. These buffers may extend from 30 m to over a mile depending on~~f~~ the ~~type of~~ species that inhabit~~s~~ the RCA. However, even small drainages that may have water for only a short period of time can be crucial resources for breeding (i.e., amphibians and birds), foraging, or wildlife movement corridors. Within the Project area several RCAs support threatened and endangered species including the arroyo toad.

Actions conducted within an RCA must meet specific criteria defined by the FS which include both biological and watershed goals and functions. In addition, actions that result in effects considered other than~~t~~ neutral or beneficial may not be conducted without an amendment to the existing Forest Plan (USDA 2005). Table 3.4-19 provides a concise list of the RCAs that occur within the ANF and those that would require a Plan Amendment.

Table 3.4-19 RCA Crossing Points Summary

Drainage Type	Crossing Type	Total	Non-Conformity to Forest Plan
ROAD CROSSINGS			
Perennial	Arizona	2	2
	Paved Arizona	2	2
	Washout – no crossing	1	1
Intermittent	Arizona	44	35
	Paved Arizona	8	3
	CMP	12	6
	Concrete Culvert	1	1
Ephemeral	Arizona	84	38
	Paved Arizona	4	2
	CMP	12	5
	Concrete Culvert	1	0
	Subtotal	171	95
LINE CROSSINGS*			
Perennial	N/A	7	0
Intermittent	N/A	63	0
Ephemeral	N/A	26	0
	Subtotal	96	0
	Total	267	95

*Line crossings were determined by aerial photography and are indicated as such (Figure 3.4-6)

Over 265 RCAs were identified during field assessments for the proposed Project on NFS lands. These RCAs fall within the transmission line ROW or along access roads that would be used and upgraded during construction of the proposed Project. Approximately 96 RCAs occur where the transmission line crosses a substantial stream or drainage. One hundred and seventy-one occur where access or spur roads

cross ephemeral, intermittent, or perennial drainages. While riparian areas are considered on both NFS lands and non-NFS lands, RCAs are defined only for the ANF as required by the Forest LRMP. Of the 267 RCAs that occur on NFS lands, 95 would be subject to Project impacts that would not conform to the Forest Plan. These impacts would occur from road grading, tree removal, stream diversion, or similar actions. ~~Other than~~Any action that does not have neutral or beneficial ~~effects~~ impacts to these resources is not considered to be consistent with the existing Forest Plan (USDA, 2005) ~~FS guidelines~~ and would require the completion of a Forest Plan Amendment.

RCAs that could be impacted by the proposed Project include a wide range of riparian areas, from ephemeral drainages high in a watershed that contain chaparral or other xeric plant communities to perennial streams surrounded by mature riparian forest. The single largest impact to RCAs from the proposed Project would occur from the widening of the access roads to 16 feet and the construction of new spur roads. Widening of the access roads in some cases would remove riparian vegetation, including mature oak trees, alders and other riparian trees. In some areas only limited riparian vegetation would be removed where an RCA supports only ephemeral or intermittent flows such as portions of Mill or Alder Creeks. However, in other areas including Monte Cristo Creek, Big Tujunga, Alder, and Lynx Gulch large areas of riparian habitat within designated RCAs would be removed to support vehicle traffic, water crossing construction, and heavy equipment. Currently SCE has proposed to construct a new all-weather crossing at the washed-out structure on Big Tujunga River near the Falls Creek crossing~~. In addition, SCE would upgrade the existing damaged crossing at the San Gabriel River crossing. Both these~~ This action~~s~~ would involve major construction activities within a perennial waterway~~s~~, but the acreage associated with this disturbance is unknown pending final engineering plans. However, it is estimated that approximately one acre of riparian vegetation would be impacted at this location. The removal of vegetation in these areas would conflict with FS guidelines for the protection of RCAs. ~~However, sediment analysis shows that the amount of sediment anticipated from construction of this project is negligible (see Appendix A [GIS Based Soil Erosion & Sedimentation Analysis Report] of the Hydrology and Water Quality Specialist Report for the TRTP).~~

Road expansion could also result in the mobilization of large quantities of sediment that could enter nearby or adjacent RCAs. However, sediment analysis shows that the amount of sediment anticipated from construction of this project is negligible (see Appendix A [GIS-Based Soil Erosion & Sedimentation Analysis Report] of the *Hydrology and Water Quality Specialist Report* for the TRTP). These impacts would continue to occur throughout the construction phase of the proposed Project, as the dirt access roads that would be utilized are often adjacent to scree-covered slopes that drop debris across the road, are blocked by fallen trees, or are subject to landslides that prevent access. Therefore, road maintenance including periodic grading would occur throughout construction. As RCAs consist of riparian areas and their adjacent upland habitats, these areas support a wide variety of both plants and wildlife.

A formal delineation of each riparian area would be conducted and SCE would apply for permits from the USACE, RWQCB, and CDFG for activities in riparian habitat. In addition, no activities would be allowed within any RCA without the concurrence of the Forest. In accordance with the Clean Water Act, there would be no net loss of wetlands from the implementation of the proposed Project. As such, SCE would mitigate permanent and temporary impacts at a minimum 1:1 ratio for riparian vegetation (Mitigation Measure B-1a). Mitigation would include restoration, enhancement, and/or compensation, as appropriate.

Where avoidance of impacts is not feasible SCE shall mitigate through the restoration, enhancement, and/or preservation of existing riparian corridors. SCE has indicated that impacts to jurisdictional waters

and wetlands would be minimized or avoided through the implementation of APMs, identified in Table 3.4-16. These include APM BIO-3, APM BIO-4, APM BIO-5, APM BIO-6 and APM BIO-7. These APMs include avoiding or compensating impacts to jurisdictional waters and wetlands, implementation of best management practices, biological monitoring, personnel training, and coordinating and compensating for impacts to habitats. However, as described above these APMs lack specificity and clearly defined monitoring requirements, do not provide defined mitigation ratios, and defer the analysis to a later date. As such, to reduce impacts of the proposed Project on riparian and wash habitats, SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-2

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** SCE shall not construct or modify any structure, culvert, or bridge or modify any habitat without the appropriate permits from regulatory agencies. SCE shall not construct or modify any structure, culvert, or bridge or modify any habitat on NFS lands in Riparian Conservation Areas (RCAs) without the authorization of the FS. Vegetation removal or road construction shall not occur in RCAs during the breeding season for nesting birds (February 1-August 15) unless otherwise approved by the FS. SCE shall prepare and implement a FS RCA Treatment Plan for the Project. This Plan shall include the specific activities that will occur at each of the RCA points crossed by the Project including the amount and type of vegetation to be cleared, the type of road crossing or improvement allowed for wet and dry crossings, and the methods that would be employed to reduce the effects of the Project on water quality. The Plan shall include timing restrictions for vehicle or equipment passage, restrictions on what activities may occur such as grading, vegetation removal or tree trimming, monitoring requirements, seasonal restrictions, and restoration requirements. This Plan shall be submitted to the FS for approval prior to construction or the grading of any access road. The Plan shall also be submitted to the CPUC for review.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

In California more than 95 percent of riparian habitats that were present prior to European settlement have been severely degraded or destroyed (Smith, 1977; Katibah, 1984). While these habitats constitute only a small fraction of the proposed Project area and a low percentage of the total landscape (often less than one percent), they typically accommodate a disproportionately high number of species and provide a larger degree of ecological function than surrounding upland areas (Fischer and Fischenich, 2000). Many aquatic and semi-aquatic species rely on adjacent terrestrial habitats to complete their life cycles (Semlitsch and Bodie, 2003; Spinks et al., 2003; Burke and Gibbons, 1995) and riparian vegetation provides necessary foraging and nesting habitat for many bird species (Rottenborn, 1999; Bolger et al.,

1997). In arid regions such as southern California, riparian habitats play a particularly crucial role in maintaining biodiversity because up to 80 percent of vertebrate species rely on them for at least part of their lifecycle (Knopf et al., 1988) and because of the central role riparian habitats play in a variety of ecological functions (Rottenborn, 1999; Fischer and Fischenich, 2000). In the Antelope Valley, large areas of desert wash habitat have been subject to ongoing development. Therefore, because of the overall loss of desert wash and riparian habitat within California, its role in the functional hydrological connectivity of habitats, and its suitability to support several special-status species, the loss of this habitat associated with the proposed Project is significant without mitigation. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant **(**Class II**)**. Adequate mitigation would be achieved through the restoration of disturbed areas and acquiring lands to replace functional habitat values.

Noxious and Invasive Weeds

The term "noxious weeds" includes all plants formally designated by the U.S. Secretary of Agriculture or other responsible State official as such, and these species usually possess one or more of the following characteristics: "aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and being not native or new to or not common to the United States or parts thereof" (FS Manual 2080.5, 1995).

The introduction of noxious and invasive weeds species is a special concern for native plant communities and is recognized by the FS as a threat to native vegetation communities and wildlife. Noxious and invasive weeds pose a threat to the natural processes of plant community succession, fire frequency, biological diversity and species composition. Noxious and invasive weeds can affect the persistence of some populations of special-status species by replacing the foraging base, altering habitat structure, or excluding a species by vegetative growth.

Several noxious weeds, as defined by the California Invasive Plant Council (Cal-IPC) or the FS, already exist within or near the proposed Project in well-established populations, often clearly associated with a source of disturbance. The Northern Region contains large areas of nonnative annual grasslands, especially where historic and current grazing occurs. In the Central Region of the Project site, the non-native species Spanish broom forms dense colonies along roadsides and other disturbed areas. In the Southern Region of the proposed Project, black mustard (*Brassica nigra*) dominates large areas of grasslands, forming large monocultures that affect native species. Other major stands of noxious weeds identified in surveys of the proposed Project included, but were not limited to, castor bean (*Ricinus communis*), giant reed (*Arundo donax*), and cheat grass (*Bromus tectorum*). A detailed inventory of the noxious and invasive weeds that occur in the vicinity of the proposed transmission line upgrade on the ANF is presented in Appendix A of the *Biological Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~), Noxious Weed Assessment.

Impact B-3: The Project would result in the establishment and spread of noxious weeds.

As described under Criterion BIO1 (Vegetation), the proposed Project would result in both temporary and permanent loss to a variety of native and non-native plant communities (Tables 3.4-17 and 3.4-18). In total the proposed Project would result in the permanent loss of approximately ~~283~~ 350 acres of habitat.

On NFS lands approximately ~~92~~ 110 acres would be permanently lost through the placement of transmission towers and spur roads. The potential introduction or spread of noxious and invasive weeds would occur primarily during construction activities, but would also continue to occur during operation and maintenance phases of the proposed Project. The introduction of noxious and invasive weeds would be related to ground disturbance from clearing and grading, expansion of access roads, construction of spur roads, and road maintenance; the use of vehicles, construction equipment, or earth materials contaminated with non-native plant seed; use of straw bales or wattles that contain seeds of non-native plant species; and enhanced public access to the Project corridor during and after construction. Additionally, weed seeds are often spread on equipment or clothing by construction or maintenance personnel. This would provide many avenues for new propagules (any part of a plant that may generate a new individual plant) to be carried into areas that previously were isolated from sources of noxious weed seeds.

For the purpose of this discussion, Project-related disturbance or impacts to all habitats, even disturbances such as grading for temporary road construction, were treated as permanent in large part due to the foreseeable establishment and spread of noxious weeds and the conversion of native habitats to ruderal habitats (or expansion of existing ruderal habitats) following disturbance. Noxious weeds often become established following disturbance. ~~In~~ For example, in arid sites or in sites with poor nutrient availability noxious weeds may become established following water and/or nutrient addition such as may occur along roadways as a result of increased runoff or nitrogen deposition.

Typically in areas where few exotic species occur, the characteristics of the existing topsoil structure, cryptogammic crusts, or the existing native vegetation prevent weed seeds from germinating. Once soil disturbance has occurred, the soil structure or native biotic components are affected such that these factors no longer preclude the establishment of noxious or invasive weeds. Following establishment, new populations of weeds are often extremely difficult to eradicate~~, especially in arid environments~~. It may take several years or decades to re-establish the native soil structure and biota.

As many noxious weeds occurring in southern California are fast-growing plants adapted to high light conditions, removal of canopy vegetation, either in forests and woodlands or in chaparral and scrub habitats, may release weed seeds present in the seed bank from dormancy and allow them to germinate and establish.

Direct impacts associated with the introduction of noxious weeds could occur when noxious weeds become established in an area. These invasive plant species can cause a permanent or long-lasting change to the environment by increasing vegetative cover, creating a dense layer that prevents native vegetation from germinating, altering the edaphic and hydrological conditions through nitrogen fixation (as in Spanish broom, or may drain the water table (as in giant reed). Noxious weeds can create such an unfavorable environment for wildlife that associate, mutualistic species necessary for native plant life cycles, such as seed dispersers, fossorial mammals, or pollinators, are lost from the area.

Indirect impacts attributed to the colonization of noxious weeds could include a gradual decrease in natural biodiversity as noxious weed infestations may extirpate native plant populations. The lingering effects of herbicide use to remedy noxious weed infestations could adversely impact native plants and wildlife and are discussed in further detail below (Table 3.4-20). Ongoing operational and maintenance impacts could include the facilitation of noxious weed establishment and spread as a result of increased vehicular and human traffic.

Currently SCE does not have a specific APM intended to reduce the spread or establishment of noxious weeds in the proposed Project area. Measures proposed by SCE that would reduce this impact include APM BIO-2, APM BIO-4, APM BIO-5, and APM BIO-6. These APMs include minimizing vegetation removal at construction sites, implementation of best management practices, biological monitoring, personnel training, and coordinating and compensating for impacts to vegetation. However, as described above these APMs lack specificity and clearly defined monitoring requirements, do not clearly address impacts from the spread or establishment of noxious weeds, and do not provide defined mitigation ratios for vegetation loss. Therefore to further reduce impacts of the proposed Project from the spread or establishment of noxious weeds SCE shall implement Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-2 (Implement RCA Treatment Plan), and Mitigation Measures B-3a through B-3c (Prepare and implement a Weed Control Plan, Remove weed seed sources from construction routes, and Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads) to minimize the potential spread of noxious weeds as required by FS Manual 2080.

The rationale for the success of the proposed mitigation strategy for impacts associated with noxious weeds contains a three-part approach. First, SCE shall implement restoration of all areas subject to Project disturbance as defined in Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities). Second, SCE shall implement Mitigation Measure B-3a (Prepare and implement a Weed Control Plan) which requires SCE to adhere to the FS management guidelines for reducing the potential for the introduction of invasive, non-native plant species in the ANF by implementation of the FS Best Management Practices (BMPs) to reduce the potential spread of noxious weed propagules into remote, natural areas, or from roadsides into habitat interiors. The restoration of disturbed areas and general weed management practices such as vehicle cleaning would reduce the spread of noxious weeds on non-NFS lands. The final mitigation components identified in B-3b and B-3c (Remove weed seed sources from construction routes, and Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads) are intended to monitor and control the spread of noxious weeds, as it cannot be assumed that any suite of BMPs will be 100 percent effective in preventing all invasive propagule spread or release of existing noxious weed seed banks from dormancy. This will be required on NFS lands as identified in the Forest Service Guidelines for Noxious Weeds.

Mitigation Measures for Impact B-3

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** SCE shall prepare and implement a comprehensive, adaptive Weed Control Plan on NFS lands for pre-construction and construction invasive weed abatement. The long term Weed Control Plan, including monitoring and eradication, will be defined as part of the 50 year Operations and Maintenance Permit. On the ROW easement lands administered by the FS, the Weed Control Plan shall incorporate all appropriate and legal agency-stipulated regulations. The Weed Control Plan shall be submitted to the FS for final authorization of weed control methods, practices, and timing prior to implementation of the Weed Control Plan on public lands. ROW easements located on private lands shall include adaptive provisions such as wheel and equipment washing for the implementation of the Weed Control Plan. The Weed Control Plan shall include the following:

- A pre-construction weed inventory shall be conducted by surveying all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new or improved access and spur roads. Weed populations that: (1) are rated High or Moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC, 2006); and (2) aid and promote the spread of wildfires (such as cheatgrass, Saharan mustard, and medusa head); and (3) are considered by the FS as species of priority (for NFS lands only) shall be mapped and described according to density and area covered. In areas subject to ground disturbance, weed infestations shall be treated prior to construction according to control methods and practices for invasive weed populations designed in consultation with the FS. The Weed Control Plan shall be updated and utilized for eradication and monitoring post construction.
- Weed control treatments shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the FS~~, and Fish and Wildlife Service where appropriate~~. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the CPUC/FS, and implemented by a Licensed Qualified Applicator.~~ Herbicides shall not be applied in areas containing occupied Threatened, Endangered, Proposed, Candidate, and FS Sensitive/Watch List (TEPCSW) species without further analysis.~~ Herbicides shall not be applied during or within 72 hours of a scheduled rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the FS~~ and if necessary, the FWS~~. In riparian areas only water-safe herbicides shall be used. Herbicides shall not be applied when wind velocities exceed 6 mph. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the FS. The timing of the weed control treatment shall be determined for each plant species in consultation with the FS (on NFS lands)~~ (on NFS lands), PCA, the county Agriculture Commissioners, and Cal-IPC~~ with the goal of controlling populations before they start producing seeds.

For the preconstruction and construction of the Project, measures to control the introduction and spread of noxious weeds in the Project work area shall be taken as follows.

- On the ANF, from the time construction begins until ten years after construction is complete, surveying for new invasive weed populations and the monitoring of identified and treated populations shall be required at all sites impacted by construction (tower pads, staging areas, landing zones, etc.), including access/spur roads disturbed during the Project. Surveying and monitoring for weed infestations shall occur annually for years one to five and bi-annually for years six to ten. Treatment of all identified weed populations shall occur at a minimum of once annually. When no new seedlings or resprouts are observed at treated sites for three consecutive, normal rainfall years, the weed population can be considered eradicated and weed control efforts may cease for that impact site.
- During Project preconstruction and construction, all seeds and straw materials shall be weed-free rice straw, and all gravel and fill material shall be certified weed free by the county Agriculture Commissioners' Offices. Any deviation from this will be approved by a FS botanist. All plant materials used during restoration shall be native, certified weed-free, and approved by the CPUC and FS.
- During Project preconstruction and construction, vehicles and all equipment shall be washed (including wheels, undercarriages, ~~helicopter landing gear,~~ and bumpers) before and after entering FS identified areas. On non-~~federal~~ NFS lands vehicles and equipment

shall be washed prior to commencing work in off road areas. Vehicles shall be cleaned at existing construction yards or legally operating car washes. SCE shall document that all vehicles have been washed prior to commencing project work. In addition, tools such as chainsaws, hand clippers, pruners, etc. shall be washed before and after entering all Project work areas. All washing shall take place where rinse water is collected and disposed of in either a sanitary sewer or landfill, unless otherwise approved by the FS. A written daily log shall be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. The log shall include the signature of a responsible staff member. Logs shall be available to the CPUC and FS for inspection at any time and shall be submitted to the CPUC and FS on a monthly basis.

- During Project operation and maintenance activities, clear and dispose of weeds in assembly yards, helicopter landing areas, tower pads, spur roads, staging areas, and any other disturbance areas in a FS-approved method.

B-3b **Remove weed seed sources from construction access routes.** Prior to construction, SCE shall initiate invasive species eradication identified in the following Table. These populations were identified as small and isolated but having the potential to spread aggressively during construction. Post construction, these isolated populations will be included and treated according to the restoration plan. Per the FSM 2080 BMP guideline, SCE shall also remove or reduce sources of weed seed along the travel routes associated with Project construction identified in Figures A-2 through A-4 of Appendix A of the *Biological Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~) to prevent the introduction or control the spread of noxious weeds by mowing or other control methods to substantially reduce seed production in these infestations during Project construction. Following Project approval and during the time of year when weed species can be observed and identified, SCE shall identify, using a qualified plant ecologist, any other weed seed sources that could contribute to Project-related weed spread on the ANF. The following weed populations, and any other target infestations identified by Project surveys, should be controlled prior to construction. SCE shall initiate eradication of the following weed populations and any other isolated, target infestations discovered during pre-construction surveys along construction routes.

Weed Populations Along Construction Routes*

ANF Road Location	Noxious Weeds Identified
4N41	Isolated patch of Spanish broom
3N20	Isolated patches of Spanish broom, Scotch broom, and rockrose
3N23	Giant reed population in creek adjacent to road
2N23	Scattered Spanish broom infestations of a range of population sizes and densities. Some of the large populations along these routes observed during project surveys had been recently brushed for weed control by SCE contractors, but these populations should be rechecked and control efforts reapplied as necessary. Also isolated patches of tree tobacco, rockrose, horehound, and tocalote.
2N24	Scattered, isolated patches of Spanish broom and rockrose
2N25.2	Scattered, isolated patches of Spanish broom, rosemary, rockrose, and horehound
2N30.1	One isolated patch of Spanish broom
2N30.2	Scattered Spanish broom, bull thistle, tree of heaven, black locust, tocalote, rockrose, eupatory, horehound, smilo grass, and tree tobacco infestations of a range of population sizes and densities.
3N27 north of Big Tujunga Creek to Mt. Gleason Rd	Scattered, isolated patches of Spanish broom
2N45	Moderate patch of giant reed and tree of heaven
2N65.1	Moderate infestation of tree spurge
2N65.2	Moderate infestation of Spanish broom and thoroughwort
2N66	Moderate patch of Spanish broom and tree of heaven

Weed Populations Along Construction Routes*	
ANF Road Location	Noxious Weeds Identified
2N75	Moderate patch of Spanish broom
2N79	Isolated patch of Spanish broom
1N36	Scattered Spanish broom, bull thistle, tree of heaven, black locust, tocalote, rockrose, Canadian thistle, hairy vetch, smilo grass, and tree tobacco infestations of a range of population sizes and densities.
Road west out of Shortcut Station	Isolated patches of Spanish broom
*Specific locations are found in Figures A-2 through A-4 of Appendix A of the Biological Specialist Report Noxious Weed Assessment. [Aspen and H.T. Harvey & Associates, 2009~~8~~]	

B-3c **Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.** Prior to construction and during each year of use for construction at all assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads within the ANF, weed infested areas should be mowed and/or treated as appropriate for the individual weed species under the guidance of a qualified plant ecologist or restoration ecologist, where concurrence on the ecologist has been provided by the FS. Unless otherwise authorized by the FS, weed control efforts in these areas shall be timed annually to reduce shortpod mustard, tocalote, and other noxious weed seed production, by mowing or weed-whacking infestations when flowering has just started, but before seeds have been produced. All plant debris shall be disposed of at a FS/CPUC-approved location. Weed control efforts shall commence in early spring (February – March), as indicated annually by a qualified plant ecologist or restoration ecologist in coordination with a FS botanist or Forest Weed Specialist.

Use of Herbicides to Control Exotic Weeds for Mitigation Measure B-3a

As described under Impact B-3 (The Project would result in the establishment and spread of noxious weeds) several invasive plant species have been detected along the Project ROW. As part of a comprehensive Weed Control Program, several options may be utilized to limit or reduce impacts from invasive plants. To date several methods exist and are regularly prescribed for the eradication of existing weed populations depending on their location and the habitat type they infest. Some of these include herbicide application, mechanical removal, biocontrol methods, prescribed burns or floods, and shading. The removal of established noxious weed populations is best accomplished by species-specific methodologies, which may include a combination of the above removal procedures or precise timing of specific actions. Due to typically large seed banks and the ability of some weed species to vigorously resprout following removal methods, most species require more than one round of treatment, or require a differing follow-up treatment method after the initial removal occurs. A suite of known species-specific control methods is presented in detail in Appendix A of the *Biological Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~) (Noxious Weed Report).

Herbicides are any chemical agents, taken from a broader spectrum of pesticides, which target the specific control or removal of plants. Many weed control programs rely heavily or solely on herbicidal methods, as these are often assumed to present the most efficient and cost-effective opportunities for eradication, especially of large populations. However, herbicides may harm or kill desirable native vegetation occurring in close proximity to or even downstream from the targeted weeds. Additionally, herbicides may be detrimental to wildlife species such as amphibians (Relyea, 2005) or negatively impact water quality. The potential for runoff to streams will need to be determined on a site by site basis according to which biological resources are within each area. To minimize potential impacts, weed control treatments

shall include all legally permitted herbicide, manual, and mechanical methods applied with the authorization of the FS. The application of herbicides shall be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA), where concurrence has been provided by the CPUC/FS, and implemented by a Licensed Qualified Applicator who has been clearly informed of the nature of surrounding native vegetation. Herbicides shall not be applied during or within 72 hours of a scheduled rain event. Herbicides shall not be used within Riparian Conservation Areas (RCAs) on the ANF without approval of the FS. In riparian areas only herbicides specifically approved for use in wetland environments should be used in any area where overspray could potentially be washed into watersheds. Herbicides shall not be applied when wind velocities exceed 6 mph.

~~For these reasons, n~~Noxious weed control measures prescribed as mitigation for Project impacts should be species specific, and herbicides should be applied only if necessary after considering alternate methods or as part of a proven eradication strategy for that weed species. Many weed species require specific timing or methods of herbicidal application (i.e., disturbing a protective waxy cuticle to allow uptake, applying herbicide after the plant has bolted but before seed set, etc.), and if such methods are not followed, it is likely native vegetation will be harmed by herbicidal contamination while the target weed species are left unaffected. ~~Perhaps most importantly, only herbicides specifically approved for use in wetland environments should be used in any area where overspray could potentially be washed into watersheds, and herbicides should be applied by a licensed herbicide applicator who has been clearly informed of the nature of surrounding native vegetation.~~

Because the terrain in several locations throughout the proposed alignment is steep and difficult to access, and several of the weed species present in the ROW and access roads are typically controlled through the use of herbicides, SCE may opt to use herbicides as one component of the Weed Control Program.

While the overall benefits of herbicide use are generally straightforward, herbicide use may have detrimental effects on ecosystem values and functions. As noted in the CNPS Policy on the use of herbicides in situations where native vegetation may be affected, the tradeoff between the benefits and costs of using herbicide – either proven or alleged – has made it difficult for the public at large, CNPS members, other organizations, and public agencies to evaluate whether or not to use herbicides (CNPS, 2008). It is generally desirable to select an herbicide that has low toxicity, will not move from its target or leach into groundwater (low water solubility), and will not remain in the environment for a long period of time (low persistence). Furthermore, the application method selected depends on the type of control needed, the type of vegetation, and the site situation (site conditions and locations). Not all herbicides or application methods are equally appropriate, effective, or safe, given different site conditions and weed species.

There are several exposure scenarios possible for herbicides and wildlife. These include direct spray; indirect contact through grooming or contact with affected vegetation; and, ingestion of contaminated media, including vegetation, prey species, and water. Because of the relationship of body weight to surface area and to the consumption of food and water, small animals will generally receive a higher dose, in terms of body weight, than large animals will receive for a given type of exposure (Durkin, 2007). However with the measures prescribed as mitigation, the potential for impacts to aquatic fauna will be minimized. For non-target terrestrial plants, the primary hazard is unintended direct spray or spray drift. Offsite drift typically depends on the droplet size and meteorological conditions. Other offsite exposure scenarios for vegetation include percolation, runoff, sediment transport, and wind erosion.

Table 3.4-~~17~~ 20 contains a list of herbicides, including their potential risks to native vegetation and wildlife, which are proposed for use within the Project area on Forest Service lands. It is important to note that there is an extensive variability related to different types of exposure scenarios and dosages for each herbicide. Furthermore, the effects of certain herbicides can vary exclusively at the species level. Therefore, the information presented in Table 3.4-~~16~~ 20 is intended as a general overview of the possible effects of herbicide use. The application of an herbicide should always be conducted by a licensed herbicide applicator. Full analyses on the effects of these seven listed herbicides on human and ecological health can be found in the Forest Service Risk Assessment Final Reports (http://www.fs.fed.us/foresthealth/pesticide/risk.shtml) and is incorporated by reference.

As the proposed Project traverses a wide variety of vegetation communities and supports several different species of noxious weeds, a variety of herbicides may be selected. For example, at locations where aquatic species occur, an herbicide that does not contain added surfactants would be ~~recommended~~used. Surfactants are materials added to enhance the ability of the herbicide to adhere to the treated surface and have been shown to adversely affect aquatic life, including fish and amphibians (Solomon and Thompson, 2003; Tatum, 2004).

Table 3.4-20. General Effects of Herbicides on Plant and Wildlife Species

Herbicide	Effects on Vegetation	Effects on Wildlife
Chlorsulfuron	• Rate and extent of uptake following foliar application varies by species • Inhibits an enzyme that is essential for plant growth	• Causes weight loss and decreased body weight gain in experimental mammals • Appears to have low toxicity in mammals, birds, fish, and invertebrates
Clopyralid	• Highly selective toxicity to terrestrial plants (primarily broadleaf species) • Relatively non-toxic to aquatic plants and grasses • Regulates plant growth by acting as a synthetic auxin, thus altering plant's metabolism and growth characteristics	• Appears to be relatively non-toxic to terrestrial or aquatic wildlife • May adversely affect liver and kidney weights and gastric epithelial tissue • Appears to show no effect on viability of bird eggs and chick immune systems
Dicamba	• Mimics plant hormone indole-3 acetic acid • Mechanism appears to involve a stimulation of ethylene production leading to accumulation of abscisic acid and/or cyanide resulting in abnormal growth	• Displays an apparent pattern of interspecies scaling, with smaller animals being less sensitive than larger animals • Relatively non-toxic to mammals, fish, and amphibians • Acute toxicity to birds appears to be generally low • May reduce growth and stunt eye development in pre- and post-hatch birds
Glyphosate	• Inhibits shikimic acid pathway, effectively blocking synthesis of certain phenolic compounds and aromatic amino acids • Inhibits photosynthesis, respiration, and nucleic acid synthesis	• May reduce food conversion efficiency leading to loss of body weight in mammals and birds • Certain surfactants used with glyphosate are much more toxic to fish that others • May cause histological changes in gills, kidneys, and liver of some fish
Imazapyr	• Inhibits an enzyme that is essential for plant growth • Practically non-toxic to conifers	• Appears to be relatively non-toxic to terrestrial and aquatic animals
Picloram	• More toxic to broadleaf plants than grasses • Mimics naturally occurring auxins leading to uncontrollable and abnormal growth	• Appears relatively non-toxic to terrestrial animals • Moderately toxic to aquatic animals, particularly some fish • May affect fry survival and growth in some fish
Triclopyr	• Mimics indole auxin plant growth hormones causing uncontrollable growth • At sufficiently high levels of exposure, abnormal growth is so severe that vital functions cannot be maintained and plants die	• May cause developmental effects at levels that cause maternal toxicity in mammals • May have adverse affect on mammalian kidney functions • Higher concentrations may cause mortality or immobility in frog tadpoles • Larger doses may cause a decrease in body length and smaller doses may lead to lethargic behavior in some fish • Relatively non-toxic to birds

Source: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

The use of herbicides in the Project area would comply with regulations set forth by the U.S. Environmental Protection Agency (EPA) and California Department of Pesticide Regulation (CDPR).

Additionally, any herbicide use on NFS lands would be subjected to the review and approval of the appropriate FS personnel. Although overspray may adversely affect some non-target species, the removal of noxious or invasive weeds and the control of existing populations would be considered a beneficial effect. To reduce the effects of herbicides, if used, SCE would implement Mitigation Measure B-3a (Prepare and implement a weed control plan).

Noise Effects of Mitigation Measures B-3a, B-3b, and B-3c

Mitigation Measures B-3a, B-3b, and B-3c are recommended to minimize the spread of noxious weeds, however the use of mechanical weed control treatments in areas near sensitive receptors may result in additional noise impacts. (Please see Noise Section 3.10 for a description of sensitive receptors. The use of the term in this context does not constitute biological resources). Mitigation Measures B-3a through B-3c would contribute to increased construction noise from operation of motorized equipment such as brush cutters or mowers, which may impact noise sensitive receptors in the Project area. Section 3.10 (Noise) includes an analysis of the use of motorized equipment to clear vegetation from Project work areas. As described in Table 3.10-10 (Noise Policy Compliance Table – Construction), although construction noise would be temporary and would be reduced by implementation of APMs NOI-1, NOI-3, and NOI-4, and Mitigation Measures N-1a (Implement Best Management Practices for construction noise) and N-1b (Avoid sensitive receptors during mobile construction equipment use), the level of construction noise would violate several local noise ordinances and standards.

CEQA Significance Conclusion

The spread of existing invasive populations or the establishment of new noxious weed populations in previously native areas as a result of Project activities are considered permanent in nature due to the substantial degradation of native habitats within and surrounding the impact areas; and as such, are considered a significant impact without mitigation. Due to the intense effects of noxious weed establishment and spread within California, and the difficulty in controlling existing infestations or restoring arid habitats, Project-related activities that result in the increase in noxious weed populations would have long-lasting consequences for habitats in the proposed Project area and would constitute a significant impact without implementation of the mitigation measures. However, implementation of Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-2 (Implement RCA Treatment Plan), and Mitigation Measures B-3a through B-3c (Prepare and implement a Weed Control Plan, Remove weed seed sources from construction routes, and Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads) will reduce impacts to less-than-significant levels **(**Class II**)**.

Wildlife

The removal of vegetation from the proposed Project can result in direct and indirect effects to wildlife from the temporary and permanent loss of habitat. In addition, construction activities would result in the displacement and/or potential mortality of resident wildlife species ~~that are poor dispersers such as snakes, lizards, and small mammals~~. Construction may also result in the temporary degradation of the value of habitat in and adjacent to the proposed Project area. Noise, dust, and visual disturbances from increased human activity, helicopter operation, and exhaust fumes from heavy equipment used during construction would temporarily result in reduced habitat quality for wildlife adjacent to the construction zone. This section discusses impacts to wildlife in general, particularly non-special-status species. Impacts to special-status species are described under Criteria BIO2 and BIO3.

Impact B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.

Direct impacts to wildlife associated with construction of the proposed Project ~~w~~could include mortality from trampling or crushing; increased noise levels due to heavy equipment and helicopter use; light impacts from construction during low-light periods; increased vehicular and human presence along existing access roads and riparian areas; displacement due to habitat modifications, including vegetation removal, alterations of existing soil conditions; fugitive dust; and, increased erosion and sediment transport. Indirect effects to wildlife as a result of the proposed Project include the introduction of non-native, invasive plant species, alterations to existing hydrological conditions, and exposure to contaminants.

Direct mortality of small mammals; amphibians and reptiles; eggs and nestlings of bird species with small, well-hidden nests (impacts to nesting birds are discussed under Impact B-5); and other less mobile species would likely occur during construction of the proposed Project. This action would result primarily during habitat clearing, earth removal, grading, digging, and equipment movement. Birds, specifically eggs and nestlings, could be directly impacted by use of helicopters in construction due to startling and increased wind velocity near the nest. More mobile species like birds and larger mammals are expected to disperse into nearby habitat areas during construction.

Increased lighting during low-light periods can cause some species to leave the area and can disrupt foraging, breeding, or other activities. Many insects are drawn to lights, and species that prey on insects, such as bats, may be attracted to lighted construction areas which would increase the potential for disturbance and mortality.

Noise from clearing, grading, and helicopter use would generate the greatest construction impacts on wildlife, especially in undisturbed portions of the ANF. Construction ~~w~~could affect wildlife in adjacent habitats by interfering with breeding or foraging activities and movement patterns, causing animals to temporarily avoid areas adjacent to the construction zone. This could disrupt foraging, breeding, sheltering, and other activities. Nocturnal (i.e., active at night) wildlife would be affected less by construction than diurnal (i.e., active during the day) species since construction would occur primarily during daylight hours. However, construction may also occur during dusk, dawn, or nighttime, and if this occurs, impacts to nocturnal species would be similar to impacts described for diurnal species. More mobile species like birds and larger mammals are expected to disperse into adjacent habitat areas during the land clearing and grading phases associated with tower construction and road construction and widening. Depending on the timing and location of Project activities, construction may also result in temporary disruption along terrestrial and riparian wildlife movement corridors crossed by the Project (see Criterion BIO5 for a full discussion of wildlife movement corridors). Disturbance due to helicopter noise and rotor wash would occur in discrete areas, and wildlife would likely temporarily move away from locations where helicopters would be used. However, displacement of individuals could result in loss of fitness and survivorship if animals are displaced into lower-quality habitat or their breeding or foraging activities are disrupted by the need to move into adjacent areas.

Vehicle and equipment travel on existing access roads may also disturb wildlife. Access to the tower locations varies greatly depending on the Project segment. Most of the Northern and Southern segments have clearly defined access roads that run adjacent to the existing tower locations. In many instances vehicle access would be accomplished by traveling on roads within the existing transmission line corridor. In addition, the relatively flat or gently sloping topography in these segments facilitate access, staging,

and construction near each tower footing. ~~In these areas vehicle disturbance would be limited to a narrow swath of habitat immediately adjacent to the existing structures.~~ Vehicles could cause direct mortality or injury to wildlife that are unable to move out of the way of vehicle traffic. In addition, vehicle traffic could cause displacement of wildlife species, which could interfere with breeding, foraging, sheltering, and other activities.

On the ANF the topography consists of sharply rising slopes, deep canyons, and mountainous terrain. Vehicle access to many of the towers is restricted by the terrain and may not be possible in some locations. These areas would likely require the use of helicopter construction techniques. Similarly, the terrain limits the use of access roads that run adjacent to the existing transmission line corridor. However, existing forest roads would be used to access many of the towers; and it is likely that these roads were utilized during the construction of the original transmission line. These roads also support fire personnel, forest staff, and to a limited extent, permitted recreationists. Some of the roads are gated and typically consist of graded dirt tracks approximately 12 feet in width. Depending on the location of the roads these paths cross numerous small drainages, creeks, dense woodlands, chaparral communities, and scree-covered slopes. While some of these roads occur in close proximity to the existing line, vehicle and equipment travel would occur in habitat areas that are important to many species of wildlife. For example, the perennial flow and thick riparian canopy at the West Fork of the San Gabriel River support habitat for several special-status species. Populations of Santa Ana sucker, speckled dace, and arroyo chub are known to occur in the West Fork of the San Gabriel River. Southwestern pond turtle, coast range newt, two-striped garter snakes, and many raptors and song birds also occur here. While the river would not be directly affected by Project construction activities, access to the Project would occur along a paved section of road that parallels the West Fork of the San Gabriel River from Highway 39 to the dam at Cogswell Reservoir (West Fork Cogswell Road). This road is located immediately adjacent to the river for seven miles and is consistently within the riparian canopy. Numerous small ephemeral and intermittent drainages are also present in the canyon and provide tributary flow into the river along this section of the San Gabriel River. In some areas these drainages cross the access road as Arizona crossings or small culverts. Vehicle access through these areas when supporting flowing water could result in mortality to Santa Ana suckers and other special status species if present. In addition, the many small drainages and creeks that are crossed provide important riparian habitat and water sources for wildlife. On the ANF, many of these areas qualify as RCAs and some may require specific management authorization prior to any action. The number of various types of road crossings within RCAs on the ANF for the Proposed Project are identified in Table 3.4-19. A map of the RCA crossing points on the ANF is included as Figure 3.4-6, located in the Map & Figures Series Volume.

The structure of the vegetation communities associated with riparian habitats provides cover and nesting habitat for songbirds and smaller birds of prey. These areas also serve important functions for wildlife movement and dispersal. The linear configuration of riparian areas creates corridors for local animal movement including travel to and from different habitat types. While riparian habitat occurs as linear strips through various vegetation types, the adjacent upland habitat is often different. The edges where riparian habitat meets with upland habitat are known as ecotones, or transitional habitats. Numerous studies have shown that transitional habitats are critical for many animal species. The variety in vegetative structure and species composition associated with riparian areas is critical for breeding birds, small mammals, reptiles, and amphibian species which have a terrestrial stage in their life history. Vehicle traffic would disrupt wildlife usage in these areas.

Human disturbance near riparian areas could also limit access to critical water features in select portions of the ANF. Terrestrial wildlife species rely upon these areas for year-round water supply, particularly during the hot and dry summer season. Aquatic habitats in the ANF may also include ephemeral pools or seeps. Such ephemeral pools provide critical breeding habitat for amphibians such as salamanders, frogs, and toads. These ephemeral sources of water generally remain only a few months and only occur during years when sufficient precipitation occurs. Such water sources allow wildlife to disperse during the breeding season without making it necessary to travel long distances to water.

Access and Spur Roads

Many of the existing access roads, spur roads, and road crossings, particularly on NFS lands, do not currently meet the 16 foot minimum width that SCE has indicated would be required for the passage of heavy equipment during construction of the proposed Project. On the ANF, conditions along access roads can change within very small timeframes due to loose soils, landslides, washouts, and fallen trees. As a result of current access road conditions and the ability for these conditions to rapidly change, the majority of these roads would require upgrades, including, but not limited to, cutting and filling, clearing, grading, and soil compaction. Many of these activities would continue to be performed as part of ongoing maintenance during construction of the proposed Project to keep the roads passable to construction equipment and vehicles. Vegetation communities and wildlife habitats also vary dramatically along the access roads in the Project area. These range from agricultural and arid desert scrub communities at lower elevations in the Northern Region to riparian woodlands, oak woodlands, and various scrub communities on the ANF within the Central Region. Dense stands of Douglas fir and other coniferous forests also occur at higher elevations within the Central portion of the proposed Project area. Additionally, scree-covered hillsides, exposed bedrock, disturbed road edges, and semi-disturbed fields of annual wildflowers are interspersed between large continuous blocks of high-quality habitat. In order to facilitate construction of the proposed Project, soil, rock, and vegetation would be removed to accommodate the passage of heavy equipment. In many areas, this would include the direct removal of riparian plant species and/or mature oak, pine, and fir trees. As discussed under Impacts B-2 and B-4 above, numerous existing access roads either directly cross or parallel RCAs on the ANF. Widening of access roads to allow construction equipment to pass in some RCAs would require the removal of riparian vegetation and the potential diversion of water flow since there are several seeps that flow across the road during portions of the year. Natural seeps and springs also occur ~~along~~ adjacent to portions of several of these access roads, and could be directly or indirectly affected by road widening and improvement. However, site specific details will need to be determined during final engineering and in some cases may require a streambed alteration agreement. Many of these wet features are capable of supporting amphibian species, including arroyo toad and coast range newt. In some areas, such as Mount Gleason, and Mount Wilson, access roads bisect dense stands of oak trees and various conifers. These areas provide important nesting habitat for a suite of bird species, including California spotted owl. In addition, once disturbance has occurred, it may be extremely difficult to control illegal Off Highway Vehicles (OHV). OHVs could directly impact species such as arroyo toads through road kill. Birds could be flushed from their nests by OHV noise and presence, and OHV users could drive off road and kill plants and/or animals. Larger species such as mule deer may avoid areas of OHV use.

The ecological effects of roads have been widely studied (Trombulak and Frissell, 2000; Findlay and Bourdages, 2000; Jones et al., 2000; Parendes and Jones, 2001; Haskell, 2000; and Vistnes and Nellemann, 2001). Seven general effects of roads have been identified: mortality from road construction, mortality from vehicle collisions, modification of animal behavior, changes to the physical environment,

changes to the chemical environment, spread of invasive species, and increased human access and use (Trombulak and Frissell, 2000).

Road construction results in the injury and mortality of slow–moving and sedentary organisms that are in the path of the road and along its edges. In addition, road construction alters the physical characteristics of the soil underneath the road. For example, road construction increases compaction up to 200 times relative to undisturbed sites (Riley, 1984). Organisms that are not killed directly by the construction of the road can be effectively displaced by the altered soil conditions (Haskell, 2000). Road construction also results in sedimentation to water bodies at road crossings~~,~~ from vehicular crossings, the expansion of the existing access roads, and stream bank erosion. ~~which~~ Sedimentation is detrimental to aquatic organisms as sediment can interrupt gas exchange for amphibian and fish eggs and larvae, and fill in interstitial spaces in gravel beds used by prey items and for oviposition sites for fishes (Trombulak and Frissell, 2000).

Construction traffic along access and spur roads, particularly in areas used by nesting birds or near water sources, can adversely affect wildlife by disrupting breeding, foraging, and movement. Wildlife species are most vulnerable to disturbances during their breeding seasons. These disturbances ~~w~~could result in nest, roost, or territory abandonment and subsequent reproductive failure if these disturbances were to occur during the breeding season. Helicopter noise ~~w~~could also have the potential to disrupt wildlife, alter behavior, and may result in nest or territory abandonment for short periods of time.

The use of access roads by construction/maintenance vehicles ~~w~~could result in accidental road-killed wildlife if these species occurred on roads during construction activities. Diurnal reptiles and small mammals such as western fence lizards, desert cottontails, and California ground squirrels are the most likely to be subject to vehicle-caused mortality, although few if any wildlife species are immune to vehicle collisions. These types of effects are most likely to occur in the more remote portions of the Project area. Vehicle collisions with mule deer and other forest species may also occur, particularly on NFS roads. Where vehicles cross riparian areas, road kill could also include aquatic reptiles and amphibians. Because access roads will be used heavily, albeit for relatively short durations of time during the construction phase, there exists a high likelihood for mortality of wildlife due to vehicle collisions. This type of mortality can have devastating effects on local populations by reducing population size and inhibiting the growth of populations -(Trombulak and Frissell, 2000). Furthermore, animals killed along access and spur roads as a result of this project may attract opportunistic predators which may result in additional accidental mortality.

Amphibians are particularly vulnerable to road kill because they disperse across uplands between water sources, are small and inconspicuous, and are usually slow-moving. One study in Ontario found an inverse relationship between local abundance of frogs and toads and traffic on nearby roads. However, the incidence of road killed amphibians is increased on heavily traveled roads adjacent to suitable habitat. Thus, where roads are frequently traveled, frog and toad population sizes are suppressed but road kill rates are high, further decreasing population sizes (Fahrig et al., 1995).

Animal behavior is altered by the presence of roads in five ways: home range shifts, altered movement patterns, altered reproductive success, altered escape response, and physiological stress (Trombulak and Frissell, 2000). For example, mule deer in Colorado prefer areas more than 200 meters from roads and mountain lion home ranges are located in areas with low densities of dirt roads (Trombulak and Frissell, 2000). However, turkey vultures and black vultures select home ranges with higher road densities, presumably for the increased carrion due to road kills (Trombulak and Frissell, 2000). In the Angeles

National Forest major paved roadways are likely the most important factor in the alteration of wildlife behavior as many of the remotely located dirt roads clearly show strong evidence of wildlife use. This is likely due to the nearly impenetrable stands of chaparral that occur in some areas.

The physical conditions on and adjacent to roads differ from other undisturbed areas. Edge effects occur that last well past the time of construction. Soil compaction alters the microhabitats available for plants and soil fauna. Roads in forested areas increase the amount of light that reaches the forest floor, which can open up habitat for early-successional, disturbance-loving species such as many weeds (Parendes and Jones, 2000).

Dust from vehicle access would also affect species in adjacent habitat. The Angeles National Forest strategy AIR 1 is directed to "Control and reduce fugitive dust to protect human health, improve safety and moderate or eliminate environmental impacts." To this effect the Project would reduce dust emissions on habitat by the use of non-hazardous soil binders and limited vehicle speeds on dirt roadways. Dust can inhibit photosynthesis, smother small organisms, and reduce the quality of the habitat if excessive. Heavy dust generated during the use of dirt roads can also contribute to sedimentation in nearby bodies of water, while road crossings act as barriers to movement for fish and other aquatic wildlife and result in increased turbidity downstream of the crossing.

Roads change the hydrology of slopes and stream channels, which results in changes that are often detrimental to plant communities and wildlife. Roads can intercept shallow groundwater, rerouting surface drainage patterns. This is apparent in places such as along Monte Cristo Creek, where shallow groundwater results in one area where surface water flows along the edge of the existing access road. These kinds of changes to hydrology can result in slope failures and sedimentation through channel downcutting, new gully or channel head initiation, or slumping and debris flows (Trombulak and Frissell, 2000; Jones et al., 2000). SCE would be required to lay steel plates across such areas to limit the amount of sedimentation and turbidity generated by driving through wet areas of the road.

Pollution, including the deposition of heavy metals, organic compounds, and nutrients, also occurs along roads. Contamination of plant tissue has been recorded as far as 200 meters from roads, and contamination is exponentially higher in plants adjacent to road edges (Trombulak and Frissell, 2000). Roads also contribute pollution and nutrients to nearby aquatic ecosystems at a high rate because the normal buffering effect of riparian vegetation is removed along roads that run adjacent to or cross water bodies. Organisms may be killed or displaced due to the presence of contaminants from roads, and native plant growth and survival is negatively impacted by contaminants (Trombulak and Frissell, 2000).

Roads facilitate the spread of invasive species by opening up bare areas of soil that are readily colonized by disturbance-loving exotics. Further, the use of roads increases the deposition of nutrients such as nitrogen that are favored by exotic species. As discussed above, roads also increase the availability of light and water (as runoff) along road edges, and dust and contamination can stress or kill native vegetation adjacent to the road. Finally, roads increase access by human and animal weed propagule vectors. All of these conditions lead to increased recruitment of noxious weeds along road edges (Trombulak and Frissell, 2000).

The presence of roads increases the ability for humans to access remote areas. Increased human access can result in disturbance to wildlife, litter, road kills, and other detrimental effects. While SCE would gate access and spur roads on NFS lands to discourage unauthorized use (Mitigation Measure B-1a, Provide restoration/compensation for impacts to native vegetation communities), some use may occur. This is especially important in areas where new spur roads would be created. Additionally, some access

roads in the Northern and Southern Regions would not be gated and would thus result in increased use by the public.

Local populations of wildlife that occur along the proposed Project ROW are expected to temporarily decline in abundance or disperse during the construction phase of the Project, but common species are expected to return to their pre-construction levels following the restoration of the helicopter landing areas, pulling/splicing sites, concrete batch plant sites, staging areas, and tower erection sites. Also, as construction is limited to relatively small areas, opportunistic wildlife species would likely return to the proposed ROW areas as work crews move to new tower locations.

A large part of the proposed Project route would be constructed along the existing SCE designated utility corridor. Most of the wildlife expected to be impacted by construction in these easements are composed of common, wide-ranging species. Due to the narrow area of disturbance along this Project and the short duration of disturbance, many common wildlife species occurring along the transmission line route are expected to quickly re-colonize the area after construction activities have been completed. However, re-colonization rates will depend on the rate of revegetation at each disturbed site, with slower wildlife re-colonization in vegetation communities that are difficult to restore and slow to recover from disturbance. The use of access roads would also result in the temporary decline of species in the immediate vicinity of the roads, however the effects of traffic are typically short term and vehicle speeds would be limited.

Project-related effects on common species would be minimized through the implementation of mitigation measures designed to educate workers of the presence and sensitivity of wildlife that may occur in the Project area; limitations on the work that may occur in RCAs, reducing the effect of fugitive dust on adjacent areas through dust control and reduced vehicle speeds; the restoration of habitat at the conclusion of construction; and the control of noxious weeds. The implementation of erosion control measures would also reduce the potential off-site transport of sediment to both aquatic and upland habitats. These measures include APM BIO-1 which requires SCE to conduct pre-construction clearance surveys for wildlife and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and Mitigation Measure AQ-1a (Dust Control). The implementation of these measures would reduce fugitive dust, re-establish native vegetation communities following disturbance, educate workers about wildlife, and prevent the spread or colonization of noxious weeds which can severely degrade habitat for common wildlife.

Mitigation Measures for Impact B-4

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a Implement an Erosion Control Plan and demonstrate compliance with water quality permits. (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

Construction-related effects to common wildlife are typically not considered significant under the CEQA. However, the large scale of the construction and multiyear schedule would result in potential significant effects to species on the ANF, without implementation of the mitigation measures. Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan.), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to a less than significant level (Class II). Construction impacts to listed and candidate wildlife species are discussed separately under Rare, Threatened, or Endangered Wildlife (Criterion BIO2) below.

Impact B-5: Construction activities conducted during the breeding season would result in the loss of nesting birds or raptors.

The proposed Project area consists of several vegetation communities that are known to support nesting for many bird species. These vary from Joshua tree woodlands and desert habitats in the Northern Region to oak woodlands, chaparral, riparian scrubs and forests, and montane forests in the Central Region and riparian scrubs, coastal sage scrub, and chaparral habitats in the Southern Region.

Direct impacts to nesting birds or raptors as a result of construction activities for the proposed Project could include the removal or disturbance of vegetation that supports nesting birds, increased noise levels from heavy equipment and helicopter operations, increased human presence, and exposure to fugitive dust. Indirect impacts could include the loss of habitat due to the colonization of noxious weeds and a disruption of breeding or foraging activity due to facilitated use of new or improved spur and access roads by the public. Operational impacts include increased human presence from maintenance personnel and collisions with transmission lines (see Impact B-21, below). Operations and maintenance activities would primarily consist of maintenance personnel driving on spur and access roads to check the lines and perform routine grading and road work along with vegetation removal to maintain access along roads. This could disturb nesting birds if conducted during the breeding season. However, road maintenance would be conducted outside of the breeding season, unless otherwise approved, and routine use of the access roads by maintenance personnel would not be likely to interfere substantially with breeding as this use would be of low intensity and relatively infrequent. Once operational, the proposed Project would result in an increase in corona noise, which could impact nesting birds. Impacts related to corona noise are addressed under Impact B-41.

Ground-disturbing activities associated with construction of the proposed Project, including tower pad preparation and construction and grading of new spur roads and grading and widening of existing access roads, would result in the direct removal or disturbance to vegetation utilized by nesting birds. These include nesting songbirds and several raptor species, such as red-tailed hawk and white-tailed kite, which are known or expected to nest in the vicinity of the proposed Project. The removal of habitat during the breeding season would likely result in the displacement of breeding birds and the abandonment of active nests. The proposed Project may also result in impacts to raptors that utilize the existing towers for nesting or burrowing owls that utilize the edges of the agricultural fields, existing roads, and irrigation canals for wintering or breeding habitat. Breeding birds and other wildlife may temporarily or

permanently leave their territories to avoid construction activities, which could lead to reduced reproductive success and increased mortality.

The widening of access roads would result in removal of vegetation that could support nesting birds. Use of access roads by construction equipment and vehicles ~~w~~could disrupt nesting birds and could lead to nest failure or abandonment. The effects of access roads on nesting birds would be similar to that described for general wildlife. See Impact B-4 for a complete description of the effects of the use of roads on wildlife.

Helicopter operations, which would occur in many sections of the ANF, could also adversely impact nesting birds. The use of helicopters for Project construction would increase noise, vibration, dust, and air turbulence, and would cause visual disturbance to nesting birds. These factors could result in the disruption of breeding activity, and subsequent nest failure.

Many species of birds found within the Project area are protected under the Migratory Bird Treaty Act. Nesting birds are also offered protection by the CDFG. All construction and operations/maintenance activities would be performed in compliance with federal and State protections regarding nesting birds, in consultation with the Fish and Wildlife Service and CDFG. To reduce effects of the proposed Project on nesting birds SCE would implement APM BIO-1 and APM BIO-8. These APMs include conducting clearance surveys for wildlife and completing Project-wide raptor surveys. However, as described above these APMs lack specificity and clearly defined monitoring requirements. Therefore, to further reduce effects of the proposed Project on nesting birds SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct pre-construction surveys and monitoring for breeding birds), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-5

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-5 **Conduct pre-construction surveys and monitoring for breeding birds.** SCE shall conduct pre-construction surveys for nesting birds if construction and removal activities are scheduled to occur during the breeding season. Surveys shall be conducted in areas within 500 feet of tower sites, laydown/staging areas, substation sites, and access/spur road locations. Surveys for birds shall be conducted for all areas from February 1 to August 15. The required survey dates may be modified based on local conditions (i.e., high altitude locations) with the approval of the CPUC, California Department of Fish and Game (CDFG), USACE, and/or FS. SCE shall be responsible for designating qualified biologists who can conduct pre-construction surveys and monitoring for breeding birds. The resume of the proposed biologists will be provided to the CPUC, USACE, and FS for concurrence prior to ground disturbance. On NFS lands, the FS shall apply the FS Land Management Plan Standard S18 (Part 3 of the Land Management Plan), which states "Protect known active and inactive raptor nest areas. Extent of protection will be based on proposed management activities, human activities existing at the onset of nesting initiation, species, topography, vegetative cover, and other factors. When appropriate, a no-disturbance buffer around active nest sites will be required from nest-site selection to fledging."

On both NFS and non-NFS lands, ~~I~~if breeding birds with active nests are found, a biological monitor shall establish a 300-foot buffer around the nest for ground-based construction activities and a one-mile buffer for helicopter use if helicopters are flying below 300 feet, and no activities will be allowed within the buffer(s) until the young have fledged from the nest or the nest fails. If nesting bald or golden eagles are identified, a 660-foot no activity buffer will be implemented. The 300-foot (660-foot eagle and one-mile helicopter) buffer may be adjusted to reflect existing conditions including ambient noise, topography, and disturbance with the approval of the U.S. Fish and Wildlife Service (FWS), CPUC, USACE, CDFG, or FS, as appropriate. On NFS lands, the FS shall have the authority to define/redefine such buffers. The biological monitors shall conduct regular monitoring of the nest to determine success/failure and to ensure that Project activities are not conducted within the buffer(s) until the nesting cycle is complete or the nest fails. The biological monitors shall be responsible for documenting the results of the surveys and the ongoing monitoring and will provide a copy of the monitoring reports for impact areas to the respective agencies (e.g., On NFS lands documentation will be provided to the Forest Biologist). If for any reason a bird nest must be removed during the nesting season, SCE shall provide written documentation providing concurrence from the FWS and CDFG authorizing the nest relocation. On NFS lands, this will include coordination and written approval from the FS. On USACE lands, this will include coordination and written approval by the USACE. SCE shall provide a written report documenting the relocation efforts. The report shall include what actions were taken to avoid moving the nest, the location of the nest, what species is being relocated, the number and condition of the eggs taken from the nest, the location of where the eggs are incubated, the survival rate, the location of the nests where the chicks are relocated, and whether the birds were accepted by the adopted parent.

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Implementing ~~T~~the proposed Project, without the mitigation measures, has the potential to violate the Migratory Bird Treaty Act ~~as a result of habitat removal during the breeding season~~by impacting active nests during the breeding season. ~~As described above the displacement of most birds, including raptors or burrowing owls during the breeding season would be a violation of the Migratory Bird Treaty Act and would be considered significant without mitigation.~~ However, ~~I~~implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), and B-5 (Conduct pre-construction surveys and monitoring for breeding birds) would reduce Impact B-5 to less-than-significant levels (Class II).

Impact B-6: The Project would cause the loss of foraging habitat for wildlife.

Direct impacts as a result of construction activities associated with the proposed Project would include the permanent removal and temporary disturbance of rare and non-rare vegetation communities utilized as foraging habitat for both common and rare wildlife, fugitive dust, and increased noise levels due to heavy equipment and helicopter operations occurring in these areas. These impacts would primarily occur during tower pad preparation, grading for helicopter staging areas, and construction, grading, and widening of new spur roads or existing access roads. Indirect impacts to foraging habitat could include alterations to existing topographical and hydrological conditions, increased erosion and sediment transport, and the

establishment of noxious weed colonies. Operational impacts include increased human presence and the spread of noxious weeds due to public use of new or improved spur and access roads.

Construction activities associated with the proposed Project would result in disturbance to a variety of plant communities. Tables 3.4-17 and 3.4-18 present the temporary and permanent impacts to vegetation communities that would occur from implementation of the proposed Project. In total, the proposed Project would permanently disturb a minimum of approximately 48 acres of vegetation identified as rare and worthy of consideration by the CDFG (253 acres of non-rare vegetation) and would temporarily impact a minimum of approximately 221 acres of rare vegetation (818 acres of non-rare vegetation). Additional acreages of land disturbance would occur, but the vegetation communities impacted are unknown at this time as final engineering has not been conducted. ~~In total, the proposed Project would temporarily disturb approximately 231 acres of rare vegetation (1,033 acres of non rare vegetation) and would permanently impact approximately 54 acres of rare vegetation (228 acres of non-rare vegetation).~~ On the ANF, the proposed Project would temporarily disturb a minimum of approximately 19.5 acres of rare vegetation (114 acres of non-rare vegetation) and permanently impact a minimum of approximately 5 acres of rare vegetation (105 acres non-rare vegetation). With the exception of some highly disturbed or developed habitats most of the habitat in the proposed Project area is utilized by both common and rare wildlife for foraging and shelter.

Installation of new tower locations, grading for helicopter staging areas, construction of spur roads, ~~,~~ and widening of access roads would result in the permanent removal of native and non-native vegetation communities including desert scrub, chaparral, coastal sage scrub, a variety of forested woodlands (oak woodland, bigcone Douglas fir, etc.), and non-native grassland. Tables 3.4-17 and 3.4-18 contain a summary of the vegetation that would be subject to Project disturbance. The loss of oak woodlands or scrub oak communities that provide important mast crop could adversely affect the species that rely on those resources. Impacts to foraging habitat would be low compared to the range and acreage of habitat in the Project area, and many species, including raptors and mule deer, typically forage over wide areas. However, impacts to foraging habitat for rodents or invertebrates would be high since they do not range over wide areas. Disturbed areas may also provide access to edge habitats or early successional plant communities which are preferred foraging areas for some wildlife species. In addition, transmission line towers are often utilized by raptors, such as the Swainson's hawk, red-tailed hawk, and peregrine falcon, and they may improve the foraging opportunities for these species by providing roosting or nesting sites.

To reduce impacts of the proposed Project on wildlife habitat SCE would implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), and Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits). The implementation of these measures would facilitate the restoration of native vegetation communities following disturbance, avoid impacts to important riparian areas on NFS lands, minimize the spread or colonization of noxious weeds which can severely degrade habitat for common wildlife, and educate workers to avoid wildlife and their habitat.

Mitigation Measures for Impact B-6

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

Temporary and permanent loss of native vegetation communities that provide foraging habitat for raptor or other wildlife species would be considered a significant impact without mitigation. As described above the implementation of measures that would facilitate the restoration of native vegetation communities, avoid impacts to important riparian areas on NFS lands, and prevent or minimize the spread or colonization of noxious weeds would reduce impacts of the proposed Project. Therefore SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), and Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) to reduce impacts to less-than-significant levels (Class II).

Impacts to Endangered or Threatened Species, or Proposed or Designated Critical Habitat (Criterion BIO2)

Threatened and Endangered Plant Species

Seven State or federally listed or proposed plant species have the potential to occur in the proposed Project area. These include the federally listed Braunton's milk-vetch, Nevin's barberry, slender-horned spineflower, and thread-leaved brodiaea; the California State-listed Mt. Gleason Indian paintbrush; and the federal candidate species Brand's phacelia and San Fernando Valley spineflower (also State-listed endangered). Critical habitat has been designated for ~~two~~ three of these plant species:~~,~~ thread-leaved brodiaea (USFWS, 2005a), ~~and~~ Braunton's milk-vetch (USFWS, 2006), and ~~critical habitat has been designated for~~ Nevin's barberry (USFWS, 2008). However, the proposed Project is not located in ~~designated or proposed~~ critical habitat for any of these species.

Ground-disturbing activity, including tower pad preparation and construction, grading of new access roads, tower removal, and use or improvement of existing access roads has the potential to disturb listed plant species. Impacts to these species are detailed below.

Impact B-7: The Project ~~would~~ could disturb endangered, threatened, or proposed plant species or their habitat.

Focused botanical surveys of the proposed Project alignment, helicopter staging areas, stringing and pulling locations, etc. were conducted in the summer and fall of 2007 and spring and summer of 2008. Due to the annual rainfall received during the 2007-2008 rain year the expression of plant species,

particularly ephemeral annuals that cannot be detected in some years, was considered good to excellent in many portions of the alignment. All accessible impact locations were visited, including new and existing tower locations, spur roads, new substation locations, line pulling locations, staging areas, and along existing and proposed access roads. However, because final engineering has not been completed by SCE some locations including possible pulling sites, tower locations, or helicopter landing sites have not been surveyed. Listed plant species were not observed in or adjacent to the proposed Project area or along any of the proposed access roads.

Direct impacts to listed plant species could occur from construction activities that remove vegetation, grade soils, or cause sedimentation, including tower pad preparation, clearing helicopter staging areas, and the construction, grading, and widening of new spur roads and existing access roads. Indirect impacts could include the disruption of native seed banks through soil alterations, the accumulation of fugitive dust, increased erosion and sediment transport, and the colonization of non-native, invasive plant species. Operational impacts could include trampling or crushing due to public use of new or improved spur roads and access roads, increased erosion, and the spread and colonization of noxious weeds.

Braunton's Milk-vetch

Braunton's milk-vetch is endemic to foothill habitats in the Santa Ana, San Gabriel, and Santa Monica Mountains in Ventura, Los Angeles, and Orange counties (CNDDB, 2007), and is therefore considered to be absent from the Northern Region of the proposed Project. Although the species was not observed during focused floristic surveys of the Project area in 2007 and 2008, the species may occur in areas of suitable carbonate soils in recently burned or disturbed, dry, open chaparral communities (Skinner, 1991) in the Central and Southern Regions of the proposed Project. There are no documented occurrences of Braunton's milk-vetch within the ANF. However, the species is present north of the city of Monrovia in an area to the south of Clamshell Canyon and just south of the ANF boundary (CNDDB, 2007). This area, which lies in the foothills between Segments 7 and 11 of the proposed Project, has been designated critical habitat for this species (Unit 5: Monrovia Unit, FWS, 2006). Another critical habitat unit is located in Coal Canyon (Unit 6, FWS, 2006), about 4 miles from Alternative 4 and 8 miles from Segment 8.

Braunton's milk-vetch is an ephemeral fire-follower that typically persists for only a few years following a fire, and most populations may exist in the soil as a seed bank awaiting the next fire (Skinner 1991). Therefore, a degree of uncertainty will remain regarding the absence of this species following surveys conducted during the blooming period, as the seed bank would not be detected by conventional survey techniques. Portions of Segment 10 were observed to be somewhat recently burned and supported some carbonate soils; portions of Segments 5 and 11 were more recently burned; however, no populations of Braunton's milk-vetch were found to occur in these areas. If encountered during later clearance surveys, any Braunton's milk-vetch individuals or populations encountered will be marked and avoided. Therefore, no adverse effects to Braunton's milk-vetch are expected to occur as a result of the Proposed Project.

Nevin's Barberry

The current distributional extent of Nevin's barberry ranges from the foothills of the San Gabriel Mountains of Los Angeles County to the foothills of the Peninsular Ranges of southwestern Riverside County (USFWS, 2008). The species is therefore considered to be absent from the Northern Region of the proposed Project. Although it was not observed during focused floristic surveys of the Project area in 2007 and 2008, Nevin's barberry may occur in the Central and Southern Regions of the proposed Project on coarse soils in chaparral, cismontane woodland, or coastal scrub habitats, or on gravelly wash margins

in alluvial scrub. Although potentially suitable chaparral habitat is very common in these regions, occupied habitat is widely scattered, and occurrences often consist of very few individuals. Nevin's barberry has been planted in native habitats in several areas, where it has become naturalized. This has resulted in confusion and uncertainty in determining which occurrences are truly native (USFWS, 2008). The largest known occurrence of Nevin's barberry, which contains approximately 200 plants, is in the Vail Lake-Oak Mountain area (USFWS, 2008), many miles from the proposed Project. The CNDDB (2007) lists two extant occurrences of this species within the ANF, in Lopez Canyon and San Francisquito Canyon, over five miles from the proposed Project. However the San Francisquito Canyon population is now believed to have been planted in 1929 following a flood (USFWS, 2008). One individual of Nevin's barberry was observed during 2009 at the Whittier Narrows Nature Center near Segment 7. It is located next to a paved trail and has a numbered post adjacent to it, and is likely of horticultural origin. Threats that have been identified on the ANF include wildfire, fire suppression activities, and illegal trash dumping. Near the southern boundary of the ANF, occurrences in Pasadena and in Big Tujunga wash near the city of San Fernando have been extirpated by development. Overall, the probability that this species occurs within the Project area is low, but because of the proximity of the Project to its historical range, the possibility cannot be ruled out. In addition, this conspicuous plant would likely have been detected during the focused botanical surveys conducted in the spring of 2008. If any individuals or populations are encountered during clearance surveys they will be marked and avoided. Therefore, no adverse effects to Nevin's barberry are expected to occur as a result of Project implementation.

Slender-horned Spineflower

Slender-horned spineflower is known from San Bernardino, Los Angeles, and Riverside counties on sandy beaches and floodplain terraces in alluvial fan scrub vegetation, chaparral, cismontane woodland, and coastal scrub communities (USFWS, 1987). As no suitable habitat is present in the Northern Region of the proposed Project, it is considered absent from this area. In the Central Region, CNDDB (2007) records four historical occurrences within five miles of the proposed Project. Segment 11 bisects one of these populations in the foothills of the city of Altadena in Rubio Wash, but the population is presumed extirpated due to urbanization and modifications for flood control. Other populations, also possibly extirpated, occur three miles east of Segment 11 in La Crescenta and 3.5 miles west of Segment 11 along the West Fork of the San Gabriel River. A population that is presumed extant occurs along Cogswell Reservoir east of Segment 6 (CNDDB 2007), however this area would not be subject to Project activities. This species was not identified during focused floristic surveys conducted in April and May 2008. During construction any individuals or populations encountered during preconstruction surveys will be marked and avoided. Therefore, no adverse effects to slender-horned spineflower are expected to occur as a result of Project implementation.

Mt. Gleason Indian Paintbrush

Mt. Gleason Indian paintbrush is endemic to the San Gabriel Mountains of Los Angeles County where it occurs in rocky places within lower montane coniferous forest and pinyon and juniper woodland communities at elevations of 2,700 to 7,120 feet (CNPS 2007, Consortium of California Herbaria 2007). The species is therefore considered absent from both the Northern and Southern regions of the proposed Project. Mt. Gleason Indian paintbrush has been documented to occur within the ANF at six general locations: Chilao/Horse Flats, Lightning Ridge, Little Rock Creek, Messenger Flats, Mount Gleason, and North Fork Pacoima Canyon. During surveys of all known populations in 1987, a total of at least 3,700 individuals were observed excluding the North Fork Pacoima Canyon site (Mistretta and Brown 1987,

Stephenson and Calcarone 1999). The primary threat to this species on the ANF is its preference for habitat that is also popular for human activities (i.e., gentle slopes and an open understory). Five populations are located within five miles of the proposed Project. The species therefore may occur within the Project area~~, but was not identified during appropriately timed focused floristic surveys conducted in April and May 2008~~. A population was identified in 2008 adjacent to helicopter staging area #4, which would be used under Alternative 6 but not the proposed Project. Any individuals or populations encountered during preconstruction surveys will be marked and avoided. Therefore, no adverse effects to Mt. Gleason Indian paintbrush are expected to occur as a result of Project implementation.

Brand's Phacelia

Brand's phacelia was historically known from 15 populations in Los Angeles, Riverside, and San Diego counties, and in Baja California where it occurred on sandy substrates in coastal dune and coast scrub communities at elevations below 1,113 feet (CNPS 2007). Currently, the species is known from San Diego, Los Angeles, and Riverside counties (CNPS 2007). Brand's phacelia is considered absent from the Northern and Central regions of the proposed Project, which fall outside of the species known historical distribution. In the Southern Region, there are records of an extirpated occurrence in the San Gabriel River east of El Monte (CNPS 2007, CNDDB 2007), and the species may therefore occur in scrub communities underlain by sandy soils within the proposed Project along Segments 7 and 8 south of the ANF. The species is unlikely to occur along Segment 11 where habitat conditions are marginal. Appropriately timed focused floristic surveys for Brand's phacelia conducted in April and May 2008 did not detect this species. During construction any individuals or populations encountered during preconstruction surveys will be marked and avoided. Therefore no adverse effects to Brand's phacelia are expected to occur as a result of the Proposed Project.

San Fernando Valley Spineflower

The federal candidate and State endangered San Fernando Valley spineflower once occurred on sandy soils in coastal scrub communities in Los Angeles, Ventura, and Orange counties. Until its rediscovery in 1999, it had not been seen since 1929 and was considered extinct. It is now known to occur in just two areas: the vicinity of Newhall Ranch and the former Ahmanson Ranch in southeastern Ventura County (CNDDB, 2007). Although there are records of this species five miles to the east of Segment 5 in the vicinity of Elizabeth Lake, recent surveys of suitable habitat in the area have failed to detect the species, and the population has likely been extirpated (CNDDB, 2007). It is considered unlikely to occur in the Northern Region of the proposed Project because only marginal habitat is present. There are no known populations of San Fernando Valley spineflower within the ANF (Stephenson and Calcarone, 1999), and the species is unlikely to occur in the Project's Central Region. There are no identified threats to this species on NFS lands. In the Southern Region, the nearest record of San Fernando Valley spineflower is an extirpated population located approximately 11 miles south of Segment 8 (CNDDB, 2007). The species is therefore unlikely to occur in the Southern Region. In addition, appropriately timed focused floristic surveys conducted in April and May 2008 did not detect this species. Any individuals or populations encountered during preconstruction surveys will be marked and avoided. Therefore, no adverse effects to San Fernando Valley spineflower are expected to occur as a result of the Proposed Project.

Thread-leaved Brodiaea

Thread-leaved brodiaea is known from Los Angeles, Orange, Riverside, San Bernardino, San Diego, and San Luis Obispo counties. It typically occurs in open mesic grasslands in chaparral, cismontane

woodland, or coastal scrub communities and is frequently associated with wet areas or vernal pools. The species is considered absent from the Northern Region of the proposed Project because the region falls outside of the species' distribution, and no suitable habitat is present. In the Central Region, two populations of thread-leaved brodiaea occur just outside of the ANF boundary above the cities of Glendora and San Dimas. This area has been designated as critical habitat for the species (USFWS, 2005a). As part of the focused floristic surveys in 2008, the Glendora population was surveyed in an effort to better understand the microhabitat requirements for the species. Although this critical habitat unit is nearby, thread-leaved brodiaea is considered unlikely to occur in the Central Region due to the lack of suitable mesic grassland habitat and a preponderance of steep, well-drained grassland slopes within the Project area. Some areas exhibiting relatively level or depressional topography and a suite of associated native grassland species were observed within the Chino Hills Alternative alignments, but these areas were not mesic in character. Although very little suitable mesic grassland habitat occurs in the Southern Region of the proposed Project, the potential occurrence of this species in the area cannot be ruled out. However, appropriately timed focused floristic surveys conducted in April and May 2008 did not detect this species. Any individuals or populations encountered during preconstruction surveys will be marked and avoided. Therefore, no adverse effects to thread-leaved brodiaea are expected to occur as a result of Project implementation.

Direct impacts to listed plant species, if found within the Project area, would primarily be related to ground-disturbing activities, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access and/or spur roads. These impacts include trampling or crushing from heavy equipment, vehicles, and foot traffic and alterations to the native seed bank due to soil compaction and modifications to existing hydrological conditions.

Although none of ~~the~~se species described above were encountered during reconnaissance and focused-~~level~~ surveys of the proposed Project conducted in the spring to ~~summer and~~ fall of 2006 and 2007, ~~these surveys were generally conducted outside of the blooming period for these species, and~~ the rainfall totals for 2007 within the proposed Project area were well below average, resulting in conditions that were unfavorable for the detection of many annual or ephemeral plant species. During the spring and summer of 2008 the Project alignment was resurveyed. The 2008 focused floristic surveys did not detect any State or federally listed plant species within the ~~proposed Project~~Alternative 2 alignment. However, there is some possibility that new populations of listed species could potentially establish in areas where they were not previously observed due to dispersal and/or a change in the existing conditions that could favor some listed species, such as a recent burn. Therefore, should Project construction take place after ~~2009~~2010, further focused clearance surveys of all impact areas will be required to determine potential presence of and distribution of listed plant species within the alignment. In addition, any Project areas not surveyed for the proposed Project would require focused rare plant surveys at the correct time of year (blooming season) prior to disturbance. If any of these species are encountered, all individuals or populations within Project impact areas will be marked and avoided.

Indirect impacts to listed plant species can occur from the accumulation of fugitive dust related to Project construction, the introduction and proliferation of non-native invasive plants, and increased soil compaction, erosion, and sedimentation.

Excessive dust can decrease or limit plant survivorship by decreasing photosynthetic output, reducing transpiration, and adversely affecting reproductive success. Soil compaction, erosion, and sedimentation resulting from Project activities can also indirectly impact these species. Grading for new access or spur

roads can alter the surface hydrology in an area and affect plant communities by reducing access to sheet flow during rain events.

Ground-disturbing activities that would occur during the construction of the proposed Project can also result in the proliferation and spread of non-native invasive plants to new areas. Because noxious weeds can permanently degrade rare plant and animal habitats, their proliferation as a result of Project activities could adversely affect listed plant species if they are present. The indirect effects on listed plants due to noxious weeds will be minimized by implementation of Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), which will prevent or reduce the potential spread of noxious weeds, control existing weed populations, and restore native habitats as required by FS Manual 2080 and would therefore further reduce the potential effects on listed plants within the ANF. This measure would also minimize the spread of noxious weeds off of NFS lands.

SCE has indicated that APMs BIO-1 through BIO-7, described in Table 3.4-16, would be implemented as part of the proposed Project to avoid or minimize impacts to biological resources including listed plant species. These APMs include avoiding or compensating for impacts to vegetation communities, training personnel, restricting work to within predetermined limits of construction, implementing Best Management Practices (BMPs), construction monitoring, flagging vegetation for avoidance, and revegetation with appropriate seed mixes. As proposed, the APMs do not provide mitigation ratios, do not specify time for the habitat restoration monitoring, state that only the Regulatory Agencies must be consulted on various issues, and do not specify what elements would be included in a Revegetation Plan. Because the APMs are not considered to be adequate protection for listed plants, the following Mitigation Measures are presented to further reduce impacts of the proposed Project on listed plants: Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants) below.

Mitigation Measures for Impact B-7

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-7 **Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.** SCE shall conduct pre-construction surveys for State and federally listed Threatened and Endangered, Proposed, Petitioned, and Candidate plants in all areas subject to ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access roads. The surveys shall be conducted during the appropriate blooming period(s) by a qualified plant ecologist/biologist according to protocols established by the FWS, CDFG, FS, and California Native Plant Society (CNPS). The resume of the proposed biologists will be provided to the CPUC and FS for concurrence prior to ground disturbance. All listed plant

species found shall be marked and avoided. If a federally listed plant species cannot be avoided on private land, consultation with FWS will occur.

Prior to site grading, any populations of listed plant species identified during the surveys shall be protected by a buffer zone. The buffer zone shall be established around these areas and shall be of sufficient size to eliminate potential disturbance to the plants from human activity and any other potential sources of disturbance including human trampling, erosion, and dust. The size of the buffer depends upon the proposed use of the immediately adjacent lands, and includes consideration of the plant's ecological requirements (e.g., sunlight, moisture, shade tolerance, edaphic physical and chemical characteristics) that are identified by a qualified plant ecologist and/or Forest botanist. At minimum, the buffer shrub species shall be equal to twice the drip line (i.e., two times the distance from the trunk to the canopy edge) in order to protect and preserve the root systems of the plant. The buffer for herbaceous species shall be, at minimum, 50 feet from the perimeter of the population or the individual. A smaller buffer may be established, provided there are adequate measures in place to avoid the take of the species, with the approval of the FWS, CDFG, FS, USACE, and CPUC. If impacts to listed plants are determined to be unavoidable, the FWS shall be consulted for authorization, through the context of a Biological Opinion. Additional mitigation measures to protect or restore listed plant species or their habitat may be required by the FWS before impacts are authorized, whichever is appropriate.

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

H-1a Implement an Erosion Control Plan and demonstrate compliance with water quality permits. (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

Listed plant species were not identified during focused surveys of the proposed Project in the spring and summer of 2007 and 2008. However, listed plant species described above have the potential to occur within the proposed Project where suitable habitat is present, and ground-disturbing Project activities have the potential to disturb these ~~species~~habitats. If present, impacts to these species would be considered significant without mitigation (Class II). However, impacts to special-status plant species would be reduced to a less-than-significant level through implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), and B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants), which will prevent the disturbance of any individuals or populations of these species through Project redesign and avoidance. Take of these federally and/or State-listed species through direct mortality or the loss of occupied habitat would only be authorized in the context of a Biological Opinion issued by the FWS and/or an Incidental Take Authorization from CDFG. As discussed above, indirect effects to these species that could occur due to the proliferation of noxious weeds resulting from ground-disturbing Project activities shall be reduced by the implementation of Mitigation Measure B-3a (Prepare and implement a Weed Control Plan). Indirect effects caused by erosion would be reduced through the implementation of Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits). A Worker Environmental Awareness Program would be provided through the implementation of Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program) to educate workers as to the sensitivity and potential for rare plants to occur.

Threatened and Endangered Wildlife

Habitat in the proposed Project area has the potential to support a variety of State and federally listed wildlife species. Twelve State or federally listed species or species proposed for listing were identified with the potential to occur in the proposed Project area. These include:

- California red-legged frog
- Mountain yellow-legged frog
- Arroyo toad
- Desert tortoise
- Santa Ana sucker
- Unarmored threespine stickleback
- California condor
- Southwestern willow flycatcher
- Least Bell's vireo
- Yellow-billed cuckoo
- Coastal California gnatcatcher
- Swainson's hawk
- Mohave ground squirrel

Ground-disturbing activity, including tower pad preparation and construction, grading of new access roads, tower removal, and use or improvement of existing access roads has the potential to disturb listed wildlife species. In addition, helicopter construction would generate noise, vibration, dust, and air turbulence. Impacts to these special-status species are detailed below.

Threatened and Endangered Amphibians

Several rare amphibian species have the potential to occur in the vicinity of the proposed Project. This includes portions of the Northern and Central sections of the proposed ROW. In addition, species like the mountain yellow-legged frog and California red-legged frog historically occurred in many of the streams and creeks within NFS lands of the Central region but occur now in isolated populations well away from the proposed Project. However, many of the streams, rivers, and tributary drainages that occur on NFS lands have not been extensively or recently surveyed for many species (Sandburg, 2008). In addition, even periodic surveys may fail to detect small or isolated populations of highly cryptic or weather dependent species. Therefore, the use of the existing literature alone may underestimate the potential for some species to occur and there is the potential for undiscovered or remnant populations of listed wildlife to be present in remote locations adjacent to the proposed Project.

The presence of and potential for amphibians to occur in the proposed Project area is linked to the physical characteristics of the landscape. Amphibians often require a source of standing or flowing water to complete their life cycle. However, some more terrestrial species including arroyo toads are linked to aquatic resources for a very limited time during the breeding season and may spend significant times away from the creek channel. Other species can survive in drier areas by remaining in moist environments found beneath leaf litter and fallen logs, or by burrowing into the soil. These xeric-adapted species conserve moisture by emerging only under conditions of high humidity or when the weather is cool and/or wet. Depending on the location of the towers, the Project area provides suitable habitat for amphibians in numerous locations (see Section 3.4.2.3).

Further, the extensive use of access roads that cross ephemeral, intermittent, and perennial drainages including Mill Creek, Monte Cristo Creek, Fall Creek, Big Tujunga, Alder Creek, and the San Gabriel River could result in both disturbance and mortality to wildlife if present. Some wet ford crossings could support listed amphibians at or near the crossing. Amphibians located downstream of a wet ford crossing could be subject to sedimentation and increased turbidity generated by the use of the crossing by multiple construction vehicles. Data from the hydrologic and sediment transport analysis (Please see Section 3.8, Hydrology) conducted for this Project indicate that even under the most extreme erosion caused by the Project the downstream contribution of sediments to areas supporting this species would be negligible.

That is, the total maximum annual sedimentation in tons/acre would contribute approximately 3.4 percent above baseline tonnage over any given storm event at Aliso Canyon and the Santa Clarita River and 1.7 percent at Kentucky Springs and the Santa Clara River. This total is well within the natural variation that occurs within any given storm event and would not result in a large contribution of sediment or result in levels of turbidity above natural storm events. However, because these analyses were based on annual rainfall data, they cannot account for unpredictable storm events and therefore the potential for sediments to affect aquatic species must still be disclosed. Chemical spills from fuel, transmission fluid, lubricating oil, and motor oil leaks could also contaminate water and result in mortality or reduced reproductive success of aquatic organisms. Clearing and grading or the deposition of spoils from excavation located on steep hillsides or on erosion prone soils may also result in the transportation of sediment loads to adjacent creeks. Impacts associated with the use of wet ford crossings are discussed below under impacts to individual species. The effects of access roads on listed amphibians would be similar to that described for general wildlife. Please see Impact B-4 for a complete description of the effects of the use of roads on wildlife.

Sedimentation can have detrimental effects on aquatic wildlife, as detailed in the following impacts. As described in Section 3.8 (Hydrology and Water Quality), the predicted annual average increase in erosion and sedimentation as a result of construction activities on the ANF associated with both the proposed Project and alternatives was analyzed using GIS-based erosion and sedimentation modeling. The results of that modeling are presented in the Hydrology and Water Quality Specialist Report (Aspen and H.T. Harvey & Associates, 2009). As indicated in the report, the implementation of BMPs during Project construction activities would reduce sediment transport and delivery in the Study Area (ANF).

The natural variation in sediment delivery to streams in the Study Area is greater than the modeled sedimentation increases that would result from Project activities. For example, most precipitation in the Study Area occurs during a four-month period in response to winter storms and periodic summer monsoon events, with storm events that generally tend to be both large and intense. During most of the year, little to no sediment is delivered to waterways in the Study Area. But during a large storm event, a large amount of sediment may be transported and delivered directly into aquatic habitat. This variation is completely independent of human activity and is part of the natural variation within the Study Area. Therefore, the increase in annual average sediment delivery (approximately 1.8 percent for Alternative 2) would not be considered large, in comparison with the magnitude of natural variation of sediment transport and delivery that presently occurs in the Study Area.

Impact B-8: The Project ~~would~~ could result in the loss of California red-legged frogs and mountain yellow-legged frogs.

Although not detected in the proposed Project area, direct impacts to the California red-legged frog and mountain yellow-legged frog, if present, could occur from construction activities as a result of mechanical crushing, loss of breeding or basking sites, fugitive dust, and human trampling. Disturbance would be associated with the removal of vegetation and alterations of existing topographical and hydrological conditions, particularly along or downstream of drainage crossings and within RCAs. Indirect impacts to these species could include the degradation of water quality, changes in water runoff due to spur road and access road construction or upgrades, increased erosion and sediment transport, and the spread of noxious weeds along riparian areas. Operational impacts include increased risk of mortality on access or spur roads through collision with vehicles and disturbance from increased public access along new or improved access and spur roads. Another operational impact could result from corona noise, which could potentially

interfere with breeding and predator detection. Impacts associated with corona noise are discussed under Impact B-41.

The California red-legged frog is known to occur in San Francisquito Creek, Aliso Creek (0.8 miles from Segment 11), and in a stockpond adjacent to Amargosa Creek in the Leona Valley and has the potential to occur within the proposed Project at the Amargosa Creek crossing within the Northern Region (Table 3.4-7) and in the Central Region where Segment 11 crosses Aliso Canyon. California red-legged frogs were not observed at Amargosa Creek on any site visit or focused survey between 13 and 15 June 2006, or on 29 September 2007 when the stream was dry. Reconnaissance surveys conducted by SCE on December 19, 2007 and focused surveys conducted in 2008 also did not detect the species. It is unlikely that reaches of the drainage near the Amargosa proposed crossing are occupied by red-legged frogs on a permanent basis. However, the location of the source population for the stockpond is unknown but is likely a permanent water source such as the creek, therefore red-legged frogs may utilize this area as a movement/dispersal corridor at various times, especially during late winter and spring. Likewise, because of the close proximity to the newly discovered red-legged frog population in Aliso Canyon, it is possible that this species may utilize the area of Aliso Creek where Segment 11 crosses, however this population was discovered in September 2009 and focused surveys have not yet been conducted at this crossing.

While California red-legged frogs are presumed absent from the Southern Region, ~~and~~ they are ~~unlikely to occur~~now known to be present within the Central Region, and ~~suitable~~ potential habitat is present at the following additional drainages within the Central Region: Lynx Gulch, Alder Creek, Fall Creek, Big Tujunga Creek (Segment 6/11), and the West Fork San Gabriel River (Table 3.4-7). The threats that have been identified on FS lands include predation by non-native fish and amphibians and crushing of frogs and egg masses by human trampling and vehicles.

In addition, with the exception of the drainages associated with the proposed Project, many of the streams, rivers, and tributary drainages that occur on NFS lands have not been extensively or recently surveyed for many species (Sandburg, 2008), and in light of the new population being found it is reasonable to assume other undiscovered populations likely exist in the region. The proposed Project occurs approximately nine miles east of the LOS-1 Unit (San Francisquito Creek) and approximately 25 miles east of the VEN-3 Unit (Piru Creek) of the revised proposed critical habitat for this species (USFWS, 2006b), therefore no impacts to critical habitat for this species are expected. Although this species was not identified during reconnaissance surveys of the area, populations of California red-legged frogs have been documented in Aliso Creek about 0.8 miles downstream of the alignment, and at ~~both up- and downstream sections of~~ Amargosa Creek about two miles downstream from the alignment, and additional suitable habitat is available along these creeks. Therefore there is a ~~high~~ potential for this species to occur in or adjacent to the proposed Project ROW at ~~that~~ these locations. Depending on the ~~season and presence of frogs~~existing habitat, topography, and moisture availability;~~,~~ construction activities occurring ~~within one mile of~~near Aliso Creek, Amargosa Creek, Lynx Gulch, Alder Creek, Big Tujunga Creek (Segment 6/11), and West Fork San Gabriel River or wet ford vehicular crossings of those drainages, may also have the potential to result in mortality to this species if present.

While this species is typically highly aquatic, California red-legged frogs have been documented to make overland movements of several hundred meters and up to one mile during a winter-spring wet season in Northern California (Bulger et al., 2003; Fellers and Kleeman, 2007) and 2800 m on the central coast (Rathbun and Schneider, 2001). Frogs traveling along water courses exceeded these distances. This is particularly true on nights with high humidity or precipitation. Night-time ~~C~~construction activity

associated with vehicle access or tower preparation may result in construction-related mortality to this species if present.

As the movements of wildlife species are more intensively studied using radio-tracking devices, there is mounting evidence that many wildlife species do not necessarily restrict their movements to some obvious landscape element, such as a riparian corridor. For example, radio-tracking and tagging studies of newts, California red-legged frogs, and western pond turtles found that long-distance dispersal involved radial or perpendicular linear movements ~~away~~ from ~~a~~ one water source to another with little regard to the orientation of the assumed riparian "movement corridor" (Fellers and Kleeman, 2007; Semlitsch, 1998; Reese and Welsh, 1997). Therefore, adequate setbacks from potential habitat are important to ensure impacts to this and other semi aquatic species are avoided; this is an important component to mitigating impacts of the proposed Project.

The mountain yellow-legged frog is thought to have been extirpated from more than 99 percent of its former range. The~~is~~ closest known record of this species occurs in the upper reaches of ~~Littlerock Creek~~Devil's Canyon approximately ~~five~~ six miles from the closest section of the ROW. This species also occurs at Little Rock Creek, South Fork Big Rock Creek, Vincent Gulch and Bear Gulch, ~~approximately 20 miles~~ to the east. Historically this species occurred throughout the San Gabriel Mountains including Mill Creek, Santa Anita Canyon, Big Tujunga Canyon, Switzer Campground area, and in ~~the~~ several tributaries to ~~the West Fork of~~ the East and West Forks of the San Gabriel River. While suitable habitat for this species occurs in many of the drainages and creeks located on NFS lands, it is not expected to occur in the Project area~~.~~. However, many areas have not been extensively surveyed for this cryptic species (Sandberg, 2008) and in fact a previously unknown population was recently discovered in the San Jacinto Mountains (A. Backlin pers. comm., 2009). Furthermore, mountain yellow-legged frogs have been recorded making overland movements of up to one kilometer in the Sierra Nevada (Pope and Matthews, 2001). Frogs traveling along waterways have exceeded this distance. For example one mountain yellow-legged frog in Little Rock Creek was found to have moved 1400 m downstream from its original location (C. Hitchcock and A. Backlin, pers. comm.). The primary threats that have been identified for this species on NFS lands include ongoing activities such as roads and trails use, recreation facilities, and small-scale mining and prospecting operations. While it is likely that road construction would involve the repair or maintenance of stream crossings, this work would not be conducted during periods of high flow and wet ford crossings of streams that could support this species would be surveyed prior to use. As this species is not expected to occur in the Project area, impacts to mountain yellow-legged frog are not expected to occur. However, during the course of surveys and monitoring for California red-legged frog, if mountain yellow-legged frog or other federally listed amphibians are found, work will cease until SCE receives concurrence from the FS, USACE, and FWS, as explained in Mitigation Measures B-8a and B-8b below.

Construction and/or demolition of overhead transmission line towers would require several types of soil disturbance that could result in the degradation of water quality in the many streams and drainages that occur in the Project area. Excavation and/or grading would be required at all tower sites where new pads or footings would be required, at all tower demolition sites, and at all new and/or expanded substations. Additional clearing of vegetation and/or grading would be required for crane pads, pulling stations, staging areas, and access and spur roads. Disturbance of soil during construction could result in soil erosion and lowered water quality through increased turbidity and accelerated sediment deposition into local streams. In particular, road construction for both temporary and permanent roadways has the potential to cause soil instability resulting in erosion and sedimentation, which could potentially degrade

surrounding water quality. For aquatic species the degradation of water quality through increased sedimentation can smother egg masses and juveniles or result in decreased water oxygen levels. The water quality impact of road construction and improvement is of particular concern in areas that cross stream channel or traverses steep slopes. For example, many portions of Segment 6 and 11 are located on steep gradients above known water sources. It is highly likely that sediment could be transported to these drainages absent the implementation of erosion control measures.

Sediment transport from upslope areas subject to grading and earth movement would not result in a degradation of water quality to areas potentially supporting California red-legged and mountain yellow-legged frogs. However, data from the *GIS-Based Erosion & Sediment Analysis Report* (Appendix A of the Hydrology and Water Quality Specialist Report for the TRTP) indicate that with BMPs approximately 577 tons of sediment per year over baseline would be deposited at Butterfield Canyon and the West Fork San Gabriel River due to road improvements upslope of this area. Under baseline conditions, 45,666 tons of sediment were modeled as being deposited annually at this location. This amounts to an increase of approximately 1.2 percent, which, as described above and in Section 2.3, is within the natural variation of any given rain year and would not be considered a large increase over baseline conditions. Additionally, with BMPs in place, the total maximum annual sedimentation in tons per year would contribute approximately 3.4 percent above baseline tonnage over any given storm event at Aliso Canyon and the Santa Clara River. An important consideration regarding potential effects to this species is the contribution of sediment from other watersheds not considered in the analysis for this project. For example, the total contribution of sediment that would be discharged at Butterfield Canyon as a result of the proposed Project does not take into account the total amount of sediment that the numerous other creeks and tributary drainages with expansive watersheds contribute to the West Fork San Gabriel River watershed during storm events. While not quantified, based on the size of these watersheds compared to the watersheds considered in the analysis for this project, it is likely that the total sediment loads are at least an order of magnitude higher than the contribution from the project.~~(i.e. the West Fork of the San Gabriel River). Data from the hydrologic and sediment transport analysis (Please see Section 3.8 [Hydrology] of the EIR/EIS) conducted for this Project indicate that even under the most extreme erosion caused by the Project the downstream contribution of sediments to areas supporting this species would be negligible. That is, the total maximum annual erosion in tons/acre would contribute approximately 3.2 percent above baseline tonnage over any given storm event. This total is well within the natural variation that occurs within any given storm event and would not result in a large contribution of sediment or result in levels of turbidity above natural storm events. With the implementation of best management practices to control erosion the total sediment load would be further reduced by 30 to 50 percent.~~

Currently SCE does not have a specific APM intended to reduce impacts to listed amphibians in the proposed Project area. Measures proposed by SCE that would reduce this impact include APM BIO-1, APM BIO-2, APM BIO-3, APM BIO-4, APM BIO-5, APM BIO-6, and APM BIO-7. These APMs include conducting clearance surveys for wildlife, minimizing vegetation removal at construction sites, avoiding streambeds to the extent practicable, implementation of best management practices, biological monitoring, personnel training, and coordinating and compensating for impacts to wildlife with the regulatory agencies. However, as described above these APMs lack specificity and clearly defined monitoring requirements, do not clearly address impacts to listed amphibians, and do not provide defined mitigation ratios or avoidance measures to rare species. Therefore to further reduce impacts of the proposed Project to California red-legged frogs SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b

(Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8a (Conduct protocol surveys For California red-legged frogs and implement avoidance measures), and Mitigation Measure B-8b (Conduct biological monitoring).

These measures would avoid or minimize impacts to California red-legged frogs, if present, through the ~~acquisition of mitigation lands to off set vegetation removal that may be utilized by this species~~avoidance or compensation of vegetation communities that may be used by the species; the control of exotic weeds which can alter habitat; limit work in riparian areas; utilize erosion control and storm water BMPs to reduce sediment transport to aquatic areas; limit road access during rain events, ensure vehicles use roadways during daylight hours, and implement a series of avoidance BMPs (Described in Mitigation Measure B-8a and B-8b) that would ensure Project-related effects to this species are minimized. Nonetheless, if present, SCE would be required to cease construction activities that could result in a "take" of this species and obtain concurrence from the FWS that "take" would not occur or be authorized for "take" through the context of a Biological Opinion.

Mitigation Measures for Impact B-8

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-8a **Conduct protocol surveys for California red-legged frogs and implement avoidance measures.** SCE shall conduct Fish and Wildlife Service (FWS)-approved protocol surveys for California red-legged frogs if suitable habitat is present near the proposed construction sites at the Amargosa Creek, Aliso Canyon (Segment 11), Monte Cristo Creek, Alder Creek, Big Tujunga Creek (Segment 6), and West Fork San Gabriel River within the Central Region. If surveys have been conducted to protocol within two years of start of construction and no red-legged frogs were identified, surveys would not need to be repeated prior to start of construction. Surveys will continue at least every two years until construction is complete in the identified potential habitat. The resumes of the proposed biologists will be provided to the CPUC and FS for concurrence prior to conducting the surveys.

- Prior to the onset of construction activities, SCE shall provide the following information to all personnel who will be present ~~on~~ within work areas ~~within~~ or adjacent to the project area ~~the following information~~:
    - A detailed description of the red-legged frog including color photographs;
    - The protection the red-legged frog receives under the Endangered Species Act and possible legal action that may be incurred for violation of the Act;
    - The protective measures being implemented to conserve red-legged frogs and other species during construction activities associated with the Project; and

- A point of contact if red-legged frogs are observed.

- All trash that may attract predators of the red-legged frogs will be removed from work sites or completely secured at the end of each work day. At the Project crossing near the newly discovered population in Aliso Canyon, and anywhere ~~If~~ California red-legged frogs are detected in or adjacent to the Project, the following shall apply:
  - A full-time monitor shall be present at the access road crossing near the newly discovered population of California red-legged frog in Aliso Canyon, while water is present.
  - Between 1 November and 31 March, no work will be authorized within one mile of occupied habitat and no vehicular crossings at wet fords of those channels will be authorized. The one-mile buffer distance may be reduced based on the topography of the site with the approval of the FWS, FS, and CPUC.
  - Between April 1 to 31 October, no work will be authorized within 500 feet of occupied habitat and no vehicular crossings at wet fords of those channels will be authorized.
  - If present, SCE shall monitor all related construction activities and develop and implement a monitoring plan that includes the following measures in consultation with the FWS and FS.
  - Prior to the onset of any construction activities, SCE shall meet on-site with ~~staff from the FWS and~~ the CPUC/FS-approved biologist (authorized biologist). The authorized biologist shall hold a current red-legged frog permit from FWS. SCE shall provide information on the general location of construction activities within habitat of the red-legged frog and the actions taken to reduce impacts to this species. Because red-legged frogs may occur in various locations during different seasons of the year, SCE, ~~FWS,~~ FS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on red-legged frogs.
  - Where construction can occur in habitat where red-legged frogs are widely distributed, work areas will be fenced in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. The authorized biologist will assist in determining the boundaries of the area to be fenced in consultation with the FWS/CDFG/FS/CPUC. All workers will be advised that equipment and vehicles must remain within the fenced work areas.
  - The authorized biologist will direct the installation of the fence and conduct a minimum of three nocturnal surveys to move any red-legged frogs from within the fenced area to suitable habitat outside of the fence. If red-legged frogs are observed on the final survey or during subsequent checks, the authorized biologist will conduct additional nocturnal surveys if he or she determines that they are necessary in concurrence with the FWS/CDFG/FS/CPUC.
  - Fencing to exclude red-legged frogs will be at least 24 inches in height.
  - Construction activities that may occur immediately adjacent to breeding pools or other areas where large numbers of red-legged frogs may congregate will be conducted during times of the year (winter) when individuals have dispersed from these areas or the species is dormant, unless otherwise authorized by

CPUC, FS, and FWS. The authorized biologist will assist SCE in scheduling its work activities accordingly.

- If red-legged frogs are found within an area that has been fenced to exclude red-legged frogs, activities will cease until the authorized biologist moves the red-legged frogs.
- If red-legged frogs are found in a construction area where fencing was deemed unnecessary, work will cease until the authorized biologist moves the red-legged frogs. The authorized biologist in consultation with FWS/CDFG/ FS/CPUC will then determine whether additional surveys or fencing are needed. Work may resume while this determination is being made, if deemed appropriate by the authorized biologist.
- Any red-legged frogs found during clearance surveys or otherwise removed from work areas will be placed in nearby suitable, undisturbed habitat. The authorized biologist will determine the best location for their release, based on the condition of the vegetation, soil, and other habitat features and the proximity to human activities. Clearance surveys shall occur on a daily basis in the work area.
- The authorized biologist will have the authority to stop all activities until appropriate corrective measures have been completed.
- SCE shall restrict work to daylight hours, except during an emergency, in order to avoid nighttime activities when red-legged frogs may be present on the access road. Traffic speed should be maintained at 15 mph or less in the work area.
- A qualified biologist must permanently remove, from within the Project area, any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible and ensure that activities are in compliance with the California Fish and Game Code.
- No stockpiles of materials will occur in areas occupied by California red-legged frogs.
- To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times.
- Any spills of any fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc) in areas that may contain California red-legged or mountain yellow-legged frogs will be reported to the FS, FWS, and CPUC within one hour.

B-8b **Conduct biological monitoring.** SCE shall provide a qualified biologist with demonstrated expertise with the listed wildlife species likely to occur in the Project area. This person(s) shall monitor all construction activities daily within suitable habitat for listed or sensitive wildlife. The resumes of the proposed biologists will be provided to the CPUC, USACE, and FS for concurrence prior to the onset of ground-disturbing activities.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** (See full description under Hydrology, Section 3.8)

H-1b Dry weather construction. (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

To date California red-legged frogs or mountain yellow-legged frogs have not been identified within the proposed Project area. However, suitable habitat occurs for this species at several locations. In addition, California red-legged frogs are known to occur within several miles of Amargosa Creek in the Leona Valley (Segment 5). Construction activities that result in direct mortality or the degradation of habitat utilized by this species would be considered significant, without implementation of the mitigation measures. While SCE will implement APMs BIO-1 through BIO-7 as part of the proposed Project, if present, take of federally and state-listed species as described above would constitute a significant impact and would be authorized only through the context of a Biological Opinion issued from the FWS. However, implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8a (Conduct protocol surveys for California red-legged frogs and implement avoidance measures), and Mitigation Measure B-8b (Conduct biological monitoring) ~~w~~could avoid or mitigate take, including loss of habitat, if present, thereby reducing potential impacts to a less-than-significant level (Class II). Mountain yellow-legged frogs are not expected to occur, but if present, are likely to be detected during surveys and monitoring required under Mitigation Measures B-8a and B-8b.

Impact B-9: The Project would result in the loss of arroyo toads.

The arroyo toad is federally endangered and a California Species of Special Concern. In the proposed Project area the arroyo toad is known to occur within portions of the ANF, in Alder Creek, Littlerock Creek, Mill Creek, Tujunga Creek, and Lynx Gulch, a tributary to Tujunga Creek; and critical habitat for the arroyo toad has recently been re-proposed for about 8 miles of Upper Big Tujunga Creek, 3.7 miles of Mill Creek, and 1.9 miles of Alder Creek (FWS, 2009). This species has also been observed in portions of the Santa Clara River outside the Project area and has the potential to occur at several other drainages within the proposed Project. Of those drainages, construction activities including road grading or culvert repair could result in direct or indirect mortality to this species at the following drainages: Kentucky Wash, Big Tujunga Creek (Segment 6/11), Alder creek, and Monte Cristo Creek. Although Kentucky Wash is dry most of the year and may seem an unlikely breeding location for arroyo toads, the species is known to occur at other drainages that are dry most of the year (e.g., San Onofre Creek [Holland et al., 2001] and Fish Creek). However, FWS protocol surveys were conducted for the arroyo toad at Kentucky Wash in 2008 and Aliso Canyon and Kentucky Wash in 2009 with negative results.

The arroyo toad has also been documented at extremely xeric desert localities such as Pinto Canyon in southwestern Imperial County (Jennings and Hayes 1994), Santiago Creek (a tributary to Littlerock Creek on the ANF), and Castaic Creek; all of which may be dry for extended periods. In addition, arroyo toads are known to utilize upland habitats for foraging and dispersal, including coastal sage scrub and chaparral several hundred meters from water if the appropriate sandy substrate is present (Griffin and Case, 2001; FS Species Accounts, 2005). Dispersal distances away from drainages on typical national forest locations are estimated to be only a few hundred meters due to the steeper topography. Ramirez (2002) had only

two occurrences where toads exceeded a lateral movement of over 0.1 mile (0.2 kilometer) with most individuals using habitat within 50 meters of the active channel.

In an effort to maintain and stabilize existing populations, each of the southern California National Forests are currently implementing efforts to modify and change management activities to minimize potential effects. Arroyo toad populations are localized and face a variety of threats. Many populations occur immediately below major dams. The manner in which water is released from upstream reservoirs can greatly influence arroyo toad reproductive success. In addition, predatory nonnative species are a significant threat (FS Species Accounts, 2005).

Invasive and nonnative plants are also a problem in some areas. Tamarisk and arundo colonize newly created flood terraces and can form dense masses of vegetation. These dense stands have higher rates of evapotranspiration than native vegetation, thereby decreasing the amount of available surface water. Tamarisk and arundo also stabilize stream terraces, deepening flood channels and resulting in unsuitable habitat for arroyo toads (Stephenson and Calcarone 1999; FS Species Accounts, 2005).

Campgrounds and roads near arroyo toad breeding pools have resulted in toads and their egg masses being inadvertently crushed by vehicle and foot traffic and disturbed by water recreation. There are a number of national forest campgrounds located near arroyo toad breeding habitat—seven on the Los Padres National Forest, four on the Angeles National Forest, and four on the Cleveland National Forest. Seasonal closures and/or restrictions on vehicle access have recently been instituted at some of these campgrounds to reduce impacts (e.g., Beaver, Lion, and Mono Campgrounds on the Los Padres and Joshua Tree Campground on the Angeles). Road crossings in toad habitat are also being evaluated, and several on the Los Padres and Cleveland have been relocated or rebuilt to reduce impacts to breeding pools (Stephenson and Calcarone 1999; FS Species Accounts, 2005).

Factors influencing survival between breeding seasons may include desiccation, starvation, depredation by native and introduced species, and activities that disturb non-breeding habitats (Sweet, 1992). Drought, especially when combined with water diversions from streams, can lead to a scarcity or early drying of breeding pools and restrict foraging during the period essential for rapid growth. Drought and water diversions also cause the loss of damp subsurface soil, which may result in high adult mortality (Sweet, 1992). The extended five-year drought in southern California during the late 1980s has been closely tied to extremely low reproductive success and subsequent population declines of arroyo toads during this period (Sweet, 1992). During the 2006-2007 rain year, one of the driest years on record in southern California, reproduction of this species was also reduced. Protocol surveys conducted by Aspen at Littlerock Creek and Castaic Creek on the ANF detected little evidence of large-scale breeding and few metamorph toads were identified later in the season.

This species was detected by SCE biologists during surveys conducted on May 29, 2007 at Alder Creek. In addition, reconnaissance-level surveys for the species conducted at each of the five major drainages between 25 and 29 September 2007 did not detect the species. However, surveys conducted by SCE in 2008 detected this species at Lynx Gulch and Forest biologists located a crushed toad on the Lynx Gulch access road the same month (road 4N18 near Segment 6. Figure 3.4-5, located in the Map & Figures Series Volume). This illustrates the cryptic nature of this species and emphasizes the requirement for multiple surveys in areas where potential for this species occurs.

Direct impacts to arroyo toad could occur as a result of crushing from mechanized equipment, temporary disruption of foraging or thermoregulation sites in adjacent upland areas, fugitive dust, or the disruption of egg masses from impacts to water quality. Arroyo toads spend the majority of their life cycles well

away from aquatic ~~habitat~~habitat, that is, post breeding this species occupies streamside terraces and adjacent uplands and impacts to adjacent vegetation can have deleterious effects on this species (Cadre Environmental, 2002).

~~Breeding behavior could also be disrupted due to construction noise, corona noise, and the timing of construction activities. Disturbance to the area would be associated with the temporary removal of vegetation for the construction of tower footings or pulling sites, stream crossings (see Impact B-4 for a full discussion of the impacts associated with the use of access roads), or road grading. Similar to the California red-legged frog, construction activities conducted on steep drainages can also result in sediment transport to areas occupied by this species.~~

Construction activity may result in the incidental take of individual toads, egg masses, and larvae depending on the construction season. Because this species is largely nocturnal, impacts from vehicle use at dawn, dusk, and during the evening would be of concern because this species is known to traverse roads between riparian and upland habitats, especially during rain events. Large numbers of toads, both adults and juveniles, can be active at night during the spring and early summer under otherwise dry conditions. During these activities, toads may move onto and across roads, where they are subject to road kill by passing vehicles. Under the proposed Project approximately 5.8 miles of dirt roadways occur within occupied or potentially occupied habitat. These roads would be subject to some form of road grading either to widen the road to support heavy equipment or to allow all weather access. Although SCE has indicated that construction activities would be limited to daylight hours and the FS will restrict the use of access roads during rain events, toads are known to burrow into the friable soils that occur along road edges and may be subject to mortality by even minimal traffic. As described above, a crushed toad was discovered by FS biologists on Lynx Gulch road. Currently SCE has indicated this road would be utilized during construction of the proposed Project.

Use of the helicopter staging areas may also result in adverse effects to arroyo toads, if present. Currently staging area SCE 6 occurs near habitat occupied by the arroyo toad. This site is located near Big Tujunga River east of Alder Creek. Helicopter site SCE 2 is located adjacent to the Aliso drainage and helicopter site SCE 5 occurs west of Mill Creek. Use of these sites would require clearance prior to use.

Direct effects to juvenile toads may also occur. In many cases, recruitment of metamorphic arroyo toads may occur in only a small section of the stream, even if breeding activity has been more widely distributed. Observations on the Los Padres National Forest (Sweet, 1992) and on other sites in Orange and San Diego Counties indicate that even brief human activities are likely to result in substantial mortality of metamorphic toads. This is usually not a deliberate act; the cryptic nature, very small size (<20 mm or 0.8 in) and immobility (when on the surface) of metamorphic toads foster accidental trampling.

Indirect effects to this species, if present, may be caused by the diversion or modification of water flows, increased downstream sediment transport, or the establishment of noxious weeds. Human activities can indirectly affect arroyo toads by increased noise or by attracting predators such as the common raven, kit fox, and coyote from trash and litter (Boarman, 2002). Increased noise levels can interfere with breeding and mask the approach of predators. It is unknown if ~~C~~corona noise from the new lines would have any~~could also~~ ~~affect~~ effect on breeding by interfering with the high pitched call arroyo toads depend on to attract females. A detailed discussion of corona noise is included under Impact B-41 below.

Breeding behavior could also be disrupted due to construction noise and the timing of construction activities. Disturbance to the area would be associated with the temporary removal of vegetation for the

construction of tower footings or pulling sites, stream crossings (see Impact B-4 for a full discussion of the impacts associated with the use of access roads), or road grading. Similar to the California red-legged frog, construction activities conducted on steep drainages can also result in sediment transport to areas occupied by this species.

Indirect impacts could also occur from clearing and grading for new tower locations. The removal of vegetation from these areas could result in erosion and downstream transport of sediment into habitat that occurs downhill from these areas. Data from the hydrologic and sediment transport analysis (Please see Section 3.8 [Hydrology]) indicate that~~-~~, with BMPs, the increase in sediment over baseline would range from 0.3 percent at Alder Creek above Big Tujunga to 4.7 percent at the North fork of Mill Creek.~~the increase in sediment over baseline would range from 0.8 percent at Alder Creek above Big Tujunga to 14.2 percent at the North fork of Mill Creek.~~ These data indicate that even under the most extreme erosion caused by the Project the downstream contribution of sediments to areas supporting this species is well within the natural variation that occurs within any given storm event and would not result in a large contribution of sediment or result in levels of turbidity above natural storm events. ~~With the implementation of best management practices to control erosion the total sediment load would be further reduced by 30 to 50 percent.~~ Nonetheless, sediment transport could be substantial on a local level at stream crossings ~~where~~ if best management practices have not been implemented.

Operational impacts to arroyo toad are similar to many of the construction impacts, and include increased sedimentation and dust due to use of access roads by the public and maintenance personnel and the spread of exotic weeds.

The permanent loss of arroyo toad upland habitat is expected to be minimal as the towers are located well above the creek channel in most cases. However, because of the cryptic nature of this species and the amount of vehicle traffic required to access the proposed tower locations, arroyo toads present in the ANF could be subject to incidental take. No critical habitat for this species would be affected by the proposed Project.

~~Operational impacts to arroyo toad are similar to many of the construction impacts, and include crushing by vehicles or trampling, increased sedimentation and dust due to use of access roads by the public and maintenance personnel, and the spread of exotic weeds.~~

There are no specific APMs that address impacts to this species;~~. As previously described SCE would implement a series of APMs to reduce impacts to wildlife. However~~ therefore, these measures lack the required specificity to ensure that the effects to this species are adequately minimized. Minimization measures will be required that provide for the restoration of habitat, require worker training, and implement avoidance measures to reduce the take of this species. This would include limitations on the use of access roads, avoiding work in occupied habitat during the activity period for this species, and monitoring Project work areas. To reduce the effects of the proposed Project SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), and Mitigation Measure B-8b (Conduct biological monitoring).

Mitigation Measures for Impact B-9

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-8b **Conduct biological monitoring.** (See full description under discussion for Impact B-8)

B-9 **Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas.** In areas known to support arroyo toads (Lynx Gulch, Monte Cristo Creek, and Alder Creek) the following avoidance measures shall be implemented.

- SCE shall avoid ground disturbing activities (i.e. grading, stream crossing upgrades, parking) along access roads within the one mile buffer for arroyo toads during the activity period for arroyo toads (March-November). This date and buffer may be modified based on the existing temperature regime and habitat conditions with ~~ANF~~ FS and FWS approval. An exception to this restriction may occur if the Forest Service determines that increased road maintenance or reconstruction would need to occur based upon dry ravel or debris torrents resulting from the Station Fire of 2009.
- SCE shall limit use of the access roads in this area within the one-mile ~~A~~arroyo toad buffer area to daylight hours only during the activity period for arroyo toads (generally March-November), unless otherwise approved by the ~~ANF~~ FS (on NFS land), FWS, and/or the CPUC (on private land). Use of these roadways during rain events shall not occur during the activity period for arroyo toads. Vehicle speeds shall be limited to 15 MPH and no parking or loitering shall occur along the access roads.
- SCE shall retain a qualified biologist with demonstrated expertise with arroyo toads to monitor all construction activities full time in occupied arroyo toad habitat. The monitor shall inspect the roadway, all Arizona crossings, and work sites throughout the day and log the time and weather conditions in the area. If adult or juvenile arroyo toads are found on the roadway, vehicle access shall be restricted until the animal has moved off the road or is relocated by a permitted arroyo toad biologist in accordance with the ~~FWS-accepted relocation guidelines~~Biological Opinion.

SCE shall conduct Fish and Wildlife Service-approved protocol surveys for arroyo toad at the following locations if suitable habitat is present near the proposed construction sites: Kentucky Wash, Aliso Canyon, and Big Tujunga Creek (Segment 6/11) within two years ~~to~~ of the start of construction. If arroyo toads are detected, further surveys within the area will not be required and the avoidance measures detailed below will be followed. If no arroyo toads are detected, ~~surveys~~ habitat assessments will be ~~repeated~~ conducted every ~~two~~ years until construction is completed. If the habitat assessment determines that suitable habitat exists, protocol surveys shall be conducted.

- Prior to the onset of construction activities, SCE shall provide all personnel who will be present on work areas within or adjacent to the Project area the following information:
  a. A detailed description of the arroyo toad including color photographs;
  b. The protection the arroyo toad receives under the Endangered Species Act and possible legal action that may be incurred for violation of the Act;

c. The protective measures being implemented to conserve the arroyo toad and other species during construction activities associated with the Project; and

d. A point of contact if arroyo toads are observed.

- For all areas in which this species has been documented SCE shall develop and implement a monitoring plan that includes the following measures in consultation with the FWS and Forest Service.
  - SCE shall retain a qualified biologist with demonstrated expertise with arroyo toads to monitor all construction activities in occupied arroyo toad habitat and assist SCE in the implementation of the monitoring program. The resumes of the proposed biologists will be provided to the CPUC and FS for concurrence. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports populations of arroyo toad.
  - All trash that may attract predators of the arroyo toad will be removed from work sites or completely secured at the end of each work day. Prior to the onset of any construction activities, SCE shall meet on-site with staff from the FS and the authorized biologist. SCE shall provide information on the general location of construction activities within habitat of the arroyo toad and the actions taken to reduce impacts to this species. Because arroyo toads may occur in various locations during different seasons of the year, SCE, FS, and authorized biologists will, at this preliminary meeting, determine the seasons when specific construction activities would have the least adverse effect on arroyo toads.
  - Any arroyo toads found during clearance surveys or otherwise removed from work areas will be placed in nearby suitable, undisturbed habitat. The authorized biologist will determine the best location for their release, based on the condition of the vegetation, soil, and other habitat features and the proximity to human activities. Clearance surveys shall occur on a daily basis in the work area.
  - The authorized biologist will have the authority to stop all activities until appropriate corrective measures have been completed.
  - To ensure that diseases are not conveyed between work sites by the authorized biologist or his or her assistants, the fieldwork code of practice developed by the Declining Amphibian Populations Task Force will be followed at all times.
  - SCE shall restrict work to daylight hours, except during an emergency, or unless otherwise authorized by the FS (on NFS land) or the CPUC (on private land) in order to avoid nighttime activities when arroyo toads may be present on the access roads. Traffic speed shall be maintained at 15 mph or less in the work area.
  - A qualified biologist must permanently remove, from within the Project area, any individuals of exotic species, such as bullfrogs, crayfish, and centrarchid fishes, to the maximum extent possible and ensure that activities are in compliance with the California Fish and Game Code.
  - No stockpiles of materials will occur in areas occupied by arroyo toads.
  - Any spills of any fluids that may be hazardous to aquatic fauna (gasoline, hydraulic fluid, motor oil, etc) in areas that may contain arroyo toads will be reported to the FS, FWS, and CPUC within one hour.

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

H-1a Implement an Erosion Control Plan and demonstrate compliance with water quality permits. (See full description under Hydrology, Section 3.8).

H-1b Dry weather construction. (See full description under Hydrology, Section 3.8).

CEQA Significance Conclusion

The arroyo toad is known to occur at Alder Creek, Big Tujunga Creek, and Lynx Gulch and has the potential to occur at several other locations within the ANF. This species is not expected to occur on non-FS lands affected by the proposed Project. Even with the implementation of avoidance and minimization measures described above construction activities associated with the proposed Project are likely to result in the incidental take of arroyo toad from vehicle access across or adjacent to Alder Creek, Lynx Gulch, and/or Tujunga Creek or its tributaries. Because arroyo toads are small and cryptic they are easily subject to mechanical crushing by humans and construction equipment.

Construction activities that result in direct mortality or the degradation of habitat utilized by this species would be considered significant absent mitigation (Class II). SCE would implement APMs BIO-1 through BIO-7 as part of the proposed Project. However, the take of federally and State-listed species as described above would constitute a significant impact and would be authorized only through the context of a Biological Opinion issued from the FWS. Therefore, SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure AQ-1a (Implement dust control measures). SCE shall provide the Biological Opinion from the FWS prior to initiating any activities within suitable habitat for this species.

These measures include, but are not limited to, avoiding the peak breeding period, the placement of exclusion fencing if animals are present, implementation of a capture and release program, and construction monitoring by authorized biologists. Implementation of these measures would avoid or mitigate take, including loss of habitat, thereby reducing potential impacts to a less-than-significant level (Class II).

Threatened and Endangered Reptiles

The desert tortoise is a federal and State threatened species that ranges from the Mojave and Sonoran deserts of southeastern California and southern Nevada, south through Arizona into Mexico. It occurs primarily on flats and bajadas with soils ranging from sand to sandy gravel with scattered shrubs. The desert tortoise requires sufficient suitable plants for forage and cover, and suitable substrates for burrows and nest sites. The desert tortoise is threatened by off-road vehicles, livestock grazing, and mining. Disease related to human-caused stress is also taking a heavy toll on the desert tortoise (Christopher et al., 2003).

~~Although the potential for this species to occur along the proposed Project route is low, there is some~~There is a moderate potential for this species to occur in the northern sections of Segments 4 and 10. No critical habitat or desert tortoise management areas occur in the proposed Project area.

Impact B-10: The Project ~~would~~ could result in the loss of desert tortoises.

Potential habitat for the desert tortoise occurs in Joshua tree woodlands and creosote scrub habitats present in the Northern Segment of the proposed Project. Historically this portion of the Antelope Valley likely supported populations of this species. The desert tortoise is believed to be present in low densities within the northern region of the Project (Segments 4 and 10) based on recent information from the FWS. Two credible sightings west of State Highway 14 were reported to the FWS in 2008-2009. In addition, three desert tortoises and several active burrows were observed within one mile of the TRTP in April and May 2009.~~; however, there are no records for desert tortoise and no sign of their presence was detected during focused surveys of the transmission line corridor. Currently this area is not considered within the range of this species.~~ Focused, non-protocol level surveys conducted in support of this EIR/EIS for desert tortoise were conducted in June 2006 in portions of Segment 10 in the Northern Region where habitat is suitable for desert tortoise and where access had been granted. Reconnaissance-level surveys were also conducted across Segments 4 and 10 in June 2006 and September 2007. Although the habitat within the area surveyed is suitable for desert tortoise, no sign of desert tortoise was detected. While ~~no records for desert tortoise exists within the proposed Project area and~~ no sign of their presence was detected during focused surveys, the potential occurrence of desert tortoise in Joshua tree woodland-creosote bush scrub habitats within the proposed Project cannot be ruled out. Protocol-level surveys were completed by SCE in 2007 and 2008 for the Windhub Substation site, which is located at the northern terminus of Segment 10 and is not part of the proposed Project. In 2007, five potential tortoise burrows were identified, but no sign of recent use was noted. In 2008, SCE biologists reassessed these burrows and found three of the five burrows collapsed due to recent sheep activity. The remaining two burrows were determined at that time not to be tortoise burrows due to the size and shape (LSA, 2007 and 2008). ~~Recent surveys completed by SCE in 2007 for the Windhub substation, which is located at the northern terminus of Segment 10, identified several abandoned burrows but no sign of recent use was noted.~~ If these burrows originally belonged to tortoises they have likely been abandoned for decades. ~~One possible reason for the apparent absence of this species within other portions of the Northern Segments is the historic agricultural and cattle grazing that occurred in the region. These effects result in rapid type changes of habitat and can facilitate the introduction of exotic plants in some community types.~~

Direct impacts associated with construction of the proposed Project could include mortality due to collisions with vehicles or heavy equipment, fugitive dust, crushing of burrows, and increased noise levels. Indirect impacts could include loss of habitat; the introduction of non-native, invasive plant species; and increased human presence.

Construction activities that result in direct mortality or the degradation of habitat utilized by this species, if present, would be considered a "take" of federally and State-listed species as described above and would constitute an impact that would be authorized only through the context of a Biological Opinion issued from the FWS. To reduce impacts to desert tortoise SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-10 (Conduct surveys for desert tortoises and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). These measures include pre-construction clearance surveys, restoring areas subject to

Project disturbance, controlling the spread or colonization of noxious weeds, relocation of animals from the work area, and construction monitoring by authorized biologists. Implementation of these measures would avoid or mitigate effects to this species.

Mitigation Measures for Impact B-10

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-10 **Conduct presence or absence surveys for desert tortoise, preserve habitat, and implement avoidance measures.** SCE shall contract with a Fish and Wildlife (FWS)-authorized biologist to conduct FWS protocol-surveys for desert tortoise in the vicinity of the proposed Windhub Substation site at the northern terminus of Segment 10, where historic tortoise burrows were documented and habitat is suitable. The resumes of the FWS-authorized biologists will be provided to the CPUC for concurrence prior to conducting the surveys. This biologist will be referred to as the "authorized biologist" hereafter. Additionally, a qualified biologist shall conduct focused clearance surveys for desert tortoise prior to construction activities within Segment 10 and Segment 4 between the Cottonwind and Whirlwind substations.~~areas of the Project north of Vincent Substation that are designated in the West Mojave Plan (WMP) as desert tortoise "Survey Areas."~~ Clearance surveys shall be conducted 100 m into agricultural areas that are adjacent to suitable habitat~~Clearance surveys are not required in developed or agricultural areas~~. Clearance surveys shall follow the FWS's desert tortoise survey protocol~~, as modified within the WMP (BLM 2005)~~.

To mitigate potential permanent impacts to occupied desert tortoise habitat from Project construction, SCE will acquire habitat occupied by desert tortoises. Disturbance occurring along Segment 10 and along Segment 4 between the Cottonwind and Whirlwind substations shall be mitigated through acquisition of occupied habitat at a ratio of 3:1 (acres of habitat acquired:acres of land permanently disturbed). Mitigation acquisition shall occur at a FWS- and CDFG-approved location and shall be coordinated through a FWS- and CDFG-approved entity. SCE shall enter into a binding legal agreement regarding the preservation of off-site lands describing the terms of the acquisition, enhancement, and management of those lands. Fee title acquisition of habitat lands or a conservation easement over these lands will be transferred to an entity approved by FWS and CDFG, along with funding for enhancement of the land and an endowment for permanent management of the lands. SCE will provide verification to the CPUC that FWS- and CDFG-approved lands have been acquired.

~~If tortoises or intact active burrows are found in the impact area or if the authorized biologist determines that a tortoise may enter the construction site,~~ SCE shall ~~halt work within 500 feet of the tortoise or burrow and~~ develop and implement a mitigation and monitoring plan that includes the following measures in consultation with the FWS and CDFG. ~~Construction activities may not resume within 500 feet of a tortoise or in tortoise habitat without concurrence from the FWS and CDFG.~~

- Prior to the onset of construction activities, SCE shall provide all personnel who will be present on work areas within or adjacent to the Project area the following information:
    a. A detailed description of the desert tortoise including color photographs;

b. The protection the desert tortoise receives under the Endangered Species Act and possible legal action that may be incurred for violation of the Act;

c. The protective measures being implemented to conserve the desert tortoise and other species during construction activities associated with the Project; and

d. A point of contact if desert tortoises are observed.

- All trash that may attract predators of desert tortoises will be removed from work sites or completely secured at the end of each work day.
- In construction areas in occupied desert tortoise areas, work and staging areas will be fenced with approved desert tortoise fencing in a manner that prevents equipment and vehicles from straying from the designated work area into adjacent habitat. The authorized biologist will assist in determining the boundaries of the area to be fenced in consultation with the FWS/CDFG/CPUC. All workers will be advised that equipment and vehicles must remain within the fenced work areas. Installation of the fencing and any necessary surveys will be directed and/or conducted by the authorized biologist in concurrence with the FWS/CDFG/CPUC.
  - If desert tortoises are found within an area that has been fenced to exclude the species, activities will cease until the authorized biologist moves the desert tortoises within 500 m of their original location.
  - If desert tortoises are found in a construction area where fencing was deemed unnecessary, work will cease until the authorized biologist moves the individual(s) within 500 m of their original location. The authorized biologist in consultation with FWS/CDFG/CPUC will then determine whether additional surveys or fencing are needed. Work may resume while this determination is being made, if deemed appropriate by the authorized biologist.
  - Any desert tortoises found during clearance surveys or otherwise removed from work areas will be placed in nearby suitable, undisturbed habitat within 500 m of their original location. The authorized biologist will determine the best location for their release, based on the condition of the vegetation, soil, and other habitat features and the proximity to human activities. Clearance surveys shall occur on a daily basis in the work area if the area is not fenced. If the area is fenced, only monitoring will need to be conducted.
  - SCE shall follow the tortoise Handling Guidelines at all times if handling tortoises is required.
  - The authorized biologist will have the authority to stop all activities until appropriate corrective measures have been completed.
  - SCE shall restrict work to daylight hours, except during an emergency, in order to avoid nighttime activities when desert tortoise may be present on the access road. Traffic speed shall be maintained at 15 mph or less in the work area.

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Desert tortoises ~~are not expected to occur within the proposed Project area with the exception of the approved Windhub Substation site at the northern terminus of Segment 10 (Windhub Substation is not a part of the proposed TRTP). At this site, several old historic burrows were identified and habitat is suitable for desert tortoise.~~could occur in the proposed Project area in Segments 4 and 10 where suitable

habitat is present. Construction activities that result in the take of desert tortoise, a federally and state-listed species, would constitute a significant impact and would be authorized only through the context of a Biological Opinion issued from the FWS and an Incidental Take Authorization from CDFG. To reduce impacts to desert tortoise SCE shall implement Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-10 (Conduct surveys for desert tortoises and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Implementation of these measures would avoid or mitigate effects to this species, including loss of habitat, if present, thereby reducing potential impacts to a less-than-significant level (Class II).

Impact B-11: The Project ~~would~~ could result in mortality of desert tortoises as a result of increased predation by common ravens.

Construction of the proposed Project would increase the number and size of transmission towers and substation-associated structures that provide potential nest sites for common ravens (*Corvus corax*) and raptors. These species are known predators of juvenile desert tortoises and other small species that have the potential to occur in the Northern Region. A total of 165 and 96 new towers are proposed for Segments 4 and 10, respectively, and the Whirlwind substation is proposed at the southern terminus of Segment 10 (SCE, 2007).

Common ravens are known to nest and perch on transmission towers and are opportunistic predators that will prey upon wildlife species in the vicinity of the transmission towers. Perch sites, human activities, and the availability of prey items have lead to substantial increases in raven populations in desert regions particularly near human development (Flat-Tailed Horned Lizard Interagency Coordinating Committee, 2003; Steenhof et al., 1993). The new towers from the proposed Project ~~would~~ could result in an increase in potential nesting and perching sites for common ravens in the Antelope Valley where the desert tortoise ~~has some potential to~~ occurs at low densities. However, raven population increases appear to be more associated with increased food supplies made available via human disposal (e.g., landfills, dumpsters, and litter) than access to perch sites (Kristan et al., 2004). In addition, perch sites in the proposed Project area do not appear to be a limiting factor as many of the existing towers are utilized by ravens and other birds as roosting sites and Joshua trees are relatively abundant in the northernmost portion of the Project where desert tortoises have the potential to occur. Population increases, if they occur, are expected to be small and food supplies are not expected to change appreciably. Therefore, increased predation on the desert tortoise, if present, is not expected to result from additional towers.

CEQA Significance Conclusion

Increases in common raven populations may occur as a result of the increased availability of potential nest sites. Population increases, if they occur, are expected to be small because nest sites in the area are not limited and food supplies are not expected to change appreciably. Therefore, increased predation on the desert tortoise is not expected to result from additional towers, and impacts are considered to be less than significant (Class III).

Threatened, Endangered, and Special-status Fish

Impact B-12: The Project ~~would~~ could result in the loss of special-status fish.

Four special-status fish species have the potential to occur in the proposed Project area. These include the federally listed Santa Ana sucker (*Catostomus santaanae*); the State and federally listed unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*); and two Forest Service sensitive species and California Species of Special Concern, the arroyo chub (*Gila orcuttii*) and Santa Ana speckled dace (*Rhinichthys osculus* ssp. 8) ~~These include the federally listed Santa Ana sucker (*Catostomus santaanae*), the State and federally listed unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), and the arroyo chub (*Gila orcuttii*) and Santa Ana speckled dace (*Rhinichthys osculus* ssp. 8), both California Species of Special Concern.~~ The unarmored threespine stickleback is also a State designated fully protected species.

The unarmored threespine stickleback was once widely distributed in the Los Angeles basin; however, its current distribution is limited to the upper Santa Clara River, San Antonio Creek, and Whitewater River (Moyle, 2002). ~~Critical habitat has been proposed for this taxon (USFWS, 2002) though it does not occur in any portion of the Project area. The Soledad Canyon zone, the nearest area of proposed critical habitat for unarmored threespine stickleback, lies approximately three miles west of the area of the Segment 11 span of Aliso Creek.~~ Unarmored threespine sticklebacks are not expected to occur within the Project area but do occur approximately 6 miles downstream of this Project.

The Santa Ana sucker is known to occur in Big Tujunga Creek, the San Gabriel River, and the Santa Ana River (Moyle, 2002; USFWS, 2005f; CNDDB, 2007). Designated critical habitat Unit 2 for the Santa Ana sucker occurs along the West Fork San Gabriel River beginning at Cogswell Reservoir. Road 2N25, which runs adjacent to the West Fork San Gabriel River in the vicinity of critical habitat Unit 2, would be used as an access road by SCE. In addition, a portion of designated critical habitat Unit 3 for Santa Ana sucker occurs in Big Tujunga Canyon near the Project area (USFWS, 2005f). ~~Streams on the ANF are the primary refugia for Santa Ana suckers.~~ The few remaining populations of this species require site-specific management. The primary threats to existing small populations are habitat fragmentation, habitat degradation, stream flow alterations, and introduced species. Heavy recreational use and building of "recreational dams" to pool water for instream water play may also contribute to the decline of the species. On Big Tujunga Creek these species are expected to occur downstream of the dam and would not be directly affected by activities conducted at the Big Tujunga Crossing upgrade, because any in-stream sedimentation increases resulting from this project would settle out in the reservoir and would not be transferred downstream. However, portions of Big Tujunga Creek are located downstream of potential tower locations where sediment could reach the creek if Best Management Practices were not employed.

In the Project area the arroyo chub is known to occur in Big Tujunga Creek and the west, east, and north forks of the San Gabriel River.

The Santa Ana speckled dace's range has diminished dramatically to the headwaters of the San Gabriel and Santa Ana Rivers (Moyle and others, 1995). The largest remaining population of Santa Ana speckled dace is on the ANF on lower reaches of the east, north, and west forks of the San Gabriel River including Cattle Canyon, Bear Creek, and Fish Canyon (Swift and others, 1993). Other reported occurrences include Pacoima Creek, Little Tujunga Creek, and Big Tujunga Creek, but more recent information indicates these populations may now be extirpated (Moyle and others, 1995).

If special-status fish species are present, direct impacts could include mortality due to crushing by heavy equipment and vehicles, and water quality degradation caused by increased sedimentation, erosion, or accidental chemical spills. Indirect impacts could include loss of suitable breeding and spawning habitat, removal of riparian and aquatic vegetation, and decreased water quality due to sedimentation and erosion. Operational impacts would be similar due to an increase in human presence as a result of facilitated public use of new and improved spur roads and access roads.

Although the Project would result in soil disturbance in many areas, data from the *GIS-Based Erosion & Sediment Analysis Report* (Appendix A of the Hydrology and Water Quality Specialist Report for the TRTP) conducted for this Project indicate that with BMPs approximately 950 tons of sediment per year over baseline would be deposited at Big Tujunga Creek east of the reservoir due to tower construction and road improvements upslope of this area. This amount of sedimentation constitutes an increase of 2.1 percent over baseline (46,002 tons/year at this location). An increase of 2.1 percent would not be considered large as the total amount of sediment generated by any given storm event could vary by several orders of magnitude. Thus, sediment production in the project area is a highly dynamic process, and Project-generated sedimentation would be minimal compared to natural variation.

Data from the *GIS-Based Erosion & Sediment Analysis Report* also indicate that with BMPs approximately 577 tons of sediment per year over baseline would be deposited at Butterfield Canyon and the West Fork San Gabriel River due to road improvements upslope of this area. Under baseline conditions, 45,666 tons of sediment was modeled as being deposited annually at this location. This total amounts to an increase of approximately 1.2 percent, which, as described above, is within the natural variation of any given rain year and would not be considered a large increase over baseline conditions. An important consideration regarding potential effects to the fish species in the Project area is the contribution of sediment from other watersheds not considered in the analysis for this project. For example, the total contribution of sediment that would be discharged at Butterfield Canyon as a result of the proposed Project does not take into account the total amount of sediment that the numerous other creeks and tributary drainages with expansive watersheds contribute to the West Fork San Gabriel River watershed during storm events. While not quantified, based on the size of these watersheds compared to the watersheds considered in the analysis for this project, it is likely that the total sediment loads are at least an order of magnitude higher than the contribution from the project.

Project-related construction activities including the construction of all-weather crossings at Big Tujunga River, the San Gabriel River, road upgrades, and vehicle passage through tributary drainages could result in injury or mortality of the Santa Ana sucker, arroyo chub, and Santa Ana speckled dace if present. The construction and use of access and spur roads can also have detrimental effects on fish populations by creating barriers to movement. See Impact B-4 for a complete discussion of the effects of access and spur roads. However, the distribution of these species is limited within the proposed Project area due to the location of two major dams and their associated reservoirs (Tujunga and Cogswell). Populations of Santa Ana sucker that occur in the West Fork of the San Gabriel River would not be directly affected by Project construction activities as the tower sites are located upstream of the Cogswell Reservoir. However, access to the Project would occur along a paved section of road that parallels the West Fork of the San Gabriel River from Highway 39 to the dam at Cogswell Reservoir (West Fork Cogswell Road). Santa Ana sucker, Santa Ana speckled dace, and arroyo chub are all known to occur in this section of the river. This road is located immediately adjacent to the river and numerous small ephemeral and intermittent drainages provide tributary flow into the river along this section of the San Gabriel River. In some areas these drainages cross the road as Arizona crossings or small culverts. Vehicle access through these areas when

supporting flowing water could result in mortality to Santa Ana suckers and other fish, if present. An inspection of each of the tributary drainages conducted by Aspen in May 2009 indicated that some of the tributaries have barriers (i.e., drop structures or other physical features) that would inhibit movement to upstream areas. In addition, the road areas lack habitat features that would support aggregations of fish on the roadway. Nonetheless, while Santa Ana suckers are not expected to linger on the roadway it is possible that this species could be present in some of the tributaries on an occasional basis while dispersing to upstream areas (Baskin pers. comm., 2009), during extremely high flow events. This would be true for other special-status fish species as well. However, to minimize or avoid direct effects SCE would place plates or other approved structures across the Arizona crossings to prevent direct vehicle contact with water if deemed necessary by the FWS or the FS (Mitigation Measure B-12).

Proposed Project activities upslope from aquatic habitats could also generate runoff, adversely affecting special-status fishes. Project-generated runoff could result in mortality or sublethal effects to all life stages of special-status fishes. Runoff could include erosional silt and spills of toxic chemicals that may be washed into aquatic habitats during rain events. Toxic chemicals subject to spillage and runoff include, but are not limited to, engine fuels (e.g., gasoline and diesel); motor oil; hydraulic fluid; and various other oils, greases, and solvents. Silt can adhere to the eggs of fishes and interrupt gas exchange, while toxic chemicals may poison inhabitants of aquatic habitats.

Direct effects to unarmored threespine stickleback are not likely to occur from Project construction. This species occurs outside of the proposed Project area and would not be subject to direct take from construction or vehicle access. Sediment transport from upslope areas to water supporting this species is also not expected to result in direct or indirect effects to the species. Data from the hydrologic and sediment transport analysis (Please see Section 3.8 [Hydrology]) conducted for this Project indicate that even under the most extreme erosion caused by the Project the downstream contribution of sediments to areas supporting this species would be ~~negligible~~minimal. That is, with BMPs in place, the total maximum annual sedimentation in tons per year would contribute approximately 3.4 percent above baseline tonnage over any given storm event at Aliso Canyon and the Santa Clara River and 1.7 percent at Kentucky Springs and the Santa Clara River. This total is well within the natural variation that occurs within any given year and would not result in a large contribution of sediment or result in levels of turbidity much above those currently caused by natural storm events. In addition, where the Project crosses Aliso Canyon and Kentucky Springs are approximately 6.5 and 6 miles upstream from the area where this species is known to occur in Soledad Canyon. An important consideration regarding potential effects to this species is the contribution of sediment from other watersheds not considered in the analysis for this project. For example, the total contribution of sediment that would be discharged at Aliso Canyon or Kentucky Springs as a result of the proposed Project does not take into account the total amount of sediment that the numerous other creeks and tributary drainages with expansive watersheds contribute to the Santa Clara River watershed during storm events. While not quantified, based on the size of these watersheds compared to the watersheds considered in the analysis for this project, it is likely that the total sediment loads are at least an order of magnitude higher than the contribution from the project. With the exception of the wettest years, most of the Santa Clara River in this area remains dry except during major storm events.~~That is the total maximum annual erosion in tons/acre would contribute approximately 10 percent above baseline tonnage over any given storm event at Aliso Canyon and the Santa Clarita River and 4.9 percent at Kentucky Springs and the Santa Clara River. This total is well within the natural variation that occurs within any given storm event and would not result in a large contribution of sediment~~

~~or result in levels of turbidity above natural storm events. With the implementation of best management practices to control erosion the total sediment load would be further reduced by 30 to 50 percent.~~

Populations of Santa Ana sucker that are present in portions of Aliso Creek and the Santa Ana River occur well outside the Project area and construction activities would not occur within the watersheds supporting these species.

Impacts to Santa Ana sucker, speckled dace, and arroyo chub may occur from vehicle access and construction activities conducted at Big Tujunga Creek and the West Fork of the San Gabriel River. ~~Populations of Santa Ana sucker that are present in portions of Aliso Creek and the Santa Ana River occur well outside the Project area and construction activities would not occur within the watersheds supporting these species.~~ As described above, vehicle access through and construction ~~through~~ within these areas when they ~~supporting~~contain flowing water could result in mortality to Santa Ana suckers, speckled dace, and arroyo chub if present. Take of Santa Ana sucker would only be authorized through the context of a Biological Opinion. In addition, SCE would be required to obtain a Streambed Alteration Agreement from CDFG for any activities that would modify the bed or banks of a State jurisdictional waterway, which would provide further measures for the protection of aquatic resources.

To reduce these effects SCE shall implement a series of measures that would limit construction activities during periods of high flow, avoid vehicle crossings of tributary drainages to the West Fork of the San Gabriel River along West Fork Cogswell Road, survey and monitor work in stream areas, implement best management practices to reduce the off-site transport of sediment-laden waters into adjacent water bodies, require the development of avoidance measures for riparian crossings, and develop a RCA treatment plan that identifies the specific measures that would be implemented to reduce effects to riparian-dependent species. These measures include Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-12 (Implement avoidance and minimization measures for ~~fish~~ Santa Ana sucker and other aquatic organisms).

Mitigation Measures for Impact B-12

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-8b **Conduct biological monitoring.** (See full description under discussion for Impact B-8)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** (See full description under Hydrology, Section 3.8).

H-1b **Dry weather construction.** (See full description under Hydrology, Section 3.8).

B-12 **Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms.** On or near the West Fork Cogswell road, SCE shall pre-stage a complete Hazardous Material Spill kit(s) capable of containing the largest potential ~~a large~~ vehicle spill of gasoline, diesel, or other hazardous materials. The kit(s) shall be located and maintained in areas accessible to crews in the event a bridge or other road blockage has occurred. Contents of the kit(s) shall be approved by the FS. A biological monitor with knowledge of the special-status fishes known to occur in the area shall inspect the roadway a minimum of three times a day from October 1 to April 30 and one time a day from May 1 through September 30 (unless otherwise approved by the FS) during construction to inspect for leaks, spills, or other debris that may enter the San Gabriel River. Spills on the roadway will be logged and reported to the FS and CPUC monitor weekly and cleaned up immediately. Any spills ~~that reach the San Gabriel River~~along this road will be reported to the FS~~, FWS,~~ and CPUC within one hour.

No loitering, maintenance, refueling, or equipment staging shall occur on the West Fork Cogswell road. Prior to vehicle access, metal plates, bridges, or other FS-approved structures shall be placed above all wet crossings, if deemed necessary by the FWS or the FS.

Prior to any work in the San Gabriel River, Big Tujunga River, or their tributaries where flowing or ponded water is present SCE shall conduct surveys for fish and other special-status aquatic organisms. The species noted in the project area shall be reported to the FS. No work shall be conducted in the flowing portion of the stream and water shall be diverted around the work area in a manner that does not restrict the movement of aquatic organisms unless authorized by the FS ~~and CDFG (through the context of a Streambed Alteration Agreement)~~. Block nets or other barriers may be required, if deemed necessary by the FWS or the FS, and if fish or other special-status species are present. Block nets will not be used in areas supporting Santa Ana suckers. All activities that occur within ponded or flowing water shall be coordinated with the FS on NFS lands. Quarterly for duration of construction work in the San Gabriel and Big Tujunga Rivers, SCE shall prepare a report documenting the type and number of species located and any actions taken to relocate or exclude the species. This shall be reported to the FS and CPUC no later than 30 days following the completion of work at the San Gabriel or Big Tujunga Rivers.

If Santa Ana suckers occur in ~~live~~ portions of the creek where construction activities are scheduled to occur, SCE shall retain a qualified biologist with a FWS permit for the Santa Ana sucker to monitor all construction activities in occupied Santa Ana sucker habitat and assist SCE in the implementation of the monitoring program. The resumes of the proposed biologists will be provided to the CPUC and FS for concurrence. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will have the authority to stop all activities until appropriate corrective measures have been completed.

CEQA Significance Conclusion

The introduction of excessive silt or toxic chemicals could result in significant direct and indirect impacts to special-status fishes. Riparian habitat could also be impacted at drainages within the ANF where these species may occur. However, implementation of Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure

B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms) would reduce these impacts to less-than-significant levels (Class II).

Impact B-13: The Project ~~would~~ could result in the loss of critical habitat for the Santa Ana sucker.

Critical habitat for Santa Ana sucker exists downstream of Cogswell Reservoir, in an area that would include an access road for heavy equipment. This access road is paved and runs for approximately 7.4 miles adjacent to the West Fork San Gabriel River (West Fork Cogswell Road). Use of this access road could result in accidental spills, increased turbidity due to vehicles using wet crossings, and potentially alter light and temperature regimes from the trimming and/or removal of some riparian vegetation. As described under Impact B-12, vehicle passage through flowing water or leakage onto roadways that is transported into the river during storm events could result in the degradation of habitat.

Direct loss of critical habitat for this species would not occur from the proposed Project. However, degradation of critical habitat may occur from the accidental release of mud, petroleum products, heavy metals, or other construction materials. However, through the implementation of Project minimization measures described under Impact B-12 these effects would be minimized or avoided. With the implementation of these measures the Project would not appreciably diminish the value of the habitat or affect the constituent elements required for occupancy by this species. Operational effects would not occur because once the Project has been completed use of the West Fork Cogswell Road would not occur.

Mitigation measures have been identified that would reduce impacts to critical habitat for the Santa Ana sucker. These measures include Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-12 (Implement avoidance and minimization measures for fish and aquatic organisms).

Mitigation Measures for Impact B-13

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-8b **Conduct biological monitoring.** (See full description under discussion for Impact B-8)

B-12 **Implement avoidance and minimization measures for fish and aquatic organisms.** (See full description under discussion for Impact B-12)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** (See full description under Hydrology, Section 3.8).

H-1b **Dry weather construction.** (See full description under Hydrology, Section 3.8).

CEQA Significance Conclusion

Direct loss of critical habitat for this species would not occur from the proposed Project. However, degradation of critical habitat may occur from the accidental release of mud, petroleum products, heavy metals, or other construction materials without implementation of the mitigation measures. However, through the implementation of Project mitigation measures described under Impact B-12 these effects would be minimized or avoided. With the implementation of these measures the Project would not appreciably diminish the value of the habitat or affect the constituent elements required for occupancy by this species. Therefore, impacts of the proposed Project on critical habitat for the Santa Ana sucker would be less than significant –with the implementation of mitigation (Class II). Operational effects would not occur because once the Project has been completed use of the West Fork Cogswell Road would not occur. Mitigation measures that would reduce impacts to Santa Ana sucker critical habitat include Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-12 (Implement avoidance and minimization measures for fish and aquatic organisms).

Threatened and Endangered Birds

Several state and federally listed bird species have the potential to occur in the proposed Project area. These species use a broad range of habitats, and one or more may occur within each of the proposed segments. Of particular importance are riparian areas, which support several listed neo-tropical migrant birds and coastal sage scrub habitats, which support the year-round resident coastal California gnatcatcher. Table 3.4-7 contains a complete inventory of the threatened and endangered avian species that could occur in the proposed Project area.

Impact B-14: The Project ~~would~~ could result in the loss of California condors.

The California condor is considered present within the Northern and Central Regions and may soar over portions of the Southern Region of the proposed Project. Although condors are not known to regularly use any particular site within the proposed Project, they do occur broadly over the proposed Project area during foraging trips. They have been documented roosting at Whittaker Peak, Bear Divide, and Mt. Lukens on the ANF. Their current distribution on NFS lands includes the western half of the ANF. Condors were last known to nest on the ANF in 1984 in Red Rock Canyon (J. Grantham, pers. comm.) Potential threats on NFS lands due to resource management activities include modification or loss of habitat components (primarily large trees), behavioral disturbance caused by vegetation treatment activities, facilities maintenance (including roads), and recreation. The greatest concern to condors in the Project area is their potential to collide with power lines. Bird collisions with power lines generally occur when a power line or other aerial structure transects a daily flight path used by a concentration of birds and when migrants travel at reduced altitudes and encounter tall structures in their path (Brown, 1993).

Collisions and electrocutions with electrical distribution structures were a significant mortality factor for the reintroduced population of California condors during the first several years of release efforts (Snyder and Snyder, 2000). Seven condors died due to collisions or electrocutions in California from December 1988 to June 1999 (Meretsky et al., 2000). ~~This threat was thought to have largely resulted from the tendency of young birds to associate with human structures (Snyder and Snyder 2000).~~ This hazard has

been greatly reduced by releases of birds that have been trained to avoid perching on mock utility poles fitted with electroshock mechanisms (Snyder and Snyder 2005). All recorded instances of collisions and electrocutions have been with distribution structures, and transmission lines and structures have not represented a collision or electrocution threat to the California condor (J. Burnett, personal communication). Condors have excellent eyesight (Snyder and Snyder, 2005) and do not fly during inclement weather, factors which may explain why they readily avoid transmission lines. Electrocution and collision risks to avian species are discussed in detail below under Impacts B-20 and B-21.

Direct impacts to condors, if present, could occur through the loss of or disruption of foraging habitat, noise from helicopter operation and ground-based construction activities, the introduction of micro-trash, and exposure to ethylene glycol antifreeze. Indirect effects could result from a disruption of normal foraging activity through the use of the new or improved access and spur roads and subsequent increase in human activities. Degradation and alteration of habitat due to construction activities could preclude use by condors. Operational effects would include collision or electrocution with the transmission line (see Impacts B-20 and B-21) and increased human presence and microtrash due to new or improved access and spur roads.

Construction activities such as construction of crane pads, towers, pulling/splicing locations, ~~concrete batch plants,~~ and staging areas, would result in the ~~clearing of large open areas~~loss of potential foraging habitat. Construction debris, litter, leaking equipment, or road kill can attract this species to the proposed Project. Condors are curious birds and have been documented in close association with oil pumps and human activity on the Los Padres National Forest. During cleanup activities at trash sites, condors have been observed sitting on guard rails adjacent to the cleanup activities. Adverse effects to condors have also been documented by the animal's collection of micro-trash (i.e., broken glass, paper and plastic waste, small pieces of metal). This waste is often brought back to nest sites where young birds ingest the material. This can lead to mortality of young birds. Ethylene glycol, a component in antifreeze and petroleum products can also be ingested by condors, ultimately leading to death. Increased access to remote parts of the ANF through road improvements or during construction activities can result in increased human use of the sites, recreational shooting, or hunting. ~~While lead ammunition has recently been banned for use in deer hunting, access to gut piles or prey remains subjected to lead can also result in lead poisoning in condors.~~

~~Several~~ Nearly 100 California condors have died in the wild since the beginning of the release program (Walters et al., 2008). For example, ~~I~~in California, four captive-raised individuals died after interactions with power lines, two drowned in steep-sided natural water courses, one died after consuming ethylene glycol, and one died from malnutrition and dehydration. Three birds died after being brought into captivity because of malnutrition, cancer, and a gunshot wound. Eight other birds have disappeared and are presumed dead (USFWS, 2001b).

There are no specific APMs that address impacts of the proposed Project on condors. However, construction of the proposed Project is not expected to adversely affect condor roost sites. The closest roost sites to the Project area include Mt. Lukens, which is ~~within one mile of~~approximately three miles from Segment 11. California condors are also known to roost at Bear Divide and Whittaker Peak, located over 5 miles from the Project. There are perch sites available in the dense forested areas of the ANF that are crossed by the line. Condors often return to traditional sites for perching and resting. Traditional roost sites include cliffs and large trees and snags (roost trees are often conifer snags 40 to 70 feet tall), often near feeding and nesting areas. Condors may remain at the roost site until midmorning, and generally return in mid- to late afternoon. It is anticipated that the expansion of condors back into their historical

range will continue, thus ~~impacting~~ the entire Project area could potentially support condors within the life of the Project.

Noise from helicopter operation is not expected to adversely affect this species as roost sites are not known to occur ~~in the region~~closer than three miles from the proposed Project. However, if condors are soaring in the region, helicopter use ~~would~~ could result in adverse effects to this species and may discourage the use of the area during the course of construction.

The loss of foraging habitat from the proposed Project is expected to be minimal, and restoration of disturbed sites would be completed at the conclusion of construction. Most foraging occurs in open terrain of foothills, grasslands, potreros with chaparral areas, or oak savannah habitats. Historically, foraging also occurred on beaches and large rivers along the Pacific coast (USFWS, 2005e). Water is required for drinking and bathing (Zeiner et al. 1990). Construction activities would result in the loss of habitat within the expected range of the condor. This consists of relatively small amounts of habitat compared to what is regionally available. In addition, condors that occur in the region forage on carrion and occur primarily at feeding stations in the Los Padres National Forest, well outside the Project area. However, condors are increasing their current range and moving into areas not recently inhabited by this species. Therefore, condors could move into and utilize the proposed Project area.

SCE would implement a series of APMs to reduce effects to wildlife. However, these measures lack the required specificity to ensure that the effects to condors are adequately minimized. Therefore, SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-14 (Monitor construction in condor habitat and remove trash and micro-trash from the work area daily) to avoid or mitigate take, including the loss of habitat and the potential for micro-trash ingestion.

Mitigation Measures for Impact B-14

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-8b **Conduct biological monitoring.** (See full description under discussion for Impact B-8)

B-14 **Monitor construction in condor habitat and remove trash and micro-trash from the work area daily.** SCE shall retain a qualified biologist with demonstrated ~~expertise~~ knowledge of~~for~~ California condor identifications~~s~~ to monitor all construction activities within the Project area and assist SCE in the implementation of the monitoring program. The resumes of the proposed biologist(s) will be provided to the CPUC and FS for concurrence. This biologist(s) will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within known condor-occupied areas. The authorized biologist will have the authority to stop all activities until appropriate corrective measures have been completed. If condors are observed in helicopter construction areas, SCE shall avoid

further helicopter use until the animals have left the area. The authorized biologist will have radio contact with the project foreman, who will be in radio contact with the helicopter pilot. The biologist will provide information to SCE to avoid conflicts with condors. All condor sightings in the Project area will be reported to the FWS and FS (on NFS lands). SCE will coordinate with FWS on the construction schedule and helicopter work areas to determine if any condors have been tracked or observed in the vicinity of the Project area. If condors are observed in helicopter construction areas, then SCE shall avoid further helicopter use until the animals have left the area and the FWS will be notified immediately. Should condors be found roosting within 0.5 miles of the construction area, no construction activity shall occur between 1 hour before sunset to 1 hour after sunrise, or until the condors leave the area. Should condors be found nesting within 1.5 miles of the construction area, no construction activity will occur until further authorization ~~occurs~~ from the FWS and FS on NFS lands.

Microtrash. All trash is required to be disposed of as written in the Proper Disposal of Construction Waste Plan for the Project. Additional language has been added to this Plan to address the disposal of microtrash. Workers will be trained on the issue of microtrash – what it is, its potential effects to California condors, and how to avoid the deposition of microtrash. In addition, daily sweeps of the work area will occur to collect and remove trash in locations with the potential for California condors to occur.

Worker Education. SCE will develop a flier that will be distributed to all workers on the project concerning information on the California condor. Information to be included consists of the following: species description with photos and/or drawings indicating how to identify the California condor and how to distinguish condors from turkey vultures and golden eagles; protective status and penalties for violation of the ESA; avoidance measures being implemented on the Project; and contact information for communicating condor sightings.

Reporting. All California condor sightings in the Project area will be reported directly to the FWS, FS, and CPUC. Prior to the commencement of helicopter activity, ~~a Project biologist~~SCE will ~~contact~~ coordinate with a FWS condor biologist to determine if any condors have been tracked or observed~~are flying~~ in the vicinity of the Project area.

CEQA Significance Conclusion

Construction activities associated with tower construction or operation could result in impacts to condor, if present. ~~Project actions that result in the take of this species would only be authorized through the context of a Biological Opinion from the FWS.~~ Electrocutions and/or line collisions as a result of Project implementation are discussed further under Impacts B-20 and B-21.

Impacts to condors from exposure to ethylene glycol, loss of habitat, loss of perch sites, or micro-trash ingestion would be considered significant absent mitigation **(**Class II**)**. As described above, SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-14 (Monitor construction in condor habitat and Monitor construction in condor habitat and remove trash and micro-trash from the work area daily) to avoid or mitigate take, including the loss of habitat and the potential for micro-trash ingestion. Implementation of these measures would reduce impacts to this species to less-than-significant levels **(**Class II**)**.

Impact B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.

~~Southwestern Ww~~Willow flycatchers of undetermined subspecies have been documented within the Project area, in Whittier Narrows, ~~and~~ in Upper Big Tujunga Canyon, and various other locations on the ANF.~~-~~ On the ANF, breeding southwestern willow flycatchers have been observed at upper Bear Creek, a tributary to the West Fork San Gabriel River, and Soledad Canyon, 7 miles west of the northern portion of Segment 6. ~~There is no known nesting of southwestern willow flycatchers within the ANF, and t~~The Project does not fall within critical habitat for the southwestern willow flycatcher~~s~~ (USFWS, 2005d). However, the Project is within the historical range of the species, and potentially suitable nesting habitat is present within portions of Amargosa Creek, the ANF particularly along the West Fork Cogswell Road and Upper Big Tujunga Creek, the Whittier Narrows Recreation Area, at the Whittier Narrows Nature Center, and at the Rio Hondo. Migrant flycatchers have also been noted at various times in the Puente Hills Landfill Native Habitat Preservation Authority lands and within the ANF at Piru Creek, near the Chilao Visitor Center, and in Bouquet Canyon. Surveys conducted by SCE in June of 2007 for willow flycatchers detected three individuals in the Whittier Narrows Recreation Area (Segment 8) and ~~a total of~~ seven ~~willow flycatchers~~individuals ~~in~~ on the ANF (Segments 6 and 11) ~~adjacent to the Whittier Narrows Nature Center and Recreation Area, along the Rio Hondo, and at San Jose Creek.~~(AMEC, 2008). Subsequent surveys by SCE in May and June of 2009 detected two individuals in Amargosa Creek, seven on the ANF, and three more in the Whittier Narrows Area (AMEC, 2009). These birds were determined to be migrants of a northern subspecies; however, the willow flycatcher is State endangered at the species level. Potential threats that have been identified on NFS lands are directed towards nesting habitat and include wildfires and resultant flooding, water diversion or extraction, unauthorized vehicle use, high levels of dispersed recreation, road and trail construction and use, invasive non-native vegetation, cowbird parasitism, and predation.

The least Bell's vireo is known to nest along portions of Segment 8 and directly adjacent to Segment 7. Nesting Least Bell's vireos have been confirmed at Rio Hondo, Tonner Canyon, the Whittier Narrows, Puente Hills Landfill Native Habitat Preservation Authority lands, and the Santa Fe Flood Control Basin. There is also potential least Bell's vireo habitat in riparian areas along Segments 6 and 11 on the ANF. This species has not been recorded nesting on NFS lands in the proposed Project area. However, as the species range continues to expand it is likely ~~this species will one day colonize~~to inhabit the foothill canyon portions of the ANF. The primary threats to this species on NFS lands include habitat degradation and parasitism by brown-headed cowbirds. Habitats suitable for least Bell's vireo within this segment include Southern Arroyo Willow Riparian Forest, Southern Cottonwood Willow Riparian Forest, Southern Sycamore Alder Riparian Woodland, Southern Willow Scrub, and Mule Fat Scrub. Construction activities may result in the loss of least Bell's vireo habitat due to installation of permanent structures and/or roads and disturbance from construction activities. The proposed Project may result in the loss of an estimated 0.5 acre of Southern Willow Scrub on Segment 7 and 1 acre of Southern Sycamore Alder Riparian Woodland on Segment 8. Some of this may be occupied by least Bell's vireos.

The yellow-billed cuckoo is not currently known to nest along the proposed Project. However, the Project is within the historical range of yellow-billed cuckoo, and marginally suitable nesting habitat is present in the Whittier Narrows Recreation Area, Whittier Narrows Nature Center, and the Rio Hondo. One individual yellow-billed cuckoo was observed in the project area at the Rio Hondo, just south of Segments 7 and 8, in 2009 (M. Benjamins, pers. comm.).

Based on the proposed Project design provided by SCE, the transmission lines would span these drainages, and disturbance or removal of riparian communities would be related to the upgrade of existing access and spur roads where they cross riparian habitat. Nevertheless, construction immediately adjacent to riparian habitats may affect nesting southwestern willow flycatchers, least Bell's vireos, and yellow-billed cuckoos should they occur. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. The construction and use of access roads in riparian areas could also disturb nesting riparian birds. See Impact B-4 for a complete discussion of the effects of access roads on wildlife.

Direct impacts to southwestern willow flycatchers, least Bell's vireos, or yellow-billed cuckoos could include disruption of breeding activity due to increased dust, noise, and human presence associated with construction activities, and the loss of habitat due to improvement of access roads and altered hydrology. Indirect impacts include the loss of habitat due to the establishment of noxious weeds and a disruption of breeding activity or the flushing of adult or fledging birds through the use of the new or improved access and spur roads by the public. Operational impacts include collision with transmission lines (see Impact B-21 below), loss of habitat due to vegetation trimming and removal during maintenance activities, and disturbance of birds due to the presence of maintenance personnel.

Many riparian birds including southwestern willow flycatcher, least Bell's vireo, yellow-billed cuckoo and other neo-tropical migrants are adversely affected by noise and human disturbance. Reijnen et al. (1995) demonstrated that for two species of European warbler (*Phylloscopus* spp.), sound levels between 26 dB(A) and 40 dB(A) reduced breeding density by up to 60 percent compared to areas without disturbance. In addition, while current sound thresholds for most birds in California are considered to be approximately 60 dB(A), this level may still adversely affect breeding success for least Bells vireo and southwestern willow flycatcher. W. Haas (personal communication, 2007) reported that in 1999, sound levels were recorded at 87 locations containing similar habitat conditions in the vicinity of the San Luis Rey River, the most robust and stable population of flycatchers in California. Data indicated that noise levels were the most important factor for occupancy. Based on sound levels, 90 percent of territories were occupied at levels at 49 dB(A), 75 percent at 51 dB(A), 50 percent at 53 dB(A), 25 percent at 55 dB(A), and no territories were occupied at 60 dB(A) (W. Haas personal communication, 2007). These data suggest disturbance from adjacent road noise and urban development may be a contributing factor in the use of habitat adjacent to developed areas.

Noise from helicopter operation could also affect these species if present on NFS lands. However, there has been no documentation that these species currently nest on the ANF. Human presence, as well as removal/disturbance of vegetation during construction would also have the potential to disrupt least Bell's vireos, particularly at access roads or staging areas if the transmission lines cross or are placed adjacent to riparian areas.

Corona noise associated with the operation of the proposed Project could potentially disrupt breeding birds. However, extensive research has not been conducted on the effects of corona noise on wildlife. Impacts related to corona noise are discussed further under Impact B-41.

One important factor in assessing effects to riparian birds is the unique habitat types used by each species. For example, least Bell's vireo will use riparian scrub communities that southwestern willow flycatcher and yellow-billed cuckoo generally avoid. Currently SCE does not have a specific APM intended to reduce effects to listed birds in the proposed Project area. Measures proposed by SCE that would reduce this effect include APMs BIO-1 through BIO-7. These APMs include conducting clearance surveys for

wildlife, minimizing vegetation removal at construction sites, avoiding streambeds to the extent practicable, implementing best management practices, biological monitoring, personnel training, and coordinating and compensating for effects to special-status wildlife with the regulatory agencies. However, as described above, these APMs lack specificity and clearly defined monitoring requirements. Therefore, to further reduce effects of the proposed Project to southwestern willow flycatcher, least Bell's vireo, and yellow-billed cuckoo, SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-5 (Conduct pre-construction surveys and monitoring for breeding birds), Mitigation Measure B-15 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). These surveys would include potential riparian habitat along access roads that cross various riparian drainages.

Mitigation Measures for Impact B-15

B-1a **Provide restoration/compensation for impacts to native vegetation communities**. (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-5 **Conduct pre-construction surveys and monitoring for breeding birds.** (See full description under discussion for Impact B-5)

B-15 **Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat.** If construction activities occur during the breeding season at the Whittier Narrows Recreation Area, Whittier Narrows Nature Center, Puente Hills Landfill Native Habitat Preservation Authority lands, and/or the Rio Hondo, or other areas including the ANF that have the potential to support listed riparian species, a qualified ornithologist shall conduct protocol surveys of the Project and adjacent areas within 500 feet. Fish and Wildlife Service (FWS) protocol surveys will be conducted for southwestern willow flycatcher~~,~~ and least Bell's vireo~~, and western yellow billed cuckoo~~. In known occupied habitat for listed riparian birds, SCE shall only conduct focused surveys of the Project and adjacent areas within 500 feet. The surveys shall be of adequate duration to verify potential nest sites if work is scheduled to occur during the breeding season.

Protocol or focused surveys, as appropriate, should be conducted~~,~~ within one year of start of construction and will continue annually until completion of construction activities~~can stop at commencement of construction activities~~. However, on NFS lands, annual surveys in suitable habitat may be required during construction. These surveys may be modified through the coordination with the FWS, CDFG, FS, USACE, State Parks (under Alternative 4), and the CPUC based on the condition of habitat, the observation of the species, or avoidance of riparian areas during the breeding season.

If a territory or nest is confirmed in a previously unoccupied area, the FWS and CDFG shall be notified immediately. On NFS lands, USACE lands, or State Park (under Alternative 4) lands, these agencies would be notified immediately. In coordination with the FWS and CDFG, a ~~300~~500-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted provided noise levels do not exceed 60 dB(A)hourly Leq at the edge of the nest site as determined by a qualified biologist in coordination with a qualified acoustician. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the biologist determines that the construction activities are disturbing nesting activities, the biologist shall have the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No construction or vehicle traffic shall occur within this buffer during the breeding season for these~~is~~ species.

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

H-1a Implement an Erosion Control Plan and demonstrate compliance with water quality permits. (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

Implementation of the proposed Project, without implementing the mitigation measures, could result in disturbance that causes southwestern willow flycatchers, least Bell's vireos, or yellow-billed cuckoos to abandon their nests and/or result in the loss of reproductive effort. This impact would be considered significant without mitigation **(**Class II**)**. Take of these federally and state-listed species through loss of habitat would only be authorized in the context of a Biological Opinion issued by the FWS and an Incidental Take Authorization from CDFG. As described above, to reduce impacts of the proposed Project to southwestern willow flycatcher, least Bell's vireo, and yellow-billed cuckoo, SCE shall implement a series of mitigation measures intended to reduce or avoid direct and indirect impacts of construction on this species. These include Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-5 (Conduct pre-construction surveys and monitoring for breeding birds), Mitigation Measure B-15 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Impact B-16: The Project would result in the loss of coastal California gnatcatchers.

The coastal California gnatcatcher is known to nest within the Southern Region along Segments 7 and 8 in the Montebello Hills, Santa Fe Dam Recreation Area east of Interstate 605 (CNDDB, 2009; M. Long, pers. comm.),~~Coyote Hills near Fullerton,~~ and the Puente-Chino Hills. Suitable Coastal Sage Scrub habitat within the proposed Project also exists along the San Gabriel River within the Whittier Narrows Recreation Area. During ~~focused~~ protocol surveys conducted in August 2007 through January 2008 and in April through June 2009, gnatcatchers were detected in the Montebello Hills along Segment 8, at the

Puente Hills Landfill Native Habitat Preservation Authority near Segment 8, Powder Canyon just north of Segment 8, and just south of Turnbull Canyon Road along Segment 8. ~~On the ANF, steep slopes at the southern end of Segments 6 and 11 support marginal, low suitability habitat for this species. However, the presence of this species cannot be ruled out in this area as a population that has been identified in the lower foothills of the eastern San Gabriel Mountains may extend into the ANF. The primary threats to this species on NFS lands include recreation, access, and adjacent land uses along lower elevation slopes supporting suitable coastal sage scrub habitat.~~

Direct impacts to coastal California gnatcatcher could include disruption of breeding activity due to increased dust, noise, and human presence associated with construction activities, and the loss of habitat due to improvement of access roads. Additional loss of habitat could occur through the construction of towers, crane pads, staging areas, pulling/splicing locations, and concrete batch plants. Indirect impacts include the loss of habitat due to the establishment of noxious weeds and a disruption of breeding activity or the flushing of adult or fledging birds through the use of the new or improved access and spur roads by the public. Operational impacts include collision with transmission lines (see Impact B-21 below), loss of habitat due to vegetation trimming and removal during maintenance activities, and disturbance of birds due to the presence of maintenance personnel.

Ground-disturbing activity, including tower pad preparation and construction and grading of new access roads, has the potential to disturb vegetation used by nesting birds. See Impact B-4 for a complete discussion of the effects of access roads on wildlife. The removal of habitat during the breeding season would likely result in the displacement of breeding birds and the abandonment of active nests. Noise from helicopter operation, which would occur in many sections of the ANF could also adversely affect nesting birds. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment, which would constitute take. Therefore, SCE shall implement APMs BIO-2 and BIO-4 through BIO-6, Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-16 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-16

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-16 **Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures.** SCE shall conduct protocol surveys for coastal California gnatcatchers in areas supporting coastal sage scrub habitat that may be affected by the Project. In known occupied habitat for the California gnatcatcher, SCE shall only conduct focused surveys for coastal California gnatcatchers to determine the locations of nests and territories. Survey areas shall include a 500-foot buffer around Project disturbance areas.

If a territory or nest is confirmed, the FWS shall be notified immediately. In coordination with the FWS a 300-foot disturbance-free buffer shall be established and demarcated by fencing or flagging. This buffer may be adjusted provided noise levels do not exceed 60 dB(A)hourly Leq at the edge of the nest site as determined by a qualified biologist in coordination with a qualified acoustician. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the biologist determines that the construction activities are disturbing nesting activities, the biologist shall have the authority to halt the construction and shall devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off

vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nest site and the construction activities, and working in other areas until the young have fledged. If noise levels still exceed 60 dB(A) Leq hourly at the edge of nesting territories and/or a no-construction buffer cannot be maintained, construction shall be deferred in that area until the nestlings have fledged. All active nests shall be monitored on a weekly basis until the nestlings fledge. No Project activities may occur in these areas unless otherwise authorized by FWS. SCE shall obtain incidental take authorization from the FWS prior to further activities.

Protocol or focused surveys, as appropriate, shall be conducted, at a minimum, within one year of start of construction and can stop at commencement of construction activities. These surveys may be modified through the coordination with the FS on NFS lands, USACE on USACE lands, State Parks in the Chino Hills State Park (Alternative 4 only), and the CPUC based on the condition of habitat, the observation of the species, or avoidance of nesting areas during the breeding season. Non-protocol nesting bird surveys for California gnatcatcher shall also occur in the Aliso Canyon in chaparral communities. This area shall also require a qualified gnatcatcher biologist to be present during any construction activities conducted during the breeding season.

Construction activities in occupied gnatcatcher habitat will be monitored by a full-time qualified biologist. The monitoring shall be of a sufficient intensity to ensure that the biologist could detect the presence of a bird in the construction area. At a minimum one full-time monitor shall be present for every two miles of active construction within occupied habitat.

SCE shall retain a FWS-permitted biologist to monitor construction activities within 100 feet of an active California gnatcatcher nests in the Montebello Hills area only and assist SCE in the implementation of the monitoring program. In the Montebello Hills, grading and vegetation management, including activities conducted during Project operations and maintenance, shall be conducted outside of the breeding season (March – August). A 300-foot buffer is required for all other areas. A biologist with applicable avian experience with the California gnatcatcher will monitor all construction activities within 300 feet of occupied California gnatcatcher habitat. The resumes of the permitted biologists will be provided to the CPUC for concurrence. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will have the authority to stop all activities until appropriate corrective measures have been completed.

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Project implementation could result in disturbance that causes coastal California gnatcatchers to abandon their nests and/or result in the loss of reproductive effort, resulting in significant impacts without mitigation. However, implementation of APMs BIO-4 through BIO-6, Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-16 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels **(**Class II**)**.

Impact B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.

The FWS designated 13 critical habitat units for the coastal California gnatcatcher, including two areas along Segment 7 (Montebello Hills and Whittier Narrows Recreation Area) and several portions along

Segment 8A in the Montebello, Puente, and Chino Hills including the Puente Hills Native Habitat Preservation Authority lands. The proposed transmission line would traverse 0.5 mile of designated critical habitat in Segment 7 and 8 miles of critical habitat in Segment 8.

Direct impacts to coastal California gnatcatcher habitat include loss of habitat due to grading and clearing for road improvements, staging areas, helicopter landing sites, pulling/splicing locations, etc. Indirect impacts to habitat include the accumulation of dust and the spread of noxious weeds. Operational impacts include the degradation of habitat due to increased human presence associated with use of new or improved access and spur roads by the public, and loss of habitat due to vegetation trimming and removal during maintenance activities.

Construction activities, including the installation of permanent structures and/or roads, would result in the loss of an estimated 2.4 acres (<0.001 acre permanent and 2.4 acres temporary) of gnatcatcher critical habitat on Segment 7 and ~~42.6~~ 44.8 acres (~~2.1~~ 4.4 acres permanent and 40.5 acres temporary) on Segment 8. Take of this federally listed species through loss of occupied habitat and/or modification of designated critical habitat would only be authorized in the context of a Biological Opinion issued by the FWS. However, the overall loss of critical habitat would be small and is not expected to diminish the value or remove essential constituent elements of occupied critical habitat for this species. By avoiding direct effects to the species during the breeding season and replacing lost habitat, the effects of the Project would be minimized. Therefore, to reduce the effects of the proposed Project on designated critical habitat SCE shall implement APMs BIO-2 and BIO-4 through BIO-6, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-16 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures), Mitigation Measure B-17 (Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-17

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-16 **Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures.** (See full description under discussion for Impact B-15)

B-17 **Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher.** To mitigate effects from Project construction, SCE shall acquire habitat occupied by the coastal California gnatcatcher and/or restore unoccupied coastal sage scrub. Mitigation acquisition shall occur at a 3:1 ratio for permanent effects unless otherwise approved by the FWS upon consultation. Temporary impacts will be mitigated at a 1:1 ratio on site. For lands located within the Montebello Hills HCP a 1:1 ratio for permanent effects will be implemented unless otherwise approved by the FWS. SCE shall enter into a binding legal agreement regarding the preservation of off-site lands describing the terms of the acquisition, enhancement, and management of those lands. Management of coastal California gnatcatcher mitigation areas will be necessary to maintain habitat suitability over time. Activities that need to be addressed in the management plan include disturbances that reduce shrub cover, such as frequent fire, mechanical disruption, livestock grazing, off-highway vehicle use, and military training activities. Fee title acquisition of these habitat lands or a conservation easement shall be

transferred to an entity approved by the FWS and the CPUC, along with funding for enhancement of the land and an endowment for management of the land in perpetuity.

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Project implementation could substantially reduce the number or restrict the range of coastal California gnatcatcher through loss of occupied habitat and would result in modification of designated critical habitat, resulting in significant impacts without mitigation. However, implementation of APMs BIO-4 through BIO-8, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-16 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures), and Mitigation Measure B-17 (Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher) would reduce impacts to less-than-significant levels (Class II).

Impact B-18: The Project ~~would~~ could disturb nesting Swainson's hawks.

The Swainson's hawk nests in areas such as riparian woodlands, roadside trees, trees along field borders, and the edges of remnant oak woodlands. There are five CNDDB records of Swainson's hawk in the vicinity of the proposed Project in the Northern Region, including two recent nest records within 10 miles. The two recent nest locations were re-evaluated during surveys for the Antelope Transmission Project. Surveys in 2007 found a nesting pair in one of the two locations, but the nest was unsuccessful. Nesting was not detected at the second location during 2007 and 2008 surveys (LSA, 2007 and 2008). However, CDFG considers a nest site to be active if it was used at least once during the past 5 years (CDFG, 1994b). Thus, these two nest locations are considered active. In addition, five active nests were observed during construction of the Antelope Transmission Project within four miles of the proposed Project in spring of 2009. Migrating Swainson's hawks have been observed in the past in the Puente Hills Landfill Native Habitat Preservation Authority lands. Although no records are within the proposed Project alignment, reconnaissance surveys in 2007 detected suitable foraging and nesting habitat in the Northern Region. Nesting Swainson's hawks, therefore, are considered likely within this region of the proposed Project. As such, construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment.

Direct impacts to Swainson's hawk could include disruption of breeding activity due to increased dust, noise, and human presence associated with construction activities, and the loss of habitat due to improvement of access roads. Additional loss of habitat could occur through the construction of towers, crane pads, staging areas, and pulling/splicing locations~~, and concrete batch plants~~. Indirect impacts include the loss of habitat due to the establishment of noxious weeds and a disruption of breeding activity or the flushing of adult or fledging birds through the use of the new or improved access and spur roads by the public. Operational impacts include ~~electrocution or~~ collision with transmission lines (see Impacts B-20 and B-21 below) and disturbance of birds due to the presence of maintenance personnel.

Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment, and buffer zones must be placed around nest locations to reduce this risk. CDFG recommends that the buffer zone be 0.25 mile in nesting areas away from urban development (CDFG 1994). These buffer zones may be adjusted as appropriate in consultation with a qualified ornithologist and CDFG. However, any actions that result in take of this species would require

an incidental take permit from the CDFG. Therefore, SCE shall implement APMs BIO-4 through BIO-6 and Mitigation Measures B-1b (Implement a Worker Environmental Awareness Program), B-18a (Conduct pre-construction surveys for Swainson's hawks), B-18b (Removal of nest trees for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-18

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-18a **Conduct pre-construction surveys for Swainson's hawks.** To assure that nesting Swainson's hawks are not disturbed by construction activities, a qualified ornithologist shall conduct pre-construction surveys within one mile of the Project in regions with suitable nesting habitat for Swainson's hawks. The survey periods follow a specified schedule: Period I occurs from 1 January to 20 March, Period II occurs from 20 March to 5 April, Period III occurs from 5 April to 20 April, Period IV occurs from 21 April to 10 June, and Period V occurs from June 10 to July 30. Surveys are not recommended during Period IV because identification is difficult, as the adults tend to remain within the nest for longer periods of time. No fewer than three surveys per period in at least two survey periods shall be completed immediately prior to the start of Project construction. If a nest site is found, consultation with CDFG shall be required to ensure Project construction will not result in nest disturbance. CDFG recommends that no new disturbances or other Project-related activities that may cause nest abandonment or forced fledging be initiated within 0.25 mile of an active nest between 1 March and 15 September, or until 15 August if a Management Authorization is obtained for the Project from the CDFG (CDFG, 1994). These buffer zones may be adjusted as appropriate in consultation with a qualified ornithologist and CDFG.

B-18b **Removal of nest trees for Swainson's hawks.** Nest trees for Swainson's hawks along the Project shall not be removed unless avoidance measures are determined to be infeasible. If a nest tree for a Swainson's hawk must be removed, a Management Authorization (including conditions to offset the loss of the nest tree) must be obtained from the CDFG. The Management Authorization will specify the tree removal period, generally between 1 October and 1 February. If construction or other Project-related activities that may cause nest abandonment by a Swainson's hawk or forced fledging are necessary within the specified buffer zone, monitoring of the nest site (funded by SCE) by a qualified biologist shall be required to determine if the nest is abandoned. If the nest is abandoned and if the nestlings are still alive, SCE shall fund the recovery and hacking (controlled release of captive reared young) of the nestling(s).

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Project implementation could result in disturbance that causes Swainson's hawks to abandon their nests or otherwise fail to reproduce, resulting in significant impacts without mitigation. However, implementation of APMs BIO-4 through BIO-6, Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measures B-18a (Conduct pre-construction surveys for Swainson's hawks), B-18b (Removal of nest trees for Swainson's hawks), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels **(**Class II**)**.

Impact B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.

Foraging habitat for Swainson's hawks includes dry land and irrigated pasture, alfalfa, fallow fields, low-growing row or field crops, rice land, and cereal grain crops (CDFG 1994). The primary foraging habitat for Swainson's hawks in the Antelope Valley is agricultural. The proposed Project will impact an estimated ~~49~~ 33.7 acres of this habitat within the Northern Region, primarily along Segment 4 (29.4 acres of temporary and 4.3 acres of permanent disturbance). Swainson's hawks may also forage in non-native annual grassland and desert scrub habitats present within the proposed Project.

Direct impacts to potential Swainson's hawk foraging habitat include the temporary and permanent loss of habitat due to grading and clearing for road improvements, staging areas, helicopter landing sites, pulling/splicing locations, tower locations, etc. Indirect impacts to habitat include the accumulation of dust and the spread of noxious weeds. Operational impacts include the ~~degradation of habitat due to increased human presence associated with use of new or improved access and spur roads by the public and~~potential loss of habitat due to vegetation trimming and removal during maintenance activities.

Loss of potential Swainson's hawk habitat would represent an adverse impact if active Swainson's hawk nests are present within 10 miles of the proposed Project, which is the average maximum distance from nests that pairs are known to forage (CDFG, 1994). Two active nests were documented within 10 miles of the proposed Project in 2005 (CNDDB, ~~2007~~2009) and may continue to be active in the future. Surveys conducted in 2007 for the Antelope Transmission Project detected a nesting pair with an unsuccessful nest in one of the two areas. Surveys conducted in 2008 for the same project did not find breeding activity at this location. These surveys did not detect breeding activity at the other location in 2007 or 2008 (LSA, 2007 and 2008). However, CDFG considers nest sites to be active if they have been used at least once in the past 5 years (CDFG, 1994b). Therefore, SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-18a (Conduct pre-construction surveys for Swainson's hawks), B-19 (Compensate for loss of foraging habitat for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-19

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-18a **Conduct pre-construction surveys for Swainson's hawks.** (See full description under discussion for Impact B-17)

B-19 **Compensate for loss of foraging habitat for Swainson's hawks.** Loss of foraging habitat for Swainson's hawks shall be mitigated by providing Habitat Management (HM) lands as described in the CDFG's *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California* (CDFG, 1994) because the site is known foraging habitat for Swainson's hawks. The final acreage of HM lands to be provided on site shall depend on the distance between the Project area and the nearest active nest site (CDFG, 1994), as determined by nest surveys conducted in the spring prior to Project construction. Guidance on the acreage of HM lands to be acquired by SCE can be found in the 1994 CDFG staff report.

Management Authorization holders/Project sponsors shall provide for the long-term management of the HM lands by funding a management endowment (the interest on which shall be used for managing the HM lands).

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Loss of foraging habitat for the Swainson's hawk as a result of Project implementation, without implementing the mitigation measures, could result in significant impacts to this species by substantially reducing the habitat available for the species. However, implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-18a (Conduct pre-construction surveys for Swainson's hawks), B-19 (Compensate for loss of foraging habitat for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II).

Impact B-20: The Project ~~would~~ could result in electrocution of State and/or federally protected birds.

Direct and operational impacts from the proposed Project would be the same and would include electrocution of large aerially perching bird species. Indirect effects associated with this impact would include increased risk of wildfire due to electrocuted birds or nests contacting flammable vegetation or other materials.

California condors, Swainson's hawks, bald and golden eagles, peregrine falcons, and other large aerial perching birds are susceptible to electrocution on power lines because of their large size, distribution, and proclivity to perch on tall structures that offer views of potential prey. The design characteristics of transmission towers/ poles are a major factor in raptor electrocutions. Electrocution occurs when a perching bird simultaneously contacts two energized phase conductors or an energized conductor and grounded hardware. This happens most frequently when a bird attempts to perch on a transmission tower/pole with insufficient clearance between these elements. Electrocution can occur when horizontal separation is less than the wrist-to-wrist (flesh-to-flesh) distance of a bird's wingspan or where vertical separation is less than a bird's length from head-to-foot. Electrocution can also occur when birds perched side-by-side span the distance between these elements (APLIC 2006).

The largest birds that could come in contact with the transmission lines of the proposed Project are the California condor (wingspan approximately 9 feet, height approximately 4.2 feet) and bald eagle with a wingspan of up to 8 feet (wrist-to-wrist length of 2.8 feet) and height (head-to-foot) up to 2.3 feet (APLIC, 2006). The golden eagle has a wingspan of up to 7.5 feet (wrist-to-wrist length of 3.5 feet) and height up to 2.2 feet (APLIC, 2006). The Swainson's hawk has a 4.5-foot wingspan, and can be 1.3 feet tall. The red-tailed hawk is the most common large bird that could come in contact with the subtransmission lines and are widespread in all three Project regions. The red-tailed hawk's wingspan is up to 4.7 feet (wrist-to-wrist length of 1.9 feet) and height up to 1.8 feet (APLIC, 2006). Other large birds that could come in contact with the ~~sub~~transmission lines are the turkey vulture (5.8-foot wingspan, two-foot wrist-to-wrist length, 1.8 feet tall) and great horned owl (4.3-foot wingspan, 2.1-foot wrist-to-wrist length, 1.3 feet tall) (APLIC, 2006). None of the wrist-to-wrist lengths (or even wingspans) or heights of these birds is long enough to simultaneously contact two energized phase conductors for the proposed Project. If they were to roost communally, there is some potential that multiple birds would

bridge the gap between two energized conductors. However, this would be difficult on a transmission line and the likelihood of this happening would be low.

Raptors that use the towers for nesting could be electrocuted while landing. Furthermore, nests may be built in areas that are susceptible to electrical charges that could result in fire as well as an electrical outage. ~~Although~~ However, the majority of raptor electrocutions are caused by lines that are energized at voltage levels between 1 kV and 69 kV, and "the likelihood of electrocutions occurring at voltages greater than 69 kV is extremely low" (APLIC 2006)~~), the proposed Project could result in the electrocution of State and/or federally protected bird species~~. ~~However~~Additionally, current guidelines for constructing transmission lines have been developed to minimize the potential effects from bird strikes and electrocution. To reduce the effects of the proposed Project SCE shall implement APMs BIO-4 and BIO-9, which state that SCE construction and operations crews will use BMPs, and that transmission facilities will be designed to be raptor-safe in accordance with the *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC, 2006). ~~On NFS lands raptor safety protection in the form of swan wrap will be required on towers/conductors (lines) on NFS lands where feasible.~~ Additional mitigation is not warranted.

CEQA Significance Conclusion

Although special-status birds may under some circumstances be subject to electrocution, the likelihood of electrocutions occurring at voltages greater than 69 kV is extremely low (APLIC 2006). With the implementation of SCE APM BIO-4 and APM BIO-9 (construct in accordance with the guidance on raptor protection in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* [APLIC 2006]); impacts to State and/or federally protected birds resulting from electrocution would be less than significant **(**Class III**)**.

Impact B-21: The Project ~~would~~ could result in collision with overhead wires by State and/or federally protected birds.

~~Direct effects associated with this impact would be the same as the operational effects and would include m~~Mortality of bird species due to collision with overhead power lines, towers, cranes, or other Project components could occur during construction as well as during operation of the proposed Project.

Bird collisions with power lines generally occur when: (1) a power line or other aerial structure transects a daily flight path used by a concentration of birds, or (2) migrants are traveling at reduced altitudes and encounter tall structures in their path (Brown, 1993). Collision rates generally increase in low light conditions, during inclement weather such as rain or snow, during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. Collisions are more probable near wetlands, valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths. Passerines (e.g., songbirds) and waterfowl (e.g., ducks) are known to collide with wires (APLIC, 2006), particularly during nocturnal migrations or poor weather conditions (Avery et al., 1978). However, passerines and waterfowl have a lower potential for collisions than larger birds, such as raptors. Some behavioral factors contribute to a lower collision mortality rate for these birds. Passerines and waterfowl tend to fly under power lines, while larger species generally fly over lines and risk colliding with higher static lines. Also, many smaller birds tend to reduce their flight activity during poor weather conditions (Avery et al., 1978).

It is difficult to predict the magnitude of collision-caused bird mortality without extensive information on bird species and movements in the proposed Project area. However, based on available information and

observations made during reconnaissance surveys, it is generally expected that collision mortality would be greatest where the movements of susceptible species are greatest (e.g., near wetlands, open water bodies, etc.), such as Legg Lake and Santa Fe Flood Control Basin (Appendix B of the *Biological Specialist Report* [Aspen and H.T. Harvey & Associates, 2009~~8~~], Avian Risk Assessment). ~~To reduce such mortality events, SCE would implement APM BIO-9 as part of the proposed Project in accordance with the guidance on raptor protection found in *Suggested Practices for Raptor Protection on Power Lines* (APLIC 2006).~~On NFS lands, raptor safety measures in the form of swan wrap will be required on towers/shield/conductor lines where it is deemed necessary by the FS. ~~–~~With the implementation of this measure impacts to avian species are minimized. No further mitigation is warranted.

CEQA Significance Conclusion

With the implementation of APM BIO-9 and the incorporation of raptor safety protection into the Project design (i.e. tower/conductor [lines] on NFS lands), impacts to State and/or federally protected birds resulting from transmission line collisions would be less than significant (Class III).

Threatened and Endangered Mammals

Impact B-22: The Project ~~would~~ could result in disturbance to Mohave ground squirrels.

The Mohave ground squirrel occupies open creosote bush scrub, alkali desert scrub, and Joshua tree woodland in areas with flat to moderate terrain. This species tends to avoid rocky areas and typically constructs burrows in sandy, alluvial, and gravelly soils (Best 1995).

The Mohave ground squirrel emerges from aestivation in spring, typically between mid-February and March, and actively forages for vegetation, seeds, arthropods, and fruit (Best 1995) and tends to stay close to its burrow while foraging. The breeding season occurs soon after emergence. After acquiring fat stores for hibernation, the Mohave ground squirrel typically enters aestivation in July or August.

Mohave ground squirrel habitat is primarily located within the Northern Region of the proposed Project, especially in areas within the Antelope Valley where Mojave creosote bush scrub, desert saltbush scrub (including desert wash), and Joshua tree woodland occur. In 2006 two potential observations of this species were recorded near Oak Creek Road close to the proposed Windhub site. In 2008 SCE conducted protocol surveys for this species near Oak Creek Road. Mohave ground squirrels were not observed or trapped during this event. While this area is generally outside the known range of the Mohave ground squirrel and habitat conditions do not meet the accepted criteria for this species there remains a potential for this species to be present based on the observations and known presence of this species in the region. Direct impacts to Mohave ground squirrel if present include crushing of burrows, mortality due to road kill, and loss of habitat. Indirect impacts include degradation of habitat due to the spread of noxious weeds and dust. Operational impacts include increased risk of road kill and disturbance due to increased use of access roads by the public and maintenance personnel.

Construction activities may result in take of individual Mohave ground squirrels within suitable habitat, if present. The largest threat to Mohave ground squirrel from the proposed Project would be crushing of burrows during grading and other construction activities. Individuals may also be hit by vehicles on access roads. See Impact B-4 for a complete discussion of the effects of access roads on wildlife. Take from Project implementation may also stem from loss of habitat due to installation of permanent structures and/or roads. Take of this State-listed species, including loss of habitat, would require a 2081 Incidental Take Permit from CDFG. Therefore, SCE shall implement APMs BIO-1 and BIO-4 through BIO-7, Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-

1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measures B-22a (Conduct focused surveys for Mohave ground squirrels), B-22b (Implement construction monitoring for Mohave ground squirrels), and B-22c (Preserve off-site habitat for the Mohave ground squirrel).

Mitigation Measures for Impact B-22

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-22a **Conduct protocol surveys for Mohave ground squirrels.** Protocol-level surveys for Mohave ground squirrels shall be performed in the portion of the Project containing suitable habitat for Mohave ground squirrel unless further consultation with the CDFG determines the surveys are not required. A qualified biologist will perform these surveys according to CDFG's (2003b) *Mohave Ground Squirrel Survey Guidelines*. The resumes of the proposed biologists will be provided to the CDFG and CPUC for concurrence prior to conducting the surveys.

If at any time a Mohave ground squirrel is detected, trapping will cease. If these surveys obtain positive results for Mohave ground squirrel, or if Mohave ground squirrel presence is assumed within potential habitat, SCE shall obtain incidental take authorization from CDFG. If these surveys determine that the Mohave ground squirrel is absent, then no further action is necessary.

B-22b **Implement construction monitoring for Mohave ground squirrels.** A qualified biological monitor shall be on the site to survey for Mohave ground squirrel during initial ground-disturbing activities. The resumes of the proposed biologists will be provided to the CDFG and CPUC for concurrence prior to conducting the surveys. The name and phone number of the biological monitor shall be provided to a CDFG regional representative at least 14 days before the initiation of ground-disturbing activities. If the biological monitor observes a Mohave ground squirrel on the construction site, determines that a Mohave ground squirrel was killed by Project-related activities during construction, or observes a dead Mohave ground squirrel, a written report shall be sent to CDFG within five calendar days. The report will include the date, time of the finding or incident (if known), and location of the carcass and circumstances of its death (if known). Mohave ground squirrel remains shall be collected and frozen as soon as possible, and CDFG shall be contacted regarding ultimate disposal of the remains.

B-22c **Preserve off-site habitat for the Mohave ground squirrel.** To mitigate potential permanent impacts to occupied Mohave ground squirrel habitat from Project construction, SCE will acquire habitat occupied by Mohave ground squirrels. Guidance on Habitat Management (HM) lands to be acquired by SCE can be found in CDFG's (2003b) *Mohave Ground Squirrel Survey Guidelines*.

- Three acres of off-site habitat supporting Mohave ground squirrels will be preserved for each acre of Mojave creosote bush scrub and Joshua tree woodland outside of the Habitat Conservation Area (HCA) delineated in the WMP.

- One acre of off-site habitat supporting Mohave ground squirrels will be preserved for each acre of desert saltbush scrub that includes desert wash impacted by the Project outside of the HCA delineated in the WMP.
- One-half acre of off-site habitat supporting Mohave ground squirrels will be preserved for each acre of desert saltbush scrub impacted by the Project outside of the HCA delineated in the WMP.
- No mitigation will occur for agricultural, California annual grassland, or barren/developed ground within the Project area north of Vincent Substation.

Mitigation acquisition shall occur at a CDFG-approved location and shall be coordinated through a CDFG-approved entity. SCE shall enter into a binding legal agreement regarding the preservation of off-site lands describing the terms of the acquisition, enhancement, and management of those lands. Fee title acquisition of habitat lands or a conservation easement over these lands will be transferred to an entity approved by CDFG and CPUC, along with funding for enhancement of the land and an endowment for permanent management of the lands. Management of off-highway vehicles is necessary on Mohave ground squirrel mitigation areas to prevent burrow collapse, especially during the aestivation season. Mitigation areas should be relatively flat with a perennial plant cover ranging from 10 to 20 percent (Zembal and Gall, 1980) and should support several plant species necessary for Mohave ground squirrel survival, including herbaceous annuals, winterfat (*Krascheninnikovia lanata*), spiny hopsage (*Grayia spinosa*), creosote bush (*Larrea tridentata*), and burrobush (*Ambrosia dumosa*) (Best, 1995).

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Project implementation could result in take of this State-listed species or loss of habitat, if present, resulting in significant impacts without mitigation. However, implementation of APMs BIO-4 through BIO-7, Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measures B-22a (Conduct focused surveys for Mohave ground squirrels), B-22b (Implement construction monitoring for Mohave ground squirrels), and B-22c (Preserve off-site habitat for the Mohave ground squirrel) would reduce impacts to less-than-significant levels (Class II).

Effects on a candidate, Forest Service Sensitive, or special-status species (Criterion BIO3)

Special-status Plants

At least seventy candidate, FS Sensitive, or special-status plant species have the potential to occur in areas of suitable habitat in the Project area. Table 3.4-21 presents the special-status plants that may occur within the proposed Project and the vegetation communities in which they may be found. Detailed descriptions, habitat preferences, and the known distribution of these species are presented in Appendix E of the *Biological Specialist Report* (Aspen and H.T. Harvey & Associates, 2009~~8~~). Many of these plant species are ephemeral in nature and include many spring-flowering annuals and herbaceous perennial species that are generally only visible during optimally timed field surveys in years of average rainfall or greater. Field surveys were conducted in 2006, 2007, 2008, and 2009 within the proposed Project area. ~~generally~~

Table 3.4-21. Vegetation Communities within the Proposed Project Potentially Supporting Candidate, Forest Service Sensitive, or Special-status Plant Species

Vegetation Community	Potentially Occurring Species			
Big Sagebrush Scrub	• Parry's spineflower	• Mojave Indian paintbrush		
Big Cone Douglas Fir-Canyon Oak Forest	• Mojave Indian paintbrush • Slender silver moss • San Bernardino aster • Palmer's mariposa lily	• Plummer's mariposa lily • Peirson's morning glory • San Gabriel bedstraw • Urn-flowered alumroot	• San Gabriel Mountains sunflower • Ocellated Humboldt lily • Lemon lily • San Gabriel linanthus	• Peirson's lupine • Rock monardella • Chickweed oxytheca • San Bernardino grass-of-Parnassus
Bunchgrass Grassland	• Thread-leaved brodiaea • Plummer's mariposa lily	• California androsace • Slender mariposa lily	• Round-leaved filaree • Southern tarplant	• Smooth tarplant
California Annual Grassland	• California androsace • San Bernardino aster • Braunton's milk-vetch • Thread-leaved brodiaea	• Slender mariposa lily • Plummer's mariposa lily • Peirson's morning glory	• Round-leaved filaree • Southern tarplant • Smooth tarplant	• Coulter's saltbush • Intermediate mariposa lily • Many-stemmed dudleya
California Bay Forest	• San Bernardino aster • Plummer's mariposa lily	• Peirson's morning glory • San Gabriel bedstraw	• Urn-flowered alumroot • Mesa horkelia	• Southern California black walnut
California Walnut Woodland	• California Androsace • Thread-leaved brodiaea	• Round-leaved filaree	• Southern California black walnut	• Ocellated Humboldt lily
Canyon Oak Forest	• San Bernardino aster • Plummer's mariposa lily • Peirson's morning glory	• San Gabriel bedstraw • Urn-flowered alumroot	• Mesa horkelia • Southern California black walnut	• Ocellated Humboldt lily • San Gabriel oak
Chamise Chaparral	• California androsace • Braunton's milk-vetch • Nevin's barberry • Slender mariposa lily • Palmer's mariposa lily • Plummer's mariposa lily	• Peirson's morning glory • Many-stemmed dudleya • San Gabriel bedstraw • Mesa horkelia • Southern California black walnut • Ocellated Humboldt lily	• San Gabriel linanthus • Rock monardella • San Gabriel oak • San Gabriel manzanita • Alkali mariposa lily • San Gabriel river dudleya	• San Gabriel Mountains dudleya • California satintail • Fragrant pitcher sage • Robinson's pepper-grass • Davidson's bush mallow • Short-joint beavertail cactus
Coast Live Oak Woodland	• California androsace • San Bernardino aster • Thread-leaved brodiaea	• Plummer's mariposa lily • Peirson's morning glory • Round-leaved filaree	• San Gabriel bedstraw • Urn-flowered alumroot • Mesa horkelia	• Southern California black walnut • Ocellated Humboldt lily
Coastal Sage Scrub	• California androsace • San Bernardino aster • Braunton's milk-vetch • Coulter's saltbush • Nevin's barberry • Thread-leaved brodiaea • Slender mariposa lily	• Plummer's mariposa lily • Peirson's morning glory • Intermediate mariposa lily • San Fernando Valley spineflower • Parry's spineflower • Slender-horned spineflower • San Gabriel river dudleya	• San Gabriel Mountains dudleya • Many-stemmed dudleya • Southern tarplant • Mesa horkelia • California satintail • Southern California black walnut • Robinson's pepper-grass	• Ocellated Humboldt lily • Davidson's bush mallow • Brand's phacelia • Chaparral sand-verbena • Davidson's saltscale • Rayless ragwort • Salt spring checkerbloom
Coulter Pine Forest	• Slender silver moss • San Bernardino aster • Palmer's mariposa lily • Plummer's mariposa lily	• Peirson's morning glory • Mt. Gleason Indian paintbrush • Urn-flowered alumroot • San Gabriel Mountains sunflower	• Ocellated Humboldt lily • Lemon lily • San Gabriel linanthus • Peirson's lupine	• Rock monardella • Chickweed oxytheca • San Bernardino grass-of-Parnassus • Mojave Indian paintbrush
Desert Bunchgrass Grassland	• California androsace	• Peirson's morning glory		
Desert Saltbush Scrub	• Alkali mariposa lily	• Peirson's morning glory	• Mason's neststraw	

Table 3.4-21. Vegetation Communities within the Proposed Project Potentially Supporting Candidate, Forest Service Sensitive, or Special-status Plant Species

Vegetation Community	Potentially Occurring Species			
Desert Wash	• San Fernando Valley spineflower • Parry's spineflower	• Pygmy poppy • White-bracted spineflower	• Lemmon's syntrichopappus	• Golden violet
Freshwater Marsh	• Southern tarplant			
Interior Live Oak Scrub	• California androsace • Braunton's milk-vetch • Slender mariposa lily • Palmer's mariposa lily	• Plummer's mariposa lily • Parry's spineflower • San Gabriel river dudleya • San Gabriel Mountains dudleya	• San Gabriel bedstraw • Mesa horkelia • California satintail • Fragrant pitcher sage	• Robinson's pepper-grass • Ocellated Humboldt lily • San Gabriel linanthus
Joshua Tree Woodland	• Peirson's lupine	• Lemmon's syntrichopappus	• Golden violet	
Mixed Chaparral	• Chaparral sand-verbena • California androsace • San Gabriel manzanita • Braunton's milk-vetch • Nevin's barberry • Slender mariposa lily • Palmer's mariposa lily • Plummer's mariposa lily	• Peirson's morning glory • Alkali mariposa lily • Intermediate mariposa lily • Parry's spineflower • San Gabriel river dudleya • San Gabriel Mountains dudleya • Many-stemmed dudleya • San Gabriel bedstraw	• Mesa horkelia • California satintail • Southern California black walnut • Fragrant pitcher sage • Robinson's pepper-grass • Ocellated Humboldt lily • San Gabriel linanthus	• Davidson's bush mallow • Rock monardella • Short-joint beavertail cactus • San Gabriel oak • Rayless ragwort • Salt spring checkerbloom • Lemmon's syntrichopappus
Mojave Creosote Bush Scrub	• Alkali mariposa lily	• Pygmy poppy		
Pinyon and Juniper Woodlands	• Mt. Gleason Indian paintbrush • Mojave Indian paintbrush • San Fernando Valley spineflower	• Parry's spineflower • White-bracted spineflower • Pygmy poppy	• Peirson's lupine • Short-joint beavertail cactus • Mason's neststraw	• Lemmon's syntrichopappus • Golden violet
Mojave Mixed Woody Scrub	• San Fernando Valley spineflower • Parry's spineflower	• Pygmy poppy	• Short-joint beavertail cactus	• Lemmon's syntichopappus
Mule Fat Scrub & Riversidean Alluvial Fan Sage Scrub	• Chaparral sand-verbena • San Fernando Valley spineflower	• Parry's spineflower • Slender-horned spineflower	• Mesa horkelia • Davidson's bush mallow	• Brand's phacelia
Scrub Oak Chaparral	• Chaparral sand-verbena • California androsace • San Gabriel manzanita • Braunton's milk-vetch • Nevin's barberry • Slender mariposa lily • Palmer's mariposa lily	• Plummer's mariposa lily • Peirson's morning glory • Alkali mariposa lily • Parry's spineflower • San Gabriel river dudleya • San Gabriel Mountains dudleya • Many-stemmed dudleya	• San Gabriel bedstraw • Mesa horkelia • California satintail • Southern California black walnut • Fragrant pitcher sage • Robinson's pepper-grass	• Ocellated Humboldt lily • San Gabriel linanthus • Davidson's bush mallow • Rock monardella • Short-joint beavertail cactus • San Gabriel oak
RiaprianForest, Woodlands, and Scrub	• San Bernardino aster • Nevin's barberry • Slender-horned spineflower	• Southern tarplant • Smooth tarplant	• California satintail • Ocellated Humboldt lily	• Greata's aster • Sonoron maiden fern
Sparsely Vegetated Streambeds	• Chaparral sand-verbena • San Fernando Valley spineflower	• Parry's spineflower • Sender-horned spineflower	• Mesa horkelia • Davidson's bush mallow	• Brand's phacelia

~~occurred well outside of the optimal flowering period. In addition, r~~Rainfall levels in the region of the proposed Project during the rainfall year of 2006-2007 were well below the seasonal annual average (approximately 19 percent of average). Rainfall levels of 2008 and 2009 were within the seasonal annual average. ~~As a result, focused surveys were conducted in the spring of 2008. These~~Multiple years of surveys provided excellent conditions for the detection of rare plants. During the 2007, 2008, and 2009 surveys several rare plants were identified in the proposed alignment and associated access and spur roads. These included: San Gabriel manzanita in Segments 6 and 11; ~~fragrant pitcher sage along road cuts in Segment 6;~~ California androsace in Segment 5; short-joint beavertail in Segments 5, 6, and 11; Greata's aster in Segments 6 and 11; Humboldt lily in Segment 11, giant bedstraw in Segment 6; San Gabriel oak in Segments 6 and 11, Coulter's Matilija poppy in Segment 11, intermediate mariposa lily in Segment 8, Peirson's morning glory in Segment 5 and 6, ~~and~~ California walnut in Segment 8 and along access roads in Segment 6 and 11, fragrant pitcher sage along access roads to Segment 6, San Gabriel River dudleya along access road to Seg 6, San Gabriel Mountains dudleya along access road to Segment 6, San Gabriel Mountains sunflower along access road to Segment 11, urn-flowered alumroot along access road to Segment 6, Mojave Indian paintbrush along access road to Segment 6, Lemmon's syntrichopappus on spur road in Segment 11, Plummer's mariposa lily along access roads to Segments 6 and 11, and Mt. Gleason Indian paintbrush on Alternative 6 helicopter site 4. In addition, California walnut and Catalina mariposa lily occur within the Chino Hills Alternatives.

Impact B-23: The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.

Direct impacts to the special-status plant species listed in Table 3.4-21 would be the same as described for listed plant species (Impact B-7) and may occur in a variety of ways, including the direct removal of plants during the course of construction. Clearing and grading associated with the placement of towers or the grading of access or spur roads may also result in the alteration of soil conditions, including the loss of native seed banks and changes to the topography and drainage of a site such that the capability of the habitat to support special-status species is impaired. Indirect impacts include the creation of conditions that are favorable for the invasion of weedy exotic species that prevent the establishment of desirable vegetation and may adversely affect wildlife. Construction on steep hillsides may also result in off-site sediment transport that may bury rare plants in adjacent habitat or alter soil conditions. Dust from road travel, grading, or other construction activities may also reduce photosynthetic capacity in plants over time or inhibit reproduction by physically coating reproductive structures or excluding insect pollinators. As previously described for vegetation communities, soil disturbance may also result in the spread of invasive plant species. See Impact B-4 for a complete discussion of the effects of the construction and use of access roads. Operational impacts would also be the same as described for listed plants under Impact B-7 and include trampling or crushing due to public use of new or improved spur roads and access roads, increased erosion, and the spread and colonization of noxious weeds. Other operational impacts include removal and trimming of vegetation during maintenance activities.

~~Special status plant species identified along the access/spur roads were fragrant pitcher sage, short joint beavertail cactus, Plummer's mariposa lily, California walnut, Greata's aster, San Gabriel manzanita, San Gabriel river dudleya, San Gabriel Mountains dudleya, Lemmon's syntrichopappus, Humboldt lily, and San Gabriel bedstraw. In many locations these species could be avoided by flagging prior to construction and working around known populations. However, at some locations road work may result in the loss of rare plants.~~

San Gabriel scrub oak, short joint beaver tail cactus and San Gabriel Manzanita were the most common FS Sensitive plants identified near tower sites. This is expected, as the dense stands of chaparral that occur at many of the tower sites exclude many other sensitive plant species. Although rare plants were only detected in a few areas, there is a potential for some species to occur in areas that have not been subject to intense focused surveys or may have failed to germinate even though the rain year was considered adequate to detect annual plants. If any of these species are encountered during pre-construction focused surveys, all individuals or populations within Project disturbance areas will be marked and avoided to the maximum extent possible. However, it is possible that some FS Sensitive plants would be subject to Project disturbance.

While not all the rare plants identified in the Project area would be subject to construction-related disturbance; it is likely that there will be a~~there remains the potential for the~~ loss or mortality ~~to~~ of some rare plants. Some of these species are more common in the region and include California black walnut, San Gabriel scrub oak, short joint beaver tail cactus, and Lemmon's syntrichopappus. These species are considered to be more common in the ANF and are therefore less susceptible to loss on a forest-wide level. However, other species including fragrant pitcher sage, San Gabriel river dudleya, San Gabriel Mountains dudleya, ~~Humboldt lily, Plummer's mariposa lily,~~ and San Gabriel bedstraw are of a more limited distribution and may be more susceptible to regional loss. However, as described above, impacts to many of the plant species identified in the Project area could likely be avoided or reduced through the implementation of Project minimization measures.

Species including California black walnut were noted in the Chino Hills and other rare plants may occur there as well. Spring 2008 surveys detected very few rare plants at or near the proposed tower sites in the Northern and Southern Regions. Tower locations are typically in areas already degraded beyond the ability to support most special-status species by sheep grazing (Northern Region) and heavy existing weed infestations (Southern Region). However, some areas have not been disturbed and larger impact areas, such as substations, helicopter pads, staging areas, and new access/spur roads will require careful surveys to determine the presence and location of any special-status plant species. Along existing access roads, roadside habitat is typically disturbed or compacted beyond the capability to support many special-status plants; however, some disturbance-tolerant species can occur in these areas.

Although rare plants were only detected in a few areas, there is a potential for some species to occur in areas that have not been subject to focused surveys. If any of these species are encountered, all individuals or populations within Project disturbance areas will be marked and avoided to the maximum extent possible. However, it is possible that some non-listed plants would be subject to Project disturbance. Typically impacts to a small number of non-state- or federally listed special-status plants (i.e., impacts to a few individuals) or impacts to a population where loss of the population would not negatively affect the range of the special-status plant species are not typically considered significant impacts under CEQA or NEPA. However, when impacts to non-listed special-status plant species are unavoidable, impacts shall be compensated through reseeding (with locally collected seed stock), or other FS, USACE, and CPUC (as appropriate) approved methods. If Project activities will result in the loss of more than 10 percent of the known individuals within the FS Sensitive, and/or special-status plant species occurrence to be impacted, SCE shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted).

SCE has indicated that APMs BIO-1 through BIO-7, described in Table 3.4-16, would be implemented as part of the proposed Project to avoid or minimize impacts to biological resources including rare plant species. These APMs include avoiding or compensating for impacts to unique vegetation communities,

training personnel, restricting work to within predetermined limits of construction, implementing Best Management Practices (BMPs), construction monitoring, flagging vegetation for avoidance, and revegetation with appropriate seed mixes. As proposed, the APMs do not provide mitigation ratios, do not specify time for the habitat restoration monitoring, state that only the Regulatory Agencies must be consulted on various issues, and do not specify what elements would be included in a Revegetation Plan. Because the APMs are not considered to be adequate protection for rare plants, the following mitigation measures are presented to further reduce impacts of the proposed Project on listed plants: Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants), and B-23 (Preserve off-site habitat/management of existing populations of special-status plants) below. The 2008 focused floristic surveys will be adequate to determine the distribution of rare plant species within the alignment for one year. However, there is some possibility that new populations of rare species could potentially establish in areas where they were not previously observed due to dispersal and/or a change in the existing conditions that could favor some rare species, such as a recent burn. Therefore, should Project construction take place after 2009, further focused clearance surveys of all impact areas will be required to determine potential presence of and distribution of rare plant species within the alignment.

Mitigation Measures for Impact B-23

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-7 **Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.** See full description under discussion for Impact B-7)

B-23 **Preserve off-site habitat/management of existing populations of special-status plants.** SCE shall conduct rare plant surveys, and implement avoidance/minimization/compensation strategies. SCE shall conduct surveys according to established and accepted protocol during the floristic period appropriate for each of the rare plant species identified with the potential to occur within the Project ROW and within 100 feet of all surface-disturbing activities. The completion of these surveys shall be coordinated with the CPUC and federal land manager. Populations of rare plants shall be flagged and mapped prior to construction. If rare plants are located during the focused surveys, then modification of the placement of structures, access roads, laydown areas, and other ground-disturbing activities would be implemented in order to avoid the plants, if feasible. A report of special-status plants observed shall be prepared and submitted to the CPUC, State Parks (for activities in CHSP associated with Alternative 4), and the federal land manager (FS and USACE). Impacts to non-listed plant species (i.e., FS Sensitive, CNPS List 1,2 and 4 species) shall first be avoided where feasible, and, where not feasible, impacts shall be compensated through reseeding (with locally collected seed stock), or other FS, USACE, and CPUC approved methods. If Project activities will result in loss of

more than 10 percent of the known individuals within an existing population of FS Sensitive, and/or special-status plant species SCE shall preserve existing off-site occupied habitat that is not already part of the public lands in perpetuity at a 2:1 mitigation ratio (habitat preserved: habitat impacted). On federal lands, this ratio may be reduced at the discretion of the federal land manager. The CPUC may reduce this ratio depending on the sensitivity of the plant on non-federal lands. The preserved habitat shall be occupied by the plant species impacted, and be of superior or similar habitat quality to the impacted areas in terms of soil features, extent of disturbance, habitat structure, and dominant species composition, as determined by a qualified plant ecologist.

All special-status plant species impacted by Project activities shall be documented in an annual report and submitted to the CPUC and federal land manager (FS and USACE). Where reseeding has occurred, SCE shall track the success of the plants during the course of the annual restoration monitoring. This information shall be submitted as part of the annual report to the CPUC and federal land manager (FS and USACE).

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

H-1a Implement an Erosion Control Plan and demonstrate compliance with water quality permits. (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

Several FS Sensitive plant species were identified during focused surveys of the proposed Project in the spring and summer of 2008. Ground-disturbing activities including road clearing and tower construction have the potential to disturb these species. Impacts to these species would be considered significant without mitigation **(**Class II**)**. However, impacts to special-status plant species would be reduced to a less-than-significant level through implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), and B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants), which will prevent the disturbance of any individuals or populations of these species through Project redesign and avoidance. In addition, if large numbers of rare plant species are affected SCE shall implement Mitigation Measure B-23 (Preserve off-site habitat/management of existing populations of special-status plants). As discussed above, indirect effects to these species that could occur due to the proliferation of noxious weeds resulting from ground-disturbing Project activities shall be reduced by the implementation of Mitigation Measure B-3a (Prepare and implement a Weed Control Plan). Indirect effects caused by erosion would be reduced through the implementation of Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits). A Worker Environmental Awareness Program would be provided through the implementation of Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program) to educate workers as to the sensitivity and potential for rare plants to occur.

Special-status Reptiles and Amphibians

Conditions in the proposed Project area provide habitat for numerous common and special-status reptiles and amphibians. Creeks and drainages, rocky outcrops, leaf litter, and friable soils provide an ample prey base and support conditions favorable to many species. Some of these species with the potential to occur include:

- Southwestern pond turtle
- Silvery legless lizard

- Two-striped garter snake
- Coast Range newt
- San Gabriel Mountains slender salamander
- Western spadefoot
- San Diego horned lizard
- California horned lizard
- Orange-throated whiptail
- Coastal rosy boa
- San Bernardino ringneck snake
- San Bernardino mountain kingsnake
- Coast patch-nosed snake
- Northern red diamond rattlesnake

Impact B-24: The Project ~~would~~ could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.

Construction activities will cross a number of small creeks and drainages, large reservoirs, and other suitable habitat for this species. Southwestern pond turtles have the potential to occur in a number of drainages and associated upland areas within the proposed Project including: Amargosa Creek, San Gabriel River (Segment 6-7), Big Tujunga Creek (Segment 6-11), Rio Hondo, Brea Canyon, and Tonner Creek. There is also one large population in the West Fork of the San Gabriel River below Cogswell Reservoir and smaller populations in Aliso Canyon and Alder Creek (Segment 11).

The pond turtle is normally found in and along riparian areas, although gravid females have been reported to nest more than 1,300 feet away from the nearest aquatic habitat (Holland 1994). Pond turtles may also make overland movements up to one mile between areas of aquatic habitat (Bury, 1972 in Ernst et al., 1994). The preferred habitat for these turtles includes ponds or slow-moving water with numerous basking sites (logs, rocks, etc.), food sources (plants, aquatic invertebrates, and carrion), and few predators (raccoons, introduced fishes, and bullfrogs). Juvenile and adult turtles are commonly seen basking in the sun at appropriate sites, although they are extremely wary animals and often dive into the water at any perception of danger.

Direct effects to southwestern pond turtle may occur from construction activity as a result of mechanical crushing; loss of nesting, breeding or basking sites; and human trampling. Disturbance would be associated with the removal of vegetation, construction and widening of access and spur roads, excavation of footings, and tower construction adjacent to areas that support this species. Disruption of basking activity and potential impacts to southwestern pond turtles may result from construction activities, if pond turtles are moving from the creek to basking sites. Access road use including grading of existing roads or spur roads could also result in direct mortality from mechanical crushing or from the importation of sediment laden waters into existing drainages. See Impact B-4 for a full discussion of the impacts of the construction and use of access roads on wildlife.

Direct impacts to southwestern pond turtles could also result from temporary impacts to water quality, fugitive dust, temporary loss of upland nesting sites and foraging habitat, disruption of breeding activity, or disturbance of basking sites. Juvenile southwestern pond turtles typically move from nesting sites in adjacent upland or riparian areas to the stream in the spring (Buskirk, 1992). Hatchlings are very small, often less than one inch, and may be inadvertently trampled during Project construction. In addition, access to zooplankton, an important hatchling food source, may be disrupted if water quality were to be severely degraded by Project construction.

Indirect impacts to southwestern pond turtle would include alteration of habitat that would preclude pond turtle use, degradation of water quality over time due to siltation and sedimentation, and the spread of noxious weeds. Operational impacts include risk of mortality by vehicles and disturbance on access roads due to increased use by the public and maintenance personnel. Other operational impacts include removal and trimming of vegetation during maintenance activities.

The greatest potential for injury or mortality to southwestern pond turtles as a result of proposed Project activities is the damage or destruction of nesting areas. Since southwestern pond turtles often nest communally, damage or destruction of a nesting area could result in injury or mortality to a large number of incubating eggs or hatchling turtles and could disrupt egg-laying activities of adult female turtles.

Populations of this species that occur in the West Fork of the San Gabriel River would not be directly affected by Project construction activities as the tower sites are located upstream of the Cogswell Reservoir. However, access to the Project would occur along a paved section of road that parallels the West Fork of the San Gabriel River from Highway 39 to the dam at Cogswell Reservoir. This road is located immediately adjacent to the river for several miles and is consistently within the riparian canopy. Numerous small ephemeral and intermittent drainages are also present in the canyon and provide tributary flow into the river along this section of the San Gabriel River. In some areas these drainages cross the access road as Arizona crossings or small culverts. Vehicle access through these areas when supporting flowing water could result in mortality to young or dispersing turtles, if present.

This existing West Fork Cogswell Road is paved and runs adjacent to the West Fork San Gabriel River. Use of this access road could result in accidental spills, increased turbidity due to vehicles using wet crossings, and potentially alter light regimes from the trimming and/or removal of some riparian vegetation to accommodate large vehicle passage. As described above, disturbance from vehicle traffic may result in disturbance to pond turtles at basking sites along this access road.

Construction activities conducted at the two perennial waterways (i.e., Upper Big Tujunga Creek and the West Fork of the San Gabriel River) where this species could occur could result in either direct mortality or adverse effects from sediment or chemical leaks.

To reduce effects of the proposed Project on pond turtles and other small reptiles or amphibians SCE would implement APMs BIO-1 through BIO-8. These APMs include conducting clearance surveys for wildlife, worker training, conducting special-status species surveys, and coordinating with wildlife agencies. However, as described above these APMs lack specificity and clearly defined monitoring requirements. Therefore, to further reduce effects of the proposed Project SCE will implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for fish and aquatic organisms), Mitigation Measure B-24 (Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-24

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-12 **Implement avoidance and minimization measures for fish and aquatic organisms.** (See full description under discussion for Impact B-12)

B-24 **Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures.** A qualified biologist shall conduct focused surveys for southwestern pond turtle in the area of Project crossings, including access and spur roads, at Amargosa Creek, Big Tujunga Creek (Segment 6), Alder Creek, Rio Hondo Substation, Whittier Narrows Recreation Area, Aliso Creek, and Tonner Creek. Since Southwestern pond turtles were observed at the San Gabriel River (Segments 6 and 7 and West Fork/Cogswell Road) and Brea Canyon during reconnaissance surveys conducted in September 2007, the species shall be assumed present at these locations. The resume of the proposed biologists will be provided to the CPUC, FS, and USACE (as appropriate) for concurrence prior to conducting the surveys. This biologist will be referred to as the authorized biologist hereafter. Focused surveys shall also occur on access and spur roads where road crossings could affect suitable habitat for ~~these~~ this species. Focused surveys shall consist of a minimum of four daytime surveys, to be completed between 1 April and 1 June. The survey schedule may be adjusted in consultation with the CPUC, FS, and/or USACE, as appropriate, to reflect the existing weather or stream conditions. If southwestern pond turtles are detected in or adjacent to the Project, nesting surveys shall be conducted.

Focused surveys for evidence of southwestern pond turtle nesting shall be conducted in, or adjacent to, the Project when suitable nesting habitat exists within 1,300 feet of occupied habitat in an area where Project-related ground disturbance will occur (i.e., tower sites, access/spur roads, wire setup sites, marshalling yards). If both of those conditions are met, a qualified biologist shall conduct focused, systematic surveys for southwestern pond turtle nesting sites. The survey area shall include all suitable nesting habitat located within 1,300 feet of occupied habitat in which Project-related ground disturbance will occur. This area may be adjusted based on the existing topographical features on a case-by-case basis with the approval of the CPUC, FS, and/or USACE, as appropriate. Surveys will entail searching for evidence of pond turtle nesting, including remnant eggshell fragments, which may be found on the ground following nest depredation.

If a southwestern pond turtle nesting area would be adversely impacted by construction activities, SCE shall avoid the nesting area. If avoidance of the nesting area is determined to be infeasible, the authorized biologist shall coordinate with CDFG, CPUC, FS (on NFS lands), and USACE (on Army Corps lands) to identify if it is possible to relocate the pond turtles. Eggs or hatchlings shall not be moved without the written authorization from the CDFG and FS (on NFS lands).

A qualified biologist with demonstrated expertise with southwestern pond turtles shall monitor construction activities where pond turtles are present or assumed present. The resume of the proposed biologist will be provided to the CPUC, FS, and USACE (as appropriate) for concurrence prior to the onset of ground-disturbing activities. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to, or within, habitat that supports populations of southwestern pond turtles. If the installation of fencing is deemed necessary by the authorized biologist, one clearance survey for southwestern pond turtles shall be conducted at the time of the fence installation. Clearance surveys for southwestern pond turtles shall be conducted by the authorized biologist prior to the initiation of construction each day.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a Implement an Erosion Control Plan and demonstrate compliance with water quality permits. (See full description under Hydrology, Section 3.8)

H-1b Dry weather construction. (See full description under Hydrology, Section 3.8).

~~***Environmental Effects of Mitigation Measure B-24***~~

~~While Mitigation Measure B-24 is recommended to reduce impacts to southwestern pond turtle, this measure may adversely affect cultural resources. A Project redesign that would reroute the proposed transmission line would possibly damage any unknown cultural resources that may be located along the reroute. Such potential impacts are similar to the effects of other Project activities that may result in the unanticipated discovery of cultural resources, and would require the implementation of mitigation measures presented in Section 3.5 (Cultural Resources).~~

CEQA Significance Conclusion

If pond turtles are present, damage or destruction of southwestern pond turtle nesting areas would constitute a significant impact under CEQA without mitigation. Nesting areas are frequently used by multiple individuals, and suitable nesting habitat can be limited in many areas. Destruction of southwestern pond turtle nesting areas would result in a substantial reduction in numbers of this rare species. However, implementation of Mitigation Measure B-24 (Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures) would avoid damage or destruction of nesting areas or mitigate the loss of nesting habitat, thereby reducing potential impacts to a less-than-significant level **(**Class II**)**. Further, worker education would be provided through the implementation of Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program) and restoration of impacted areas would occur through implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities). Impacts related to the establishment and spread of noxious weeds would be reduced through implementation of Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measure B-12 (Implement avoidance and minimization measures for fish and aquatic organisms). Water quality impacts would be reduced through the implementation of Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) and Mitigation Measure H-1b (Dry weather construction). Impacts related to fugitive dust would be reduced through implementation of Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Impact B-25: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.

The two-striped garter snake is highly aquatic but may move considerable distances into upland habitats, even where permanent water is lacking. Two-striped garter snakes have been observed in riparian, freshwater marsh, coastal sage scrub, chaparral, oak woodland, and grassland habitats. Rathburn et al. (1993) found that these snakes tend to occupy streamside sites during the summer and switch to nearby upland habitats during the winter. The use of adjacent upland habitat places them at risk from clearing and grading activities associated with the proposed towers, stringing and pulling locations, helicopter staging areas, and construction of spur roads. Two-striped garter snakes were observed at various locations on the ANF during surveys in 2008.

The south coast garter snake occurs in marsh and adjacent meadow habitats. This species requires a permanent water source with well-developed riparian vegetation. South coast garter snakes forage on land or in pools away from fast-moving water. They are regarded as difficult to detect.

Within the proposed Project, these species have the potential to occur in the vicinity of perennial or nearly perennial aquatic habitat associated with a number of drainages, including Amargosa Creek, Aliso Creek, Lynx Gulch, Alder Creek, Upper Big Tujunga Creek, North Fork Mill Creek, West Fork San Gabriel River, Rio Hondo, and Tonner Creek. Two-striped garter snakes were observed in the riparian habitat by SCE biologists during the spring of 2008 at a riparian drainage in Lynx Gulch. This species has also been observed in Big Tujunga Creek. In addition, many of the small tributary drainages crossed by access roads could support these species. As discussed above under Impact B-4, construction activities and/or wet ford vehicular crossings of these drainages have the potential to result in mortality or injury of individual two-striped garter snakes and south coast garter snakes. Use of the West Fork Cogswell Road could also result in mortality from road kill.

Direct impacts due to construction activities include mortality or injury of individual two-striped garter snakes and south coast garter snakes as a result of mechanical crushing; loss of nesting, breeding or basking sites; fugitive dust; and human trampling. Other direct effects to these species include degradation of water quality through siltation caused by vehicles using wet ford stream crossings; removal of vegetation; and grading tower pads, staging areas, helicopter pads, and pulling sites. Indirect effects include compaction of soils and introduction of exotic plant species. Furthermore, Project implementation may result in loss of habitat due to permanent structures and/or roads and temporary loss of habitat from construction activities. Operational impacts include risk of mortality by vehicles and disturbance on access roads due to increased use by the public and maintenance personnel. Other operational impacts include removal and trimming of vegetation during maintenance activities.

To reduce effects of the proposed Project on two-striped garter snakes and south coast garter snakes, SCE would implement APMs BIO-1 through BIO-8. These APMs include conducting clearance surveys for wildlife, worker training, conducting special-status species surveys, and coordinating with wildlife agencies. However, these APMs lack specificity and clearly defined monitoring requirements. Therefore, to further reduce effects of the proposed Project SCE will implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-25 (Conduct focused surveys for two-striped garter snakes and south coast garter snakes and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-25

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-12 **Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms.** (See full description under discussion for Impact B-12)

B-25 **Conduct focused surveys for two-striped garter snakes and south coast garter snakes and implement monitoring, avoidance, and minimization measures.** A qualified biologist shall

conduct focused surveys for two-striped garter snakes (both on and off NFS lands) and south coast garter snakes (non-NFS lands only) where suitable habitat is present and directly impacted by construction vehicle access, or maintenance. The resume of the proposed biologists will be provided to the CPUC, FS and USACE (as appropriate) for concurrence prior to conducting the surveys. This biologist will be referred to as the authorized biologist hereafter. Focused surveys shall consist of a minimum of four daytime surveys, to be completed between 1 April and 1 September. The survey schedule may be adjusted in consultation with the CPUC, FS, and/or USACE to reflect the existing weather or stream conditions. If either species is detected in or adjacent to the Project or at any wet fords to be traversed by motorized vehicles as part of Project construction activities, the following minimization measures will be required. SCE shall retain a qualified ~~biologist~~ herpetologist with demonstrated expertise with ~~two-striped~~ garter snakes ~~and/or south coast garter snakes~~ to monitor construction activities. The resume of the proposed biologist will be provided to the CPUC, FS, and USACE (as appropriate) for concurrence prior to the onset of ground-disturbing activities or vehicular crossings at wet fords. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during all activities immediately adjacent to or within habitat that supports populations of the two-striped garter snake and/or south coast garter snake. Clearance surveys for garter snakes shall be conducted by the authorized biologist prior to the initiation of construction each day. Any snakes found within the area of disturbance or potentially affected by the Project will be relocated to the nearest suitable habitat that will not be affected by the Project.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits**. (See full description under Hydrology, Section 3.8)

H-1b **Dry weather construction.** (See full description under Hydrology, Section 3.8).

CEQA Significance Conclusion

Temporary and permanent habitat losses will be less than significant because ~~Project effects would be localized to stream crossings and riparian habitat away from crossings would not be directly impacted by Project construction. T~~the relatively small habitat losses that will be incurred to riparian vegetation during Project construction will not result in a substantial adverse effect to these California Species of Special Concern. Although few individuals are likely to be affected at any work site, the collective injuries and mortality of these species that may occur at multiple work sites across the proposed Project could result in a substantial reduction in numbers of these rare species, constituting a significant impact, without implementation of the mitigation measures. However, implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-25 (Conduct focused surveys for two-striped garter snakes and south coast garter snakes and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would minimize injury or mortality to these species, thereby reducing potential impacts to a less-than-significant level (Class II).

Impact B-26: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, Coast Range newts.

The Coast Range newt requires water for breeding, but uses adjacent upland habitat extensively. It is often found where water sources dry up for the summer, and during moist conditions, can be found beneath logs, boards, rocks, and in rodent burrows. This species can also be found in drier habitats such as oak forests, chaparral, and rolling grasslands. A permanent water source is not necessary as this species needs water only during breeding. In areas where newts utilize streams, they can be found in slow-moving areas and pools.

The range of the Coast Range newt within southern California is highly fragmented; however, Coast range newts have been identified on the ANF in several of the small drainages that cross the access roads on Segment 6 near Monrovia Peak. In addition, this species is likely to occur in many of the perennial or nearly perennial aquatic habitats on the south slopes of the San Gabriel Mountains. The primary threats to this species on NFS lands include predatory non-native species, maintenance of aquatic stream flows, water quality, and illegal collecting.

Direct impacts to Coast Range newts include mechanical crushing or road kill during construction, human trampling, loss of breeding sites due to water quality degradation, fugitive dust, and loss of foraging habitat. Indirect impacts include degradation of water quality through siltation caused by vehicles using wet ford stream crossings; removal of vegetation; and grading tower pads, staging areas, helicopter pads, roads, and pulling sites. Other indirect effects include compaction of soils and introduction of exotic plant species. Operational impacts include risk of mortality by vehicles and disturbance on access roads due to increased use by the public and maintenance personnel. Other operational impacts include removal and trimming of vegetation during maintenance activities.

Construction activities occurring within one mile of Lynx Gulch, drainages within Monrovia Canyon, Big Tujunga Creek, North Fork Mill Creek, and West Fork San Gabriel River, or wet ford vehicular crossings of those drainages have the potential to result in mortality or injury of Coast Range newts. The coast range newt is a slow-moving cryptic animal, which makes it vulnerable to mechanical crushing through trampling and the use of access roads. See Impact B-4 for a complete discussion of the impacts associated with the construction and use of access and spur roads. Coast range newt can also be subject to mortality through the clearing and grubbing of vegetation, if present. Degradation of water quality can preclude breeding. Furthermore, Project implementation may result in permanent loss of habitat due to permanent structures and/or roads and temporary loss of habitat due to disturbance from construction activities. To reduce effects of the proposed Project SCE would implement APMs BIO-1 through BIO-8. These APMs include conducting clearance surveys for wildlife, worker training, conducting special-status species surveys, and coordinating with wildlife agencies. However, these APMs lack specificity and clearly defined monitoring requirements. Therefore, SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-26 (Conduct focused surveys for coast range newts and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-26

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-26 **Conduct focused surveys for coast range newts and implement monitoring, avoidance, and minimization measures.** A qualified biologist shall conduct focused surveys for Coast Range newt in suitable habitat on non-NFS lands, including Eaton Wash, Brea Canyon, and Tonner Creek. In addition, all tributary drainages that support habitat for this species shall be inspected if they are subject to Project disturbance. Focused surveys shall consist of a minimum of four daytime surveys, to be completed between 1 April and 1 September. If Coast Range newts are detected in or adjacent to the Project or at any wet fords to be traversed by motorized vehicles as part of Project construction activities, no work shall be authorized within ~~one~~ 0.5 mile of the occupied active drainage channel and no vehicular crossings at fords of those channels shall be authorized until the biologist has inspected and cleared these areas.

SCE shall retain a qualified biologist with demonstrated expertise with ~~Coast Range newts~~amphibians to monitor construction activities and assist SCE in the implementation of the monitoring program. The resume of the proposed biologist will be provided to the CPUC for concurrence prior to the onset of ground-disturbing activities or vehicular crossings at wet fords. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during ground-disturbing activities immediately adjacent to or within habitat that supports populations of Coast Range newt. Clearance surveys for Coast Range newts shall be conducted by the authorized biologist prior to the initiation of construction each day. If individuals are found within the proposed area of disturbance they will be relocated to an area that will not be affected by construction activities.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits**. (See full description under Hydrology, Section 3.8)

H-1b **Dry weather construction.** (See full description under Hydrology, Section 3.8).

CEQA Significance Conclusion

Temporary and permanent habitat losses at individual work sites will be minor because suitable upland habitat is abundant throughout the proposed Project in locations where the Coast Range newt may occur, and the relatively small habitat losses that will be incurred during Project construction will not result in a substantial adverse effect to this California Species of Special Concern at a given location. While SCE will implement APMs BIO-1 through BIO-7 (Table 3.4-16) as part of the proposed Project, if present, injury or mortality to a substantial number of individuals of this California species of special concern would constitute a significant impact, without implementation of the mitigation measures. While the impacts to this species at individual work sites would be minor, the collective injuries and mortality of this species that may occur at multiple work sites across the proposed Project are significant and could result in a substantial reduction in numbers of this rare species. However, implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-26 (Conduct focused surveys for coast range newts and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality

permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid injury or mortality if present, thereby reducing impacts to a less-than-significant level (Class II).

Impact B-27: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.

Several other special-status reptiles and amphibians could be affected by the proposed Project. These include the following terrestrial California Species of Special Concern and FS Sensitive species:

- San Gabriel Mountains slender salamander (*Batrachoseps gabrieli*)
- Western spadefoot (*Spea hammondii*)
- San Diego horned lizard (*Phrynosoma coronatum blainvillii*)
- California horned lizard (*Phrynosoma coronatum frontale*)
- Silvery legless lizard (*Anniella pulchra pulchra*)
- Orange-throated whiptail (*Aspidoscelis hyperythra*)
- Coastal rosy boa (*Charina trivergata)*
- San Bernardino ringneck snake (*Diaophis punctatus modestus*)
- San Bernardino mountain kingsnake (*Lampropeltis zonata parvirubra*)
- Coast patch-nosed snake (*Salvadora hexalepis virgultea*)
- Northern red diamond rattlesnake (*Crotalus ruber ruber*)

Several of these species, including San Bernardino mountain kingsnake and an undetermined subspecies of the coast horned lizard, were detected during surveys in 2008 on the ANF. The San Bernardino ringneck snake, Northern red diamond rattlesnake, and Western spadefoot toad are known to occur within the Puente Hills Landfill Native Habitat Preservation Authority lands. Given the ecology of these species, and their cryptic nature it is likely that some or all of the species identified above may occur in the Project area. Hereafter, these species will be referred to collectively as special-status terrestrial herpetofauna. The special-status terrestrial herpetofauna potentially present in the Project area would all be subject to similar types of impacts. Direct impacts include being hit by vehicles on access roads; mechanical crushing during tower site preparation, grading of spur roads, and preparation of staging and stringing/pulling locations; fugitive dust; and general disturbance due to increased human activity. See Impact B-4 for a complete discussion of the impacts of the construction and use of access and spur roads on wildlife. Furthermore, Project implementation may result in permanent loss of habitat due to permanent structures and/or roads and temporary loss of habitat from construction activities. Individuals of one or more of the special-status terrestrial herpetofauna could be injured or killed during ground-disturbing Project activities in undeveloped upland habitats and in some developed areas throughout the proposed Project. Indirect impacts to these species include compaction of soils and the introduction of exotic plant species. Operational impacts include risk of mortality by vehicles and disturbance on access roads due to increased use by the public and maintenance personnel. Other operational impacts include removal and trimming of vegetation during maintenance activities.

To reduce effects of the proposed Project on small reptiles or amphibians SCE would implement APMs BIO-1 through BIO-8. These APMs include conducting clearance surveys for wildlife, worker training, conducting special-status species surveys, and coordinating with wildlife agencies. However, as previously described these APMs lack specificity and clearly defined monitoring requirements. Therefore

to further reduce effects of the proposed Project SCE will implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-27 (Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-27

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-27 **Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna.** A qualified biologist with demonstrated expertise with special-status terrestrial herpetofauna shall monitor all construction activities and assist SCE in the implementation of the monitoring efforts. The resume of the proposed biologist will be provided to the CPUC, USACE, and FS (as appropriate) for concurrence prior to the onset of ground-disturbing activities. This biologist will be referred to as the authorized biologist hereafter. The authorized biologist will be present during ground-disturbing activities immediately adjacent to or within habitat that supports populations of the special-status terrestrial herpetofauna. Any special-status terrestrial herpetofauna found within a Project impact area shall be salvaged by the authorized biologist and relocated to suitable habitat outside the impact area. If the installation of exclusion fencing is deemed necessary by the authorized biologist, the authorized biologist will direct the installation of the fence. Clearance surveys for special-status herpetofauna shall be conducted by the authorized biologist prior to the initiation of construction each day.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Temporary and permanent habitat losses will be less than significant because suitable upland habitat is abundant throughout the proposed Project in locations where special-status terrestrial herpetofauna may occur, and the relatively small habitat losses that will be incurred during Project construction will not result in a substantial adverse effect to these California Species of Special Concern and/or FS Sensitive species. While SCE will implement APMs BIO-1 through BIO-7 (Table 3.4-16) as part of the proposed Project, injury or mortality to a substantial number of individuals of these California Species of Special Concern and/or FS Sensitive species would constitute a significant impact, without implementation of the mitigation measures. Although the level of injury or mortality that may occur at individual work sites is unlikely to result in significant impacts to special-status terrestrial herpetofauna, the collective injuries and mortality of this set of species that may occur at multiple work sites across the proposed Project are significant and could result in a substantial reduction in numbers of these rare species. However, implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-27 (Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna), and

Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid injury or mortality, thereby reducing potential impacts to a less-than-significant level (Class II).

Special-Status Birds

Impact B-28: The Project ~~would~~ could disturb wintering mountain plovers.

Mountain plovers nest in the Great Plains but winter in portions of Central California, including the Antelope Valley. In the Project area, this species is known to winter in the Northern Region where they forage and roost mainly in recently tilled agricultural fields, although they are also known to roost in recently graded road beds. The proposed Project will affect approximately 24 acres of agriculture scattered along Segment 4 in the Northern Region. Of this acreage, an unknown portion would be recently tilled during the time of year (mid-October to mid-February) in which mountain plovers may be present.

Direct impacts due to construction activities, such as clearing and grading and increased human presence during this period, may temporarily disturb wintering flocks and force individuals to use suboptimal foraging habitat. However, suitable foraging habitat is regionally abundant in the Antelope Valley and Project implementation would not substantially reduce habitat available for this species, restrict its range, or cause its regional populations to drop below self-sustaining levels. It is also possible for the maintenance and/or improvement of access roads in the region to introduce new roosting habitat, although the amount of habitat this would provide would be negligible compared to what is regionally available. Indirect impacts to this species include the loss of habitat due to the establishment of noxious weeds and the flushing of adult or fledging birds through the use of the new or improved access and spur roads by the public. Operational impacts include ~~electrocution or~~ collision with transmission lines (see Impacts B-20 and B-21) and disturbance of birds due to the presence of maintenance personnel. Because of the wide availability of habitat in the region and the relatively small amount of habitat that would be impacted by the proposed Project, impacts to wintering mountain plovers would not be substantial.

CEQA Significance Conclusion

Because the total acreage of impacted habitat is small compared to what is available regionally, and implementation of the proposed Project would not restrict the range of the species, impacts to wintering mountain plovers resulting from construction disturbance would be less than significant (Class III).

Impact B-29: The Project would result in the loss of occupied burrowing owl habitat.

The burrowing owl, a CDFG Species of Special Concern, has been observed within the proposed Project area during reconnaissance-level surveys. Burrowing owls are known from the Puente Hills Landfill Native Habitat Preservation Authority, and there are several CNDDB records within, or in the vicinity of, the proposed Project. Burrow surveys conducted by SCE in March and August through November 2007 identified one burrowing owl and occupied habitat in the northern portion of Segment 6, as well as occupied habitat along Segment 8 near Cucamonga Creek. Suitable habitat exists along Segments 10, 4, 5, 6, 7, and 8. Burrowing owls can occur wherever there are natural or manmade burrows, such as ground squirrel burrows, drainage pipes, and rural road berms. This species is not known to nest on NFS lands, although few may occur along the lower margins of the forests where they come in contact with valleys that abut NFS lands. Management of NFS lands does not significantly influence the conservation status of this species given its range and habitat requirements (Stephenson and Calcarone, 1999).

Direct impacts to burrowing owls as a result of construction activities for the proposed Project would include the crushing of burrows, removal or disturbance of vegetation, increased noise levels from heavy equipment and helicopter operations, increased human presence, and exposure to fugitive dust. Indirect impacts could include the loss of habitat due to the colonization of noxious weeds and a disruption of breeding activity due to facilitated use of new or improved spur and access roads by the public. Operational impacts include increased human presence from maintenance personnel that would flush or otherwise disturb burrowing owls.

If burrowing owls are present within a construction zone, or adjacent to such an area, disturbance could destroy occupied burrows or cause the owls to abandon burrows. Construction during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. The loss of occupied burrowing owl habitat (habitat known to have been occupied by owls during the nesting season within the past three years) or reductions in the number of this rare species, directly or indirectly through nest abandonment or reproductive suppression, would constitute an adverse impact. Furthermore, raptors, including owls and their nests, are protected under both federal and State laws and regulations, including the Migratory Bird Treaty Act and California Fish and Game Code Section 3503.5.

To reduce effects of the proposed Project on burrowing owls SCE would implement APMs BIO-2 and BIO-4 through BIO-6; however, these measures do not specifically address impacts to owls. Therefore, to further reduce effects of the proposed Project SCE will implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-29 (Implement CDFG protocol for burrowing owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Implementation of these measures would reduce or avoid loss of occupied burrows for burrowing owl.

Mitigation Measures for Impact B-29

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-29 **Implement CDFG protocol for burrowing owls.** In conformance with federal and State regulations regarding the protection of raptors, a habitat assessment in accordance with CDFG protocol for burrowing owls (CBOC, 1993) shall be completed on non-NFS lands prior to the start of construction. Burrowing owl habitat within the Project area and within a 500-foot buffer zone shall be assessed ("Assessment Area"). If the habitat assessment concludes that the Assessment Area lacks suitable burrowing owl habitat, no additional action is required. However, if suitable habitat is located on the Assessment Area, all ground squirrel colonies or potential burrow locations shall be mapped at an appropriate scale, and the following mitigation measures shall be implemented:

- In conformance with federal and State regulations regarding the protection of raptors, a pre-construction survey for burrowing owls, in conformance with CDFG protocol, consisting of three site visits, shall be completed no more than 30 days prior to the start of construction within suitable habitat at the Project site(s) and buffer zone(s).

- Occupied burrows shall not be disturbed during the nesting season (1 February through 31 August) unless a qualified biologist approved by CDFG verifies through non-invasive methods that either the birds have not begun egg-laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Eviction outside the nesting season may be permitted pending evaluation of eviction plans and receipt of formal written approval from the CDFG authorizing the eviction.
- Any damaged or collapsed burrows will be replaced with artificial burrows in adjacent habitat.
- Unless otherwise authorized by CDFG, a 250-foot buffer, within which no activity will be permissible, will be maintained between Project activities and nesting burrowing owls during the nesting season. This protected area will remain in effect until 31 August or at CDFG's discretion and based upon monitoring evidence, until the young owls are foraging independently.
- If accidental take (disturbance, injury, or death of owls) occurs, the CDFG/CPUC/FS/USACE lead monitor will be notified immediately.

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Project implementation, without implementation of the mitigation measures, could substantially reduce the number or restrict the range of burrowing owls through loss of habitat, direct take, or disturbance during the breeding season that causes nest abandonment or reproductive suppression, resulting in significant impacts without mitigation. However, implementation of APMs BIO-2 and BIO-4 through BIO-8 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-29 (Implement CDFG protocol for burrowing owls), B-3a (Prepare and implement a Weed Control Plan), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II).

Impact B-30: The Project would result in the loss of occupied California spotted owl habitat.

California spotted owl is a FS Sensitive species and is known to be present on the ANF within portions of Segments 6 and 11 of the proposed Project, where they primarily utilize bigcone Douglas fir-canyon oak forest and canyon oak forest. Specifically, spotted owl Protected Activity Centers (PACs) have been identified near Mount Gleason Road near one of the proposed helicopter staging areas; south of Big Tujunga Creek along Big Tujunga Road; and at numerous locations along the primary access road (Shortcut trail 2N23). This road runs south from State Highway 2 to portions of Segment 6 just west of the San Gabriel Wilderness Area. This area supports the largest concentrations of owls and their habitat within the proposed Transmission Line ROW. In addition, some of the towers in this area may require helicopter construction techniques for demolition and erection. A helicopter staging area is also proposed for this area.

Direct effects to spotted owls would be similar to those described for nesting birds (Impact B-5). These effects would include the direct removal of habitat including possible nest trees and foraging areas; noise from human disturbance and construction equipment; fugitive dust; and vehicle travel along the access and spur roads that occur in the Project area.

Indirect effects would also be similar to those described for nesting birds and would include the degradation of foraging or nesting habitat, the spread of invasive weeds, and increased human disturbance as new areas of the forest would be accessible to recreationists.

Data collected as of 2008 indicate there are approximately 14 areas mapped as occupied or potential spotted owl habitat in or adjacent to the proposed Project or within the 2.5 mile helicopter buffer area. In addition, some of the line or proposed access roads may occur within these areas. The Project would likely occur within the territorial range of one or more spotted owls. On the ANF these territories can vary in size based on site-specific topography, prey density, and access to suitable nest trees. In some areas owls may occupy closely adjoining territories.

Construction within occupied habitat or immediately adjacent to occupied habitat during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. In particular, helicopter construction proposed in the vicinity of occupied spotted owl habitat, which could involve thousands of flights, would introduce a substantial amount of noise, vibration, dust, visual disturbance, and air turbulence. For the proposed Project, construction activities could include more than 9,000 trips across the forest. While not all of these occur in owl habitat, some towers would occur in or adjacent to occupied habitat. These factors could disrupt breeding activity and ultimately lead to avoidance of breeding altogether, or the failure of an already established nest. Construction would introduce noise from helicopter use, grading, improvement of spur roads, and construction of towers. Vehicle travel on the access roads would also result in dust, human activity, increased noise levels, and other anthropogenic disturbances. As the rugged terrain in many sections of the ANF limits vehicle access to many tower locations, helicopters would be required for both demolition and construction of approximately 33 towers.

The amount of suitable spotted owl habitat that will be removed by the Project is approximately 43.1 acres. In comparison, the home range requirement of a California spotted owl on the ANF ranges from 300-1200 acres, although this number can vary considerably. On other national Forests these ranges also vary. For example, Zimmerman et al. (2001) radio-tracked two pairs of spotted owls in the San Bernardino Mountains. Using four different estimators of home range size, they calculated home range sizes ranging from 519 to 1,025 acres for one pair and from 1,478 to 2,016 acres for the other.

In a worst-case scenario, the loss of 43.1 acres of suitable habitat along Segments 6 and 11 would constitute the loss of 14 percent of a home range for a single pair of spotted owls. However, it is unlikely that all of the impacts associated with one segment would occur within the territory of a single pair of owls. This loss of habitat alone spread over two segments will not contribute to a substantial loss of habitat for an owl or pair of owls. Furthermore, California spotted owls typically inhabit heterogeneous home ranges that include unsuitable habitats such as grassland and chaparral. Most of the vegetation that would be removed near spotted owl habitat consists of chaparral, which is not utilized for nesting or roosting. Patches of non-forested vegetation do not preclude owls from nesting in adjacent forests in southern California (Smith et al. 2002). However, the expansion of access roads and the grading of new spur roads would result in the removal of mature oaks, bay, and conifer trees depending on the location of the road. In addition, because California spotted owl nest sites are limited, and home range size varies greatly on the ANF, the loss of a nest tree, even outside of the breeding season, would represent an adverse effect to the species.

The greatest threat to this species on NFS lands is the loss of habitat and subsequent population loss due to large stand-replacement wildfires. As proposed, the Project would not interfere or impede any of the conservation guidelines proposed for spotted owls. Measures incorporated into the Project would minimize risk of wildland fire and the spread of invasive nonnative plants due to construction activities. Avoidance of nest sites would be achieved through the use of limited operating periods (LOP). The LOP would prohibit activities within ~~approximately 500 feet of the nest site (0.5 mile for helicopter~~

~~construction), or~~a protected activity center ~~where nest site is unknown,~~ during the breeding season (February 1 through August 15) unless surveys confirm that California spotted owls are not nesting. Limitations on the removal of vegetation and the restoration/mitigation of disturbed habitats would minimize impacts to habitat utilized by this species.

To reduce impacts of the proposed Project SCE shall implement APMs BIO-2 and BIO-4 through BIO-6. However, these measures do not specifically address impacts to spotted owls and lack clear strategies for reducing impacts to this species. Therefore SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). These measures would be utilized to restore impacted habitat and detect nesting trees or areas where occupied habitat is present. For a discussion of construction disturbance to breeding spotted owls, see Impact B-31 (The Project would disturb nesting California spotted owls).

Mitigation Measures for Impact B-30

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-30 **Conduct pre- and during construction nest surveys for spotted owls.** Prior to tree removal or construction activities within ~~bigcone Douglas fir canyon oak forest and canyon oak forest~~suitable habitat, SCE shall have a qualified biologist conduct FS protocol surveys ~~within suitable habitat~~ for the California spotted owl ~~during the breeding season (February 1 through August 15)~~ to establish or confirm the location of nests within the Project. The resumes of the proposed biologists shall be provided to the FS and CPUC for concurrence. If nests or breeding pairs are found during the surveys, the limited operating period (LOP) will be applied according to the Forest Plan (Standard 20 – Part 3). No project-related activities will be allowed within these dates (February 1-August 15) or until chicks have fledged~~a 500 foot disturbance free buffer shall be established around the nests in coordination with the FS and demarcated by fencing or flagging~~. Where a biological evaluation by a qualified ornithologist determines that a nest site would be shielded from planned activities by topographic or other features that would minimize disturbance, the buffer distance may be reduced upon approval of the FS on NFS lands. In addition, no helicopter construction will be allowed within 0.5 mile of breeding spotted owl territories. No helicopter overflights shall be authorized without FS approval. If approved minimum altitudes will be 300 feet above a territory at an altitude designated by the FS. This buffer may be adjusted through consultation with the FS and CPUC.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Because nest sites are limited, the loss of a potential nest tree would be considered significant without mitigation. Mitigation Measure B-30 would require surveys for nesting California spotted owls prior to tree removal or construction activities during the breeding season, and also requires the establishment of a disturbance-free buffer zone around any identified nests. Therefore, impacts to the California spotted owl resulting from loss of occupied habitat are considered less than significant (Class II) with the implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native

vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Impact B-31: The Project ~~would~~ could disturb nesting California spotted owls.

California spotted owls are known to be present within the ANF in Segments 6 and 11 of the proposed Project (Figure 3.4-5, located in the Map & Figures Series Volume). In many areas, both access roads and tower locations cross occupied habitat including known nesting areas. Direct impacts to nesting California spotted owls could include lower reproductive success, nest abandonment, predation, and increased stress levels due to chronic noise levels, fugitive dust, vibration, and air turbulence associated with heavy equipment and helicopter operations. Other direct impacts include the loss of suitable nest trees as a result of vegetation clearing for tower pads, tower removal sites, pulling and tensioning sites, and construction, grading, and widening of new spur roads and existing access roads. Operational impacts would include ~~electrocution or~~ collisions with transmission lines (see Impacts B-20 and B-21) and disturbance due to increased human presence as a result of public use of new or improved spur and access roads. Corona noise associated with the operation of the proposed Project could potentially disrupt breeding spotted owls. However, extensive research has not been conducted on the effects of corona noise on wildlife. Impacts related to corona noise are discussed further under Impact B-41.

Construction would introduce noise from helicopter use, grading, improvement of spur roads, and construction of towers. Vehicle travel on the access roads would also result in dust, human activity, increased noise levels, and other anthropogenic disturbances. As the rugged terrain in many sections of the ANF limits vehicle access to many tower locations, helicopters would be required for both demolition and construction of numerous towers.

Delaney et al. (1999) studied the effects of helicopter noise on Mexican spotted owls in New Mexico and found that spotted owl flushes (flight responses) increased with decreasing distance and increasing sound level. Further, they found that owls flushed more in response to chain saw noise than helicopter noise. However, they note that helicopters would have elicited a greater response from owls if the exposure times were increased through slow maneuvers such as hovering, which would occur during construction of the proposed Project. Owl flushing rates were the same in the breeding season and the non-breeding season, although owls did not flush when chicks were in the nest. Finally, the authors found no significant difference in reproductive success between owls exposed to helicopter and chain saw noise and those who were not exposed to these noise sources, but the population sizes were small enough that the authors may not have been able to detect an effect on reproduction. However, flushed owls are likely more prone to predation, stress, and repeated activity during the breeding season that could lower reproductive success. Another study by Tempel and Gutierrez (2003) used fecal corticosterone (a stress hormone) as a measure of physiological stress response in California spotted owls exposed to chain saw noise. They found no detectable increase in fecal corticosterone levels in owls exposed to a chain saw operating 100 meters away. However, they note that chronic and intense noise such as timber harvest and road construction was not examined during the study and may lead to increased stress response in owls. While these studies suggest that spotted owls can tolerate some degree of anthropogenic noise disturbance, the construction of the proposed Project would introduce chronic noise sources that could be nearer to breeding and non-breeding owls than the noise sources in these studies.

Construction within occupied habitat or immediately adjacent to occupied habitat during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest

abandonment. In particular, helicopter construction proposed in the vicinity of occupied spotted owl habitat would introduce a substantial amount of noise, vibration, dust, visual disturbance, and air turbulence. These factors could disrupt breeding activity and ultimately lead to avoidance of breeding altogether, or the failure of an already established nest. Noise and human disturbance impacts to spotted owls would be largely the same as those described for riparian birds (see Impact B-15) and include displacement from territories, interference with breeding, and abandonment of nests. To reduce impacts of the proposed Project SCE shall implement Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measures for Impact B-31

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-30 **Conduct pre- and during construction nest surveys for spotted owls.** (See full description under discussion for Impact B-30)

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Project implementation could result in disturbance that causes California spotted owls to abandon their nest and/or result in the loss of reproductive effort, resulting in significant impacts without mitigation. In particular, the use of helicopters for Project construction would introduce disturbance that could cause nest failure. However, implementation of APMs BIO-2 and BIO-4 through BIO-6, Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II).

Impact B-32: The Project ~~would~~ could disturb nesting avian "species of special concern."

Several passerine bird species listed as "species of special concern" by the CDFG, including ~~vermilion flycatcher~~, loggerhead shrike, yellow warbler, yellow-breasted chat, ~~summer tanager,~~ and tricolored blackbird, have been identified as either nesting or potentially nesting within the proposed Project.

Direct, indirect, and operational impacts to nesting birds would be the same as described for listed riparian birds (see Impact B-15) and spotted owls (see Impacts B-30 and B-31). Ground-disturbing activity, including tower pad preparation, stringing and pulling locations, and the grading of access roads, has the potential to disturb vegetation utilized by nesting birds. The construction and use of access roads could also disturb nesting birds. See Impact B-4 for a complete discussion of the effects of access roads on wildlife. Noise and human disturbance impacts to special status birds would be largely the same as those described for riparian birds (see Impact B-15) and spotted owls (see Impacts B-30 and B-31) and could result in the displacement from territories, interference with breeding, and abandonment of nests. The removal of habitat during the breeding season would likely result in the displacement of breeding birds and the abandonment of active nests. Increased noise from helicopter construction could also adversely impact nesting birds, particularly where helicopters are required to hover in or adjacent to riparian areas for extended periods of time. Breeding birds and other wildlife may temporarily or permanently leave

their territories to avoid construction activity, which could lead to reduced reproductive success and increased mortality.

While Project implementation would not substantially reduce habitat available for these species, restrict their range, or cause their regional populations to drop below self-sustaining levels, the direct or indirect loss of nests through physical removal, nest abandonment, or reproductive suppression of these regionally rare species would violate the MBTA and would constitute an adverse impact without mitigation. To reduce the effects of the proposed Project these species SCE would implement the same measures utilized for both common nesting birds and riparian species. This would include the replacement of lost habitat functions through the restoration of habitat, construction monitoring, pre-construction surveys, and the avoidance of nest locations. Therefore, to further reduce effects of the proposed Project on nesting birds SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct pre-construction surveys and monitoring for breeding birds), and AQ-1a (Implement Construction Fugitive Dust Control Plan). Many special-status birds on NFS lands will also benefit from the limited operating periods that would be in place to reduce effects of the Project on spotted owls.

Mitigation Measures for Impact B-32

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program**. (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-5 **Conduct pre-construction surveys and monitoring for breeding birds.** (See full description under discussion for Impact B-5)

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Construction disturbance including the use of helicopters during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort would constitute a significant impact and violate the MBTA, without implementation of the mitigation measures. However, implementation of APMs BIO-4 through BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct pre-construction surveys and monitoring for breeding birds), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce potential impacts to a less-than-significant level **(**Class II**)**.

Special-Status Mammals

The proposed Project area supports a variety of special-status mammal species including several species of bats, small rodents, larger carnivores, and the ringtail. Some of the species have widespread distributions

such as the black-tailed jackrabbit; whereas other species including bats, pocket mice, and the ringtail occur in very limited areas and are often reliant on specific habitat types, such as rocky canyons in riparian areas for the ringtail or caves and other structures for many species of bats.

Impacts to unique mammals would be similar to those described for common wildlife (see Impact B-4). Wide-ranging species such as black-tailed jackrabbit are not likely to be affected by the proposed Project. These species are able to quickly egress an area and the short duration of construction at any single point would not result in adverse impacts to the species; however, other species may be affected by the proposed Project. These are discussed in greater detail below.

Impact B-33: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status bat species.

Pallid bat, Townsend's big-eared bat, western red bat, hoary bat, spotted bat, western mastiff bat, big free-tailed bat, and pocketed free-tailed bat are all California Species of Special Concern that have the potential to occur within the proposed Project. Pallid bat, Townsend's big-eared bat, and western red bat are also FS Sensitive species. Several of these species, most notably the pallid bat, have CNDDB and other records of occurrence within the proposed Project. Five pallid bats were located in artificial "bat houses" under a bridge about 325 yards northwest of Alternative 6 helicopter site 3 near Aliso Canyon. Furthermore, the Western red bat, pallid bat, pocketed free-tailed bat and Western mastiff bat are known to occur within the Puente Hills Landfill Native Habitat Preservation Authority lands. The proposed Project area includes numerous locations that constitute suitable bat foraging and roosting habitat, including rock outcroppings, mine shafts, hollow trees, dense forests, and abandoned water tanks. The steep rocky canyon and dense riparian forest at the West Fork of the San Gabriel River located along the West Fork Cogswell Road provides many opportunities for both foraging and roosting.

The decline of bat populations is often due to roost site disturbance, loss of foraging habitat, and loss of roost sites. Activities that have been documented to impact bats include livestock grazing, vegetation treatments, and water reclamation that could lead to loss of a water source or riparian habitat. Due to their sensitivity to human disturbance, roost protection is vitally important for bats. Roost protection measures may include seasonal use restrictions or physical closures as necessary.

Depending on the species bats may be found in a number of areas along the proposed Project alignment. For example, the Townsend's big-eared bat occurs in a variety of habitats and roosts in the open, hanging from rock walls and ceilings. During spring and summer, females establish maternity colonies in the warm parts of caves, mines, and buildings. Other species utilize large trees to roost in. The proximity of good foraging habitat, which includes the presence of water, appears to be a determining factor in roost selection for many species.

Direct impacts to these species include mortality of individuals during construction activities, permanent loss of habitat due to construction of permanent structures (e.g., new towers or access roads) or other construction activities (removal of roosting habitat at pulling and assembly sites), and temporary disturbance during construction (noise, air turbulence, dust, and ground vibrations from helicopters and construction equipment).

Bats that forage near the ground, such as the pallid bat, would also be subject to crushing or disturbance by vehicles driving at dusk, dawn, or during the night. The construction and use of access roads could also disturb bats. This may be higher in areas such as the West Fork Cogswell Road, Big Tujunga Canyon, or along portions of the Shortcut trail. See Impact B-4 for a complete discussion of the effects of

access roads on wildlife. Construction-related activities, which would generate noise, traffic, dust, and diesel fumes, could result in the direct loss of roosting habitat and subsequent mortality to adult bats or pups if any bats were present in the proposed Project area. Indirect effects could include increased traffic, dust, and human presence in the Project area that could result in bats abandoning their roosts or maternal colonies. For example, Townsend's big-eared bat is known to abandon young when disturbed. Impacts to bats during operation of the proposed Project include disturbance by vehicles and individuals utilizing new or improved access and spur roads, ~~corona noise (see Impact B-41),~~ and the spread of noxious weeds~~, and the potential for collision with transmission lines (see Impact B-34)~~.

The construction and operation of the transmission line would not result in a barrier for, or restrict the range of, special-status bat species. However, the construction activities described above could result in direct impacts to these species. To reduce effects of the proposed Project on bats SCE shall implement a variety of measures designed to avoid roost colonies, limit travel at riparian areas during dusk or early morning, reduce fugitive dust, and provide alternative roost sites if bat roosts are affected by construction activities. Although SCE has committed to implementing APMs BIO-1, BIO-4 and BIO-6, these measures do not provide specific language regarding the protection of bats. Therefore, SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), AQ-1a (Implement Construction Fugitive Dust Control Plan), B-33a (Maternity colony or hibernaculum surveys for roosting bats), B-33b (Provision of substitute roosting bat habitat), and B-33c (Exclude bats prior to demolition of roosts).

Mitigation Measures for Impact B-33

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-33a **Maternity colony or hibernaculum surveys for roosting bats.** SCE shall conduct a pre-activity (e.g., vegetation removal, grading) survey for roosting bats within 200 feet of project activities within 15 days prior to any grading of rocky outcrops or removal of towers or trees (particularly trees 12 inches in diameter or greater at 4.5 feet above grade with loose bark or other cavities).

SCE shall also conduct surveys for roosting bats during the maternity season (1 March to 31 July) ~~prior to any construction activities~~ within 300 feet of project activities. Trees and rocky outcrops shall be surveyed by a qualified bat biologist (i.e., a biologist holding a CDFG collection permit and a Memorandum of Understanding with CDFG allowing the biologist to handle bats). Surveys shall include a minimum of one day and one evening. The resume of the biologist shall be provided to the CPUC, FS, and USACE (as appropriate) for concurrence prior to any Project activities.

If active maternity roosts or hibernacula are found, the rock outcrop or tree occupied by the roost shall be avoided (i.e., not removed) by the Project, if feasible. If avoidance of the maternity roost is not feasible, the bat biologist shall survey (through the use of radio telemetry

or other CDFG/FS/USACE approved methods) for nearby alternative maternity colony sites. If the bat biologist determines in consultation with and with the approval of the CDFG, FS, USACE (as appropriate), and CPUC that there are alternative roost sites used by the maternity colony and young are not present then no further action is required, and it will not be necessary to provide ~~mitigation~~ alternate roosting habitat (i.e., Mitigation Measure B-33b would not apply although Mitigation Measure B-33c would still apply). However, if there are no alternative roosts sites used by the maternity colony, Mitigation Measure B-33b is required. If no active roosts are found, then no further action is required. If active maternity roosts are absent, but a hibernaculum (i.e., a non-maternity roost) is present, then Mitigation Measure B-33b is not necessary, but Mitigation Measure B-33c is required.

B-33b **Provision of substitute roosting bat habitat.** If a maternity roost will be impacted by the Project, and no alternative maternity roosts are in use near the site, substitute roosting habitat for the maternity colony shall be provided on, or in close proximity to, the Project site no less than three months prior to the eviction of the colony. Alternative roost sites will be constructed in accordance with the specific bats requirements in coordination with CDFG and ~~ANF~~the FS. By making the roosting habitat available prior to eviction (Mitigation Measure B-33c), the colony will have a better chance of finding and using the roost. Large concrete walls (e.g., on bridges) on south or southwestern slopes that are retrofitted with slots and cavities are an example of structures that may provide alternative roosting habitat appropriate for maternity colonies. Alternative roost sites must be of comparable size and proximal in location to the impacted colony. The CDFG shall also be notified of any hibernacula or active nurseries within the construction zone.

B-33c **Exclude bats prior to demolition of roosts.** If non-breeding bat hibernacula are found in towers or trees scheduled to be removed or in crevices in rock outcrops within the grading footprint, the individuals shall be safely evicted, under the direction of a qualified bat biologist, by opening the roosting area to allow airflow through the cavity or other means determined appropriate by the bat biologist (e.g., installation of one-way doors). The resume of the bat biologist shall be provided to the CPUC, FS, and USACE (as appropriate) for concurrence prior to any Project activities. In situations requiring one-way doors, a minimum of one week shall pass after doors are installed and temperatures should be sufficiently warm for bats to exit the roost because bats do not typically leave their roost daily during winter months in southern coastal California. This action should allow all bats to leave during the course of one week. Roosts that need to be removed in situations where the use of one-way doors is not necessary in the judgment of the qualified bat biologist shall first be disturbed by various means at the direction of the bat biologist at dusk to allow bats to escape during the darker hours, and the roost tree shall be removed or the grading shall occur the next day (i.e., there shall be no less or more than one night between initial disturbance and the grading or tree removal).

If an active maternity roost is located in an area to be impacted by the Project, and alternative roosting habitat is available, the demolition of the roost site must commence before maternity colonies form (i.e., prior to 1 March) or after young are flying (i.e., after 31 July) using the exclusion techniques described above.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Construction activities associated with Project implementation could substantially reduce active maternity roosts for special-status bat species. If active hibernacula and maternity roosts cannot be avoided, impacts would be significant, without implementation of the mitigation measures. However, implementation of

APMs BIO-1, BIO-4, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), AQ-1a (Implement Construction Fugitive Dust Control Plan), B-33a (Maternity colony or hibernaculum surveys for roosting bats), B-33b (Provision of substitute roosting bat habitat), and B-33c (Exclude bats prior to demolition of roosts) would reduce impacts to a less-than-significant level (Class II).

Impact B-34: The Project ~~would~~ could result in transmission line strikes by special-status bat species.

Special-status and FS Sensitive bat species with the potential to occur in the proposed Project include the pallid bat, Townsend's big-eared bat, western red bat, hoary bat, spotted bat, western mastiff bat, big free-tailed bat, and pocketed free-tailed bat. A potential impact to these species resulting from Project implementation is the direct loss of individuals from fatal strikes with transmission lines. Many studies have quantified bird strikes with transmission lines, but analogous information on bats is very limited (Manville 2005).

The pallid bat and Townsend's big-eared bat generally fly too low while foraging to be impacted by additional transmission lines; the number of fatal strikes for these species is expected to be very low and not significant. In addition, pallid bats primarily forage on the ground for terrestrial insects such as scorpions and beetles. The western mastiff bat, big free-tailed bat, pocketed free-tailed bat, spotted bat, hoary bat, and western red bat all fly high enough to potentially be impacted by additional transmission lines. However, given that most bat species can use echolocation to discriminate objects as small as 0.4 to 0.004 inch in size (Vaughan and Vaughan, 1986), and the size of guard lines and 500-kV or 220-kV transmission lines are typically equal to or greater than 0.5 inch in diameter (SCE 2007), the frequency of transmission line strikes is expected to be extremely low. Therefore, the number of fatal strikes is still expected to be quite low and insufficient to substantially reduce the number of these species.

CEQA Significance Conclusion

Line strikes as a result of Project implementation will not substantially reduce the number of special-status bat species, cause their populations to drop below self-sustaining levels, restrict their range, or threaten to eliminate their populations. Therefore, impacts to special-status bat species resulting from transmission line strikes are less than significant **(**Class III**)**.

Impact B-35: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status mammals.

The Los Angeles pocket mouse, Tehachapi pocket mouse, San Joaquin pocket mouse, Northwestern San Diego pocket mouse, Southern grasshopper mouse, Tulare grasshopper mouse, and San Diego black-tailed jackrabbit are all California Species of Special Concern that have the potential to occur along the proposed Project (the Los Angeles pocket mouse and Tehachapi pocket mouse are also FS Sensitive species). The Los Angeles pocket mouse, Tehachapi pocket mouse, San Joaquin pocket mouse, and Tulare grasshopper mouse could occur within marginal habitat within the proposed Project area, but the proposed Project will not eliminate suitable habitat for these species within their current geographic range (Table 3.4-22). The Northwestern San Diego pocket mouse, Southern grasshopper mouse, and San Diego black-tailed jackrabbit occur within the proposed Project area, and the proposed Project will eliminate suitable habitat for these species. However, the amount of suitable habitat that will be impacted by the Project is small (Table 3.4-22) relative to their geographic range and the availability of suitable habitat for

these species within the San Gabriel Mountains (36,455 acres of coastal sage scrub; 253,302 acres of mixed chaparral; and 11,177 acres of coast live oak woodland in the San Gabriel Mountains; Stephenson and Calcarone 1999), and the Chino and Puente Hills (more than 20,000 acres of coastal sage scrub, California annual grassland, coast live oak woodland, and California walnut woodland; Cooper 2000, LSA 2007). Therefore, Project implementation will not result in a significant loss of suitable habitat for these species.

Direct impacts to special-status mammals are similar to those described for other small, fossorial animals and include mechanical crushing by vehicles and construction equipment, trampling, dust, and loss of habitat. See Impact B-4 for a complete discussion of the impacts of the use and construction of access roads. Construction disturbance can also result in the flushing of small animals from refugia which increases the predation risk for small rodents. Indirect impacts include alteration of soils, such as compaction that could preclude burrowing, and the spread of exotic weeds. Operational impacts include risk of road kill on access and spur roads by the public and maintenance personnel, the spread of noxious weeds, and disturbance due to increased human presence. However, these impacts will not substantially reduce regional populations below self-sustaining levels or restrict the range of these species. SCE indicates that APM BIO-1 and APM BIO-5 would be implemented, which would include preconstruction clearance surveys and the use of biological monitors during construction of the proposed Project. In addition, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would minimize impacts to special-status mammal species.

Table 3.4-22. Estimated Loss of Suitable Habitat for Special-Status Mammals Within the Proposed Project Area

Species	Suitable Habitat	Location of Suitable Habitat	Acres of Suitable Habitat Impacted
Los Angeles pocket mouse	Coastal sage scrub and grassland with fine sandy soils	East of Segments 6 & 11	0
Tehachapi pocket mouse	Joshua tree woodland, pinyon-juniper woodland, oak woodlands, and grasslands in friable, sandy soil	West of Segment 4	0
San Joaquin pocket mouse	Grasslands and desert scrub on fine or sandy soils	West of Segments 4 & 10	0
Northwestern San Diego pocket mouse	Coastal sage scrub and grasslands in moderately gravelly or rocky substrates and sandy-loam to loam soils	Chino Hills of Segment 8	32.2
Southern grasshopper mouse	Grassland and sparse coastal sage scrub habitats	Chino Hills of Segment 8	35.6
Tulare grasshopper mouse	Alkali desert scrub, succulent shrub, arid grassland, and desert wash or riparian communities	West of Segment 10	0
San Diego black-tailed jackrabbit	Open grasslands or sparse coastal scrub	Foothills of San Gabriel Mountains (Segments 6, 7, 11) and Chino and Puente Hills (Segment 8)	51.8

Mitigation Measures for Impact B-35

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

The area of suitable habitat for the Los Angeles pocket mouse, Tehachapi pocket mouse, San Joaquin pocket mouse, Northwestern San Diego pocket mouse, Southern grasshopper mouse, Tulare grasshopper mouse, and San Diego black-tailed jackrabbit potentially impacted by the Project would be quite small relative to the overall population size and range of these species. However, these animals would still be subject to potential mortality from construction activities. Nonetheless Project implementation would not substantially reduce available habitat, restrict the range, or cause regional populations to drop below self-sustaining levels. In addition, the implementation of Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to special-status mammal species to less-than-significant levels (Class II).

Impact B-36: The Project ~~would~~ could result in mortality of San Diego desert woodrats.

The San Diego desert woodrat is a California Species of Special Concern that has the potential to occur along the proposed Project. This species is known from the Puente Hills Landfill Native Habitat Preservation Authority lands. Direct impacts from construction activities ~~would~~ could include the mortality of individual San Diego desert woodrats or disturbance (noise, air turbulence, dust, and ground vibrations from helicopters and construction equipment) to occupied desert woodrat nests. Construction and use of access roads ~~would~~ could also result in impacts to this species. See Impact B-4 for a full discussion of the impacts of access roads on wildlife. The Project would result in the loss of 80.2 acres of suitable habitat for San Diego desert woodrat. Indirect impacts to San Diego desert woodrats include the spread of noxious weeds that would degrade habitat quality and alteration of soils. Operational impacts would include disturbance to woodrat nests, clearing and trimming of vegetation during maintenance activities, the spread of noxious weeds, and disturbance due to use of new or improved access and spur roads by the public and maintenance personnel.

Construction impacts for the San Diego desert woodrat would be within the ANF and Puente and Chino Hills, where this species was frequently captured in recent surveys (LSA 2005). Potential San Diego desert ~~W~~woodrat nests were also frequently observed during reconnaissance surveys in 2007 and 2008 of the proposed Project in the Puente and Chino Hills and portions of the ANF.

The primary mechanism for reducing impacts to this species would be through the identification of nests, avoidance where possible, or through the passive relocation of the animals prior to ground disturbance. To accomplish this SCE shall implement APMs BIO-1 and BIO-4 through BIO-6 which provide for monitoring and pre-construction surveys. While these measures would require surveys for special-status species there is no specific language regarding this species. Therefore to reduce effects of the proposed

Project SCE shall implement Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-36 (Conduct focused surveys for San Diego desert woodrats and passively relocate), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measure for Impact B-36

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-36 **Conduct focused surveys for San Diego desert woodrats and passively relocate.** SCE shall implement pre-construction surveys for the San Diego desert woodrat in suitable habitats ~~within the Chino Hills and Puente Hills~~. If present, active woodrat nests will be flagged and ground-disturbing activities shall be avoided within a minimum of 10 feet surrounding each active nest unless otherwise authorized by the CDFG and CPUC. If avoidance is not possible, SCE will take the following sequential steps: (1) all understory vegetation will be cleared in the area immediately surrounding active nests followed by a period of one night without further disturbance to allow woodrats to vacate the nest, (2) each occupied nest will then be disturbed by a qualified wildlife biologist until all woodrats leave the nest and seek refuge off-site, and (3) the nest sticks shall be removed from the Project site and piled at the base of a nearby hardwood tree (preferably a coast live oak or California walnut). Relocated nests shall not be spaced closer than 100 feet apart, unless a qualified wildlife biologist has determined that a specific habitat can support a higher density of nests. SCE shall document all woodrat nests moved and provide a written report to the CPUC, State Parks (for activities in CHSP associated with Alternative 4), USACE (as appropriate), and CDFG. The resumes of the proposed biologists shall be provided to the CPUC, State Parks, and USACE (as appropriate) for concurrence.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Project implementation would not substantially reduce available habitat or restrict the range of the San Diego desert woodrat. However, construction activities could ~~substantially reduce regional populations~~impact individual nests of this species in the Chino and Puente Hills should they occur at the proposed tower locations. To ensure impacts of the Project are reduced to a less-than-significant level (Class II), SCE will implement APMs BIO-1 and BIO-4 through BIO-6, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-36 (Conduct focused surveys for San Diego desert woodrats and passively relocate), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan).

Impact B-37: The Project ~~would~~ could result in mortality of, and loss of habitat for, the ringtail.

Ringtail, a fully protected species in California, has the potential to occur in chaparral, oak woodlands, bigcone Douglas fir and canyon oak forest, or riparian habitats within canyons of the proposed Project; especially on steeper south or west-facing slopes with oaks or other hardwoods present (Grinnell et al., 1937; Vaughan, 1954; Campbell, 2004). In the San Gabriel Mountains, Vaughan (1954) reported that ringtails occurred in canyons in the chaparral belt. Ringtails are similar to raccoons in that they are often found within 0.6 mile (1 kilometer) of a permanent water source (Zeiner and others, 1990). Ringtails have been observed in Big Tujunga Canyon and near Mt. Gleason (AMEC, 2007) in the vicinity of the Project area. Areas within the proposed Project that contain suitable habitats include Amargosa Creek, Upper Big Tujunga Creek, Santa Anita Canyon, San Gabriel River, Monte Cristo Creek, Mill Creek, Saucer Branch/Millard Canyon, and Tonner Canyon. In addition, many of the small riparian drainages that are crossed by access roads on the ANF support suitable ringtail habitat. The dense riparian forest and adjacent rocky canyons that occur at the West Fork of the San Gabriel River provide excellent habitat for this species. The amount of habitat impacted by the proposed Project will be small (approximately 7.1 acres of riparian and 2 acres of upland habitats along Segments 6, 7, 8, and 11) relative to the home range requirement of a ringtail, which is between 50 and 336 acres (Poglayen-Neuwall and Toweill, 1988). This small loss of habitat spread over four segments will not contribute to a significant loss of habitat for ringtail, and construction and operation of the transmission lines would not physically divide territories or result in a barrier for ringtail. The degradation of riparian areas has been identified by the ANF as a potential threat to the species on NFS lands (Stephenson and Calcarone, 1999). However, the total area of riparian habitat affected by the Project is low and it is not likely to make this species highly vulnerable to adverse effects from land use activities occurring on NFS lands. The most likely cause of disturbance to this species is through the disruption of breeding or loss of denning areas if present.

Direct impacts due to construction activities would include mortality of individual ringtail or disturbance of ringtail maternity dens during the pup-rearing season (1 May to 1 September). The construction and use of access roads in riparian areas could also disturb denning ringtails. See Impact B-4 for a complete discussion of the effects of access roads on wildlife. Dens may be in a hollow tree, a rock pile, a crevice in a cliff, or in abandoned burrows or woodrat nests (Ingles, 1965; Zeiner and others, 1990). Ringtails change dens frequently and an individual rarely spends more than three days in the same shelter. However, females with young remain in the same den for 10 to 20 days after giving birth. After that time dens may be changed daily (Poglayen-Neuwall and Toweill, 1988). Construction noise, dust, human presence, or ground disturbance could result in the abandonment of these nest sites or result in mortality of juvenile animals. Indirect impacts to ringtail could include the spread of noxious weeds that would degrade habitat quality, degradation of water quality due to siltation, and alteration of soils. Operational impacts would include disturbance to ringtail dens, clearing and trimming of vegetation during maintenance activities, the spread of noxious weeds, and disturbance due to use of new or improved access and spur roads by the public and maintenance personnel.

This is a California fully protected species and direct loss of this species is prohibited. Construction activities that occur in areas potentially supporting this species would require the completion of preconstruction surveys to evaluate the potential presence of this species in or adjacent to the proposed work area. If present, work would be redirected to adjacent areas. With the exception of the denning period this species is highly motile and may leave the work area undetected. However, as this species is primarily nocturnal (although this species has been observed during the day in remote canyons) there is some potential to disturb denning or resting animals. To reduce these effects on ringtail SCE would

implement APMs BIO-1, BIO-4, and BIO-6 that provide measures to survey for wildlife and educate workers regarding the sensitivity of wildlife. However, there are no specific measures addressing effects to ringtails. To ensure the Project does not affect this species SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-37 (Conduct focused surveys for ringtail and passively relocate during the non-breeding season), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measure for Impact B-37

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-37 **Conduct focused surveys for ringtail and passively relocate during the non-breeding season.** SCE shall conduct pre-construction ringtail surveys on non-NFS lands at sites with suitable denning habitat within the Project area. This includes at a minimum Amargosa Creek, Santa Anita Canyon, San Gabriel River, and Tonner Canyon within 200 feet of any ground disturbing activity. SCE shall provide a list to the CPUC and State Parks (for activities in CHSP associated with Alternative 4) of the proposed survey areas for approval. Occupied dens will be flagged and ground-disturbing activities within 200 feet will be avoided. If occupied dens are found in the Project area and avoidance is not possible, denning ringtail shall be safely evicted under the direction of a qualified biologist (as determined by a Memorandum of Understanding with CDFG). The qualified biologist shall facilitate the removal of ringtail by delaying construction activity for a minimum 20 days during the early pup-rearing season (1 May to 15 June) and a minimum of 5 days during the rest of the year (16 June to 30 April). If the qualified biologist documents ringtail voluntarily vacating the den site during this period, then construction may begin within 7 days following this observation. If the ringtails do not vacate the den voluntarily within the required period, then the qualified biologist will coordinate with CDFG to passively relocate ringtail (excluding the early pup-rearing season: 1 May to 15 June). All activities that involve the ringtail shall be documented and reported to the CDFG, State Parks (as appropriate), and CPUC within 30 days of the activity.

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits**. (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

The ringtail is a fully protected species and uncommon in southern California. Therefore, the destruction or elimination of active dens during construction activities is considered a significant impact. However, these impacts would be reduced to a less-than-significant level (Class II) with implementation of APMs BIO-1, BIO-4, and BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a

(Prepare and implement a Weed Control Plan), B-37 (Conduct focused surveys for ringtail and passively relocate during the non-breeding season), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Impact B-38: The Project ~~would~~ could result in mortality of American badgers.

American badgers occur in the drier, open habitats with friable soil within the proposed Project, including grassland, desert scrub, Mojave juniper woodland and scrub, Mojave pinyon woodland, Joshua tree woodland, and herb-dominated habitats. Areas within the proposed Project that contain these suitable habitats include the Antelope Valley and Chino and Puente Hills. American badgers have been observed within the Puente Hills Landfill Native Habitat Preservation Authority lands. Foothill sections of the ANF may also support this species. A combined total of approximately 684 acres of these habitats will be impacted along Segments 4, 5, 6, 7, 8, 10 and 11. This loss of potential habitat spread over seven segments will not contribute to a significant loss of habitat for American badger, which has a large home range requirement (338 to 1,549 acres; Ziener et al., 1990) and extensive available, suitable habitat in the West Mojave Desert (5.84 million acres of desert scrub habitat and 62,986 acres of juniper woodland; BLM, 2005) and Puente and Chino Hills (more than 49,000 acres of primarily grassland habitat; Cooper, 2000). This extremely large home range size would allow any individual badger utilizing the Project site to avoid adverse impacts from the associated construction activities or habitat loss. Construction and operation of the transmission lines would not physically divide territories or result in a barrier for this species.

Direct impacts to American badger include mechanical crushing of individuals or burrows by vehicles and construction equipment, noise, dust, and loss of habitat. Indirect impacts include alteration of soils, such as compaction that could preclude burrowing, and the spread of exotic weeds. Operational impacts include risk of road kill on access and spur roads by the public and maintenance personnel, the spread of noxious weeds, and disturbance due to increased human presence. Construction activities including clearing and grading of tower sites, staging areas, and access roads could result in mortality of individual badgers or disturbance of badger maternity dens during the pup-rearing season (15 February to 1 July). See Impact B-4 for a complete discussion of the impacts of access roads on wildlife. Therefore, SCE shall implement APMs BIO-1, BIO-4, BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), B-38 (Conduct focused surveys for American badgers and passively relocate during the non-breeding season), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Mitigation Measure for Impact B-38

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-38 **Conduct focused surveys for American badgers and passively relocate during the non-breeding season.** SCE shall implement pre-construction surveys for American badger within suitable habitat on non-NFS lands. If present, occupied badger dens shall be flagged and

ground-disturbing activities avoided within 50 feet of the occupied den avoided. Maternity dens shall be avoided during pup-rearing season (15 February through 1 July) and a minimum 200-foot buffer established. Buffers may be modified with the concurrence of CDFG and CPUC. Maternity dens shall be flagged for avoidance, identified on construction maps, and a biological monitor shall be present during construction.

If avoidance of a non-maternity den is not feasible, badgers shall be relocated by slowly excavating the burrow (either by hand or mechanized equipment under the direct supervision of the biologist, removing no more that 4 inches at a time) before or after the rearing season (15 February through 1 July). Any relocation of badgers shall occur only after consultation with the CDFG, USACE (as appropriate), State Parks (for activities in CHSP associated with Alternative 4), and CPUC monitor. A written report documenting the badger removal shall be provided to the CDFG, USACE (as appropriate), State Parks (as appropriate), and CPUC within 30 days of relocation.

AQ-1a Implement Construction Fugitive Dust Control Plan. (See full description under Air Quality, Section 3.3)

CEQA Significance Conclusion

Project implementation would not restrict the range of or substantially reduce suitable habitat for American badger, but construction activities that result in the loss of badgers would be considered significant absent mitigation. However, impacts to the American badger would be reduced to a less-than-significant level **(**Class II**)** with the implementation of APMs BIO-1, BIO-4, BIO-5, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), B-38 (Conduct focused surveys for American badger and passively relocate during the non-breeding season), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Effects on federally protected wetlands (Criterion BIO4)

Impact B-39: The Project ~~would~~ could result in the loss of wetland habitats.

Specific construction-related impacts to jurisdictional waters are discussed in detail under Impact B-2 (The Project would result in the loss of desert wash or riparian habitat). SCE has indicated that all areas meeting the regulatory definition of "Waters of the U.S." (jurisdictional waters) and wetlands as defined by Section 404 of the Clean Water Act will be spanned by the high voltage lines and that disturbance, fill, or removal of jurisdictional waters and wetlands will be avoided to the extent practicable. However, the Project ROW crosses numerous drainages that would qualify as jurisdictional waters. While SCE has indicated that the proposed transmission lines would span these areas, many tributaries and drainages are crossed by access roads that could utilize these crossings during periods of water flow. Some of the creeks and drainages that occur in the Project area include Amargosa Creek, Oak Creek, and Cottonwood Creek in the Northern Region; Big Tujunga Creek, the San Gabriel River, and Mill Creek in the Central Region; and the San Gabriel River, the Rio Hondo, and Walnut Creek in the Southern Region. In addition to these and other perennial, ephemeral, and intermittent drainages are numerous other tributaries, unnamed drainages, gullies, and rills that are crossed by the proposed Project. In some areas these crossings would be subject to improvement or grading to ensure the safe passage of vehicles and equipment. This may involve the placement of rock or the construction of culverts. At two locations, SCE has proposed major stream crossing repairs or upgrades. This includes repairing the washed-out Falls

Creek crossing at Big Tujunga, a span of over 200 feet, and major upgrades to the San Gabriel River crossing, an existing damaged concrete Arizona crossing. In addition, the maintenance of existing access roads, which includes grading the road to a minimum of 16 feet in many areas; the construction of new access and spur roads in areas above jurisdictional waters such as Mill Creek, Tujunga Reservoir, and the San Gabriel River; and the installation or replacement of culverts in and adjacent creeks and drainages could result in the discharge of fill into drainages under the jurisdiction of the USACE. Alteration of jurisdictional waters in turn could result in adverse impacts to plant and wildlife species that are dependent on these areas. See Impact B-4 for a complete discussion of the effects of the use and construction of access roads.

Direct impacts to wetland habitats would include the removal of native riparian vegetation, the discharge of fill, degradation of water quality, and increased erosion and sediment transport. Most of these impacts would occur during access road improvements and heavy equipment and vehicle passage where jurisdictional waters traverse access roads. Indirect impacts could include alterations to the existing topographical and hydrological conditions and the introduction of non-native, invasive plant species. Operational impacts to wetland habitats would be similar to indirect impacts and would primarily occur as a result of facilitated use of new or improved spur roads and access roads.

As required by law SCE would comply with the regulations regarding conducting Project activities in water bodies under the jurisdiction of the State and federal government. As such SCE would obtain required permits pursuant to Section 401 and 404 of the CWA and the State Porter-Cologne Act and CDFG Code 1602. On NFS lands SCE would comply with the Forest requirements regarding RCAs. In accordance with the Clean Water Act, there would be no net loss of wetlands from the implementation of the proposed Project. As such, SCE would mitigate permanent and temporary impacts at a minimum 1:1 ratio for riparian vegetation (Mitigation Measure B-1a). Mitigation would include restoration, enhancement, and/or compensation, as appropriate. Biological resources associated with jurisdictional habitats have been discussed in detail and mitigation has been presented to reduce or avoid effects to both plant and wildlife that may occur in these areas. In addition, SCE would implement APM BIO-3 (Obtain a Streambed Alteration Agreement) as well as APMs BIO-1, BIO-2, and BIO-4 through BIO-7, which will reduce impacts to riparian and wetland habitat. However, these measures do not provide for reporting nor do they establish specific actions to reduce the effects of the proposed Project. For these reasons, as well as the value of these resources to wildlife species, SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), B-12 (Implement avoidance and minimization measures for fish and aquatic organisms), and AQ-1a (Implement Construction Fugitive Dust Control Plan). These measures would ensure that impacts from erosion and sedimentation that could occur during tower or road construction upslope of a jurisdictional waterway would be minimized, and would also ensure that SCE obtain all appropriate permits. Where avoidance of impacts is not feasible, SCE shall mitigate through the restoration, enhancement, and/or preservation of existing wetlands.

Mitigation Measures for Impact B-39

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-12 **Implement avoidance and minimization measures for fish and aquatic organisms.** (See full description under discussion for Impact B-12)

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** (See full description under Hydrology, Section 3.8)

CEQA Significance Conclusion

As described above for riparian vegetation (Impact B-2), due to the importance of riparian communities, the ongoing loss of wetland habitat within California, and its suitability to support special-status species, any loss of these habitats associated with the proposed Project is significant. As required by law SCE would comply with the regulations regarding conducting Project activities in water bodies under the jurisdiction of the State and federal government. As such SCE would obtain required permits pursuant to Section 401 and 404 of the CWA and the State Porter-Cologne Act and CDFG Code 1602. On NFS lands SCE would comply with the Forest requirements regarding RCAs. To reduce impacts of the proposed Project to less-than-significant levels (Class II), SCE shall implement Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Interference with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)

In southern California, fragmentation of the landscape has reduced much of the remaining habitat available to native species (Haas, 2000). In addition, recent studies suggest that habitat fragmentation and isolation of natural areas ultimately results in the loss of native species within those communities (Soulé et al., 1988). In the Chino Hills area data indicate that fragmentation of habitat and a reduction in useable wildlife corridors can affect the population dynamics of predators including bobcat, coyote, and mountain lions (Haas, 2000). Likewise, the Puente Hills area supports some of the last remaining wildlife habitat within the urbanized San Gabriel Valley. The amount and distribution of suitable habitat is an essential element to consider for the management of wildlife. In fact, some species require, and are often limited to, unique vegetation types for breeding or foraging.

On NFS lands, some of the management strategies regarding wildlife are to play an important regional role in maintaining large blocks of wildland habitat within one of the most highly urbanized landscapes in the United States. This includes maintaining diverse habitats of native and desired nonnative plant, fish, and animal species and protecting areas that are the only remaining habitat refugia for species imperiled by the loss or degradation of habitat off-forest.

As described in Section 3.4.2.2.4, wildlife corridors provide a variety of functions and can include habitat linkages between natural areas; provide greenbelts and refuge systems; and divert wildlife across permanent physical barriers to dispersal such as highways and dams by roadway underpasses and ramps (Hass, 2000; Simberloff et al., 1992). Generally, the accepted definition describes a wildlife corridor as a linear habitat, embedded in a dissimilar matrix that connects two or more larger blocks of habitat (Beier and Noss, 1998). Noss (1987) also suggests several potential advantages to corridors, including increased species richness and diversity, decreased probability of extinction, maintenance of genetic variation, a greater mix of habitat and successional stages, and alternative refugia from large disturbances.

The proposed Project crosses three geographically important wildlife movement areas including the high desert, the ANF, and the Puente/Chino Hills Corridor area. Each of these areas plays an important role by providing habitat, wild lands, and connectivity to other regions of southern California. Portions of the Antelope Valley act as movement corridors for both common and special-status wildlife from the Tehachapi Mountains to the ANF and Los Padres Forests. The ANF remains one of the largest non-urbanized areas adjacent to Metropolitan Los Angeles with links to regions ranging from the San Bernardino Mountains to the east to the Los Padres Mountains in the west.

Linkages and corridors facilitate regional animal movement and are generally centered around waterways, riparian corridors, flood control channels, contiguous habitat, and upland habitat. Drainages generally serve as movement corridors because wildlife can move easily through these areas, and fresh water is available. Corridors also offer wildlife unobstructed terrain for foraging and for dispersal of young individuals. Ridgelines that occur throughout the Project area may also serve as movement corridors depending on the topography.

With the exception of a short segment in the northern Antelope Valley, the proposed Project would not result in a new barrier to wildlife movement. Currently, the construction of the proposed Project would involve the removal and replacement of an existing line. While the line would be larger and some new access roads would be constructed, new barriers to movement would not be constructed. On both private and federal lands some of the major barriers to movement include highways such as State Route 14, Highway 2, Interstate 210, and the 605 Freeway. Large urban areas in the San Gabriel Valley, agricultural lands, and residential areas occur across the Project alignment. Due to the intermittent locations of construction activity and its temporary nature, wildlife would not be physically prevented from moving around Project equipment in the transmission corridor. During Project operation, the widely spaced towers would not physically obstruct wildlife movement; wildlife could move under and around the towers.

Aquatic Wildlife

The proposed Project would not substantially interfere with the movement of any native resident or migratory fish, reptile, or amphibian species. Native and migratory fish are limited within the proposed Project due to the seasonal nature of the creeks and drainages. However, several special-status fish species including the Santa Ana sucker, unarmored threespine stickleback, arroyo chub, and Santa Ana speckled dace occur in Big Tujunga and the San Gabriel Rivers. These species may also occur in upstream portions of the tributary drainages to these waterbodies during seasonally wet years. Riparian habitat and portions of the streambed would be impacted at Amargosa Creek, Monte Cristo Creek, the San Gabriel River, Upper Big Tujunga Creek, Mill Creek, Aliso Creek, and many other riparian-dominated drainages during the expansion of the existing access roads. While some of these are dry for most of the year and any improvements would be conducted in compliance with State and federal law (CDFG 1602, RWQCB

401/402, USACE 404) and mitigation would be applied for minimizing potential barriers to upstream or downstream movement of fish or wildlife; it is likely that expansion of access roads in some locations would require the temporary diversion of the active stream channel. Activities that involve modification of the bed or bank of a State jurisdictional waterway would be regulated by the CDFG, Regional Board, and USACE. On NFS lands, the FS would have to approve any modification to the stream channel or bed prior to implementation. SCE would implement APM BIO-3 (Obtain a Streambed Alteration Agreement), which would contain conditions for avoiding or minimizing impacts to aquatic species. In addition, SCE would implement Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), and H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits). Implementation of B-2 (Implement RCA Treatment Plan) would likely limit or restrict the use or expansion of some access roads during the breeding season for nesting birds and other wildlife and B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms) would provide measures to protect aquatic species and prevent construction of barriers to movement. These measures would ensure that any activities in riparian areas do not result in an obstruction to wildlife movement.

Terrestrial Wildlife

Ground-disturbing activity, including tower pad preparation and construction, grading of new access roads, tower removal, and use or improvement of existing access roads could interfere with terrestrial wildlife movement during construction. As described for Impact B-4 (Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and result in wildlife mortality), clearing, grading, and helicopter noise would generate the greatest construction impacts on wildlife, especially in undisturbed portions of the ANF. Construction would affect wildlife in adjacent habitats by interfering with movement patterns or cause animals to temporarily avoid areas adjacent to the construction zone. In general, nocturnal (i.e., active at night) wildlife would be affected less by construction than diurnal (i.e., active during the day) species since construction would occur primarily during daylight hours. More mobile species like birds and larger mammals are expected to disperse into adjacent habitat areas during the land clearing and grading phases associated with tower construction.

Construction activities may temporarily limit terrestrial wildlife movement at tower locations; however, the broad geographic range and habitat that occurs in many sections of the proposed Project would remain available to wildlife. Mobile wildlife would be able to respond to construction activities by moving to adjacent habitats, and as many large species move during the evening or early morning when construction activities would be limited, construction would not interfere with their movement. In addition, large sections of the proposed Project located in the Northern Region are located in developing and agricultural communities that do not support large populations of wildlife.

The construction of new transmission towers and the installation of new transmission line cables could interfere with aerial migratory movements of some birds or bats (See Impact B-40 below). However, the modification of habitat would consist of relatively small footprints and would not change the local topography to the extent that movement would be substantially impeded. Alternative movement corridors would also remain intact for the majority of wildlife species that may occur in the proposed Project area. Implementation of measures that require worker training such as Mitigation Measures B-1b (Implement a

Worker Environmental Awareness Program) and Mitigation Measure B-2 (Implement RCA Treatment Plan) would reduce impacts of the proposed Project on wildlife movement.

Impact B-40: The Project ~~would~~ could interfere with established bird and bat migratory corridors.

A potential impact to migrating bird and bat species resulting from Project implementation is the interference with established migratory corridors as a result of fatal collisions with transmission lines. Many studies have quantified bird strikes with transmission lines, but analogous information on bats is very limited (Manville 2005). Land bird migration in California is protracted in time and space, with migration occurring virtually throughout the year and migrants spread over a broad front with few concentration areas. In California, land bird migrants concentrate along the Pacific coast, large rivers, and desert oases; water birds concentrate along the Pacific coast and in coastal estuaries and freshwater and saline wetlands; and diurnal raptors such as hawks concentrate along the Pacific coast and coastal and interior mountain ranges. Although large numbers of migrating raptors occur along the San Gabriel Mountains, these raptors primarily follow ridgelines oriented north/south. There are few such areas in the proposed Project and none with a bottleneck that results in large concentrations of migrants. Specific impacts and mitigation associated with potential bird strikes are discussed in Impact B-21 (The Project would result in collision with overhead wires by State and/or federally protected birds.).

CEQA Significance Conclusion

There are no known bird or bat migratory corridors that would be directly impeded by the proposed Project. Large concentrations of migrants are not known to utilize any portion of the proposed Project (See Appendix B of the *Biological Specialist Report* [Aspen and H.T. Harvey & Associates, 2009~~8~~], Avian Risk Assessment). Further, bats are expected to avoid transmission lines because they can detect objects as small as 0.4 to 0.004 inch in size through echolocation (Vaughan and Vaughan, 1986), and the size of guard lines and transmission lines is typically greater than or equal to 0.5 inch in diameter (SCE, 2007). Therefore, the impact to bird and bat migratory corridors from the proposed Project would be less than significant (Class III).

Impact B-41: Corona noise ~~would~~ could result in disturbance to wildlife.

As discussed in Section ~~2.3.1~~3.10.2 (~~Existing Noise Conditions~~Affected Environment: Noise)~~ of the *Noise Specialist Report* (Aspen, 2008)~~, the most notable noise source in the immediate vicinity of the majority of the proposed route is the corona noise from the existing transmission lines. Corona generates audible noise during operation of transmission lines. The noise is generally characterized as a crackling, hissing, or humming sound and is most noticeable during wet conductor conditions such as rain or fog. Audible noise from transmission lines is often masked by the background noise at locations beyond the edge of the ROW, particularly where the line runs near a source of background noise such as a freeway, creek, or river channel. In addition, wind, OHV use, and highways noise can often be much louder than corona noise, even in relatively undisturbed areas such as the ANF. The amount of corona produced by a transmission line is a function of the voltage of the line, the diameter of the conductor (or bundle of conductors), the elevation of the line above sea level, the condition of the conductor and hardware, and the local weather conditions. This noise increases with the voltage of the line, irregularities on the conductor surface caused either by age or moisture, and wet ambient meteorological conditions, when high humidity, fog, or rain occur.

While a wealth of information related to the effects of anthropogenic noise on wildlife is available in the literature, studies focused on corona noise are extremely limited. The lack of directed research or clear evidence becomes even more evident at the species level. Among the reasons for this lack of information appear to be a deficiency of reliable knowledge on long-term patterns of behaviors and auditory functions in many species as related to transmission lines. For example, Reimers et al. (2000) states that reliable knowledge is lacking on the effects of transmission lines on reindeer ecology due to the lack of long-term monitoring of reindeer migration patterns in relation to existing lines and the fact that nothing is known about hearing in reindeer in relation to transmission line noise. This is likely the case for other common species expected to occur in the vicinity of the proposed transmission line. Subsequent studies on reindeer and corona noise found that reindeer are able to hear corona noise at levels above 250 Hz. By comparison, humans are better able to hear corona noise than reindeer, at least at the lowest frequencies (Flydal, 2003). It is possible that other species follow the same general pattern; however, scientific literature on this subject is limited.

Although the specific effects of corona noise on wildlife are not clearly understood, it has been shown that population-level effects are more substantial when animals are exposed to sounds that repeatedly occur over extended periods of time as compared to noises resulting in one-time acute responses (OSB, 2003). This is likely a result of sustained background noise reducing (masking) the detection and discrimination of communication signals. These signals may be important for mate attraction, social cohesion, predator avoidance, prey detection, navigation, and other basic behaviors. Masking may be one of the most significant effects of a general increase in background noise on most vertebrates (OSB, 2003). For example, reproduction in many frog species is initiated when sexually mature males use vocalizations to advertise their sex, receptiveness, location and species identity (Odendaal et al., 1986 as in AMEC, 2005). Noisy environments can interfere with this communication process, and create problems with respect to detection, discrimination, and localization of appropriate signals (Wollerman, 1998 as in AMEC, 2005).

In some cases, species may adapt to alterations of the environmental soundscape, either through habituation or modifications in behavior. Habituation may occur if a stimulus occurs repeatedly without negative consequence and if the benefits, such as access to food, outweigh the costs of not reacting (OSB, 2003 as in AMEC, 2005). Moen et al. (1982) concluded that deer learned to associate the sound of chainsaws with felled trees, leading to new foraging supplies. Thus, the detrimental consequences of human activities were undermined by the habitual recognition of noise resulting in access to food. Additionally, raptors are known to associate military training exercises with activities that scare prey into the open (Andersen et al., 1986, 1990). Brumm (2004) identified a modification in bird behavior as territorial males demonstrated singing with higher amplitudes to mitigate for masking noise in the natural environment. However, birds forced to sing with higher amplitudes must bear the increased costs of singing.

With the exception of Segments 4 and 9, the transmission line upgrade would result in a substantial increase in ambient noise levels due to increased corona noise along the proposed route. According to noise modeling surveys, corona noise is estimated to increase by amounts in excess of 30 dBA ~~at some locations along the proposed route~~ on Segment 10 due to the lack of existing structures and on other Segments during rainy conditions only. Under more typical fair weather conditions, only Segment 10 will result in an increase exceeding 30 dBA due to the lack of existing structures along the proposed route (CH2M Hill, 2007). It is important to note that these changes are specific to corona noise and would occur within the immediate vicinity of the ROW. At areas beyond the immediate edges of the ROW,

noise signals are subjected to attenuation. Attenuation is the process by which all signal components decline equally in intensity due primarily to spherical spread, the dispersion of signal energy over an expanding sphere during transmission. Aside from decreasing intensities due to simply moving away from the point source of a particular noise, other factors contributing to attenuation effects include atmospheric absorption, scattering, and boundary interference. These factors can be further modified by environmental elements such as topography, foliage, and temperature and humidity gradients (Rabin et. al, 2003).

As the effects of corona noise on wildlife are poorly understood, it is difficult to predict the degree to which the increase in corona noise will impact local wildlife. Animals, especially breeding birds and other wildlife that use sound for communication, would be expected to move away from the line in order to minimize interference with communication. However, because of the availability of habitats in the Project area, this would not be expected to constitute a substantial impact. Corona noise is already present along most of the proposed Project, and while the proposed Project will result in louder corona noise for most segments, wildlife can be expected to have already been exposed and likely habituated to this disturbance.

CEQA Significance Conclusion

As described above the effects of corona noise on wildlife are poorly understood, and it is difficult to predict the degree to which the increase in corona noise will impact local wildlife. In the Project area, animals are already subject to existing corona noise from about <20–51dBA (see Table 3.10-3, of Section 3.10, Noise), and while the proposed Project will result in louder corona noise for most segments (estimated to be at about 22–60 dBA; see Table 3.10-5, of Section 3.10, Noise), wildlife can be expected to have already been exposed and likely habituated to this disturbance. Thus, corona noise from the proposed Project would be less than significant **(**Class III**)**.

Impact B-42: The Project would result in effects to Management Indicator Species.

The ANF NF LRMP (USDA 2005) requires forest scale monitoring of habitat status and trend for select Management Indicator Species (MIS) on the ANF. Detailed information addressing effects to MIS are incorporated by reference and have been included in Appendix F. Table 3.4-23 identifies the impacts to MIS habitats that would occur during implementation of the proposed Project.

Table 3.4-23. Alternative 2 Impacts to Management Indicators and Management Indicator Species for the ANF

Management Indicator (MI)	Management Indicator Species (MIS)	Acres Directly Impacted by Alternative 2
Fragmentation	Mountain lion	272
Healthy Diverse Habitats	Mule deer	272
Aquatic Habitat	Arroyo toad	~~7~~5
Riparian Habitat	Song Sparrow	0.7
Bigcone Douglas fir Forest	Bigcone Douglas fir	7
Coulter Pine Forest	Coulter pine	8
Montane Conifer Forest	California spotted owl	43

Healthy Diverse Habitats (Mule Deer). Mule deer are used by the ANF as an indicator of healthy diverse habitats. Availability of suitable vegetation for fawning, forage, and cover in close proximity to water is the most limiting factor for mule deer. The ANF LRMP (USDA, 2005) considers all habitat types as potentially suitable for mule deer. Therefore, the entire project area is considered suitable habitat for mule deer. Implementation of the proposed Project would impact approximately 272 acres of mule deer habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Forest-wide deer population distribution is stable. The proposed Project would result in a slight decrease in forest-wide habitat (0.04 percent of forest-wide habitat) for deer. This decrease is equivalent to less than one deer home range; therefore, the slight decrease in habitat may lead to a slight decrease in population numbers especially if the population is at carrying capacity. Based on the small amount of the decrease, the Project-level habitat impacts will not decrease the existing stable forest-wide population distribution trend.

Mule deer are known to inhabit the entire forest, consisting of a total of 701,122 acres.

Fragmentation (Mountain lion). Availability of adequate prey base and habitat connectivity between subpopulations has been identified as the limiting factors for mountain lion populations. The Forest LRMP (USDA, 2005) considers all habitat types as potentially suitable for the mountain lion. Therefore, the entire Project area is considered suitable habitat. Implementation of the proposed Project would impact approximately 272 acres of mountain lion habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

Forest-wide mountain lion population distribution is stable. The proposed Project would result in a slight decrease in forest-wide habitat (0.04 percent of forest-wide habitat) for mountain lion. This decrease is equivalent to less than one mountain lion home range; therefore, the slight decrease in habitat is not expected to lead to a decrease in population numbers. Based on the small amount of the decrease, the Project-level habitat impacts will not decrease the existing stable forest-wide population distribution trend.

Mountain lions are known to inhabit the entire forest, consisting of a total of 701,122 acres.

Montane Conifer Forest (California spotted owl). The greatest threat to this species on NFS lands is the loss of habitat and subsequent population loss due to large stand-replacement wildfires. California spotted owls are known to be present within Segments 6 and 11 of the proposed Project where they primarily use Bigcone Douglas Fir-Canyon Oak Forest or Canyon Oak Forest. Acres of suitable habitat are used to assess the effects of the proposed Project and alternatives on California spotted owl habitat. Implementation of the proposed Project would impact approximately 43 acres of California spotted owl habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The proposed Project would result in little impact to the forest-wide habitat (0.03 percent of forest-wide habitat) for California spotted owls. Therefore, the project-level habitat impacts will not alter or contribute to the existing forest-wide population trends for the California spotted owl.

Riparian Habitat (Song Sparrow). The primary threat to song sparrows and other riparian birds is the destruction of riparian habitat and loss of water (USDA, 2005). Acres of suitable habitat are used to assess the effects of the proposed Project and alternatives on song sparrow habitat. Implementation of the proposed Project would impact approximately 0.7 acres of song sparrow habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The proposed Project would result in a slight decrease in forest-wide habitat (0.015 percent of forest-wide habitat) for song sparrow. This decrease is equivalent to 2.2 song sparrow home ranges (Zeiner et al., 1990); therefore, the slight decrease in habitat would not likely lead to a decrease in population numbers. Based on the small decrease in habitat, the Project-level habitat impacts will not modify the existing declining forest-wide population distribution trend.

Aquatic Habitat (Arroyo toad). Acres of suitable aquatic and riparian habitats is used to assess the effects of the proposed Project and alternatives on arroyo toad habitat. Implementation of the proposed Project would impact approximately ~~7~~ 5 acres of FS modeled arroyo toad habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The effects of the proposed Project will result in a small decrease in forest-wide modeled habitat for arroyo toad (0.01~~02~~ percent of the forest-wide modeled habitat). The proposed Project will not alter or contribute to the existing forest-wide habitat or population trend.

Oak Regeneration (Blue oak, Engleman oak, and Valley oak). Blue oak, valley oak, and Engelmann's oaks were not identified in the proposed utility corridor and would not be impacted by Project construction. Oak woodlands occur in the valley bottoms and drainages at several locations along the designated utility corridor for the proposed Project on NFS lands and along portions of the ROW in Haskell Canyon on non-NFS lands; however, these three MIS were not found within these oak woodlands. Therefore, the Project-level habitat impacts will not alter or contribute to the existing forest wide population trends for blue oak, Engleman oak, and valley oak.

Bigcone Douglas-fir Forest (Bigcone Douglas-fir). According to the Forest LRMP (2005), the objective for bigcone Douglas fir on the ANF is to maintain bigcone Douglas fir stands. Acres of bigcone Douglas fir within the Project area will be used to assess the effects of the proposed Project. Implementation of the proposed Project would impact approximately 7 acres of bigcone Douglas fir habitat.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The total area impacted by the proposed Project is relatively small and includes 7 acres of disturbance in bigcone Douglas fir habitat. This represents less than 0.02 percent of the total bigcone Douglas fir habitat on the ANF. Key habitat elements for bigcone Douglas fir will not be modified. The Project-level habitat impacts will not alter or contribute to the existing forest-wide population trends for bigcone Douglas fir.

Coulter Pine Forest (Coulter pine). An altered fire regime (fire severity and/or fire return interval) and drought-related bark beetle mortality are the primary factors affecting the abundance and distribution of Coulter pine. Acres of Coulter pine habitat within the Project area will be used to assess the effects of the proposed Project. Approximately 8 acres of Coulter pine habitat would be impacted by the proposed Project.

Relationship of Project-Level Impacts to Forest Scale Habitat and Population Trends for the Species

The proposed Project would result in little impact to the forest-wide habitat (0.17 percent of forest-wide habitat) for Coulter pine. Therefore, the Project-level habitat impacts will not alter or contribute to the existing forest-wide trends for the Coulter pine.

To reduce effects of the proposed Project on MIS SCE would implement APM BIO-1, APM BIO-2, AMP BIO-3, APM BIO-4, APM BIO-5, APM BIO-6 and APM BIO-7. To further reduce effects of the proposed Project on MIS SCE shall implement Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction routes), B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads), B-5 (Conduct pre-construction surveys and monitoring for breeding birds), B-8b (Conduct biological monitoring), B-9 (Conduct protocol surveys for arroyo toads and

implement avoidance measures in occupied areas), B-30 (Conduct pre- and during construction nest surveys for spotted owl), AQ-1a (Implement Construction Fugitive Dust Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and H-1b (Dry weather construction).

Mitigation Measure for Impact B-42

B-1a **Provide restoration/compensation for impacts to native vegetation communities.** (See full description under discussion for Impact B-1)

B-1b **Implement a Worker Environmental Awareness Program.** (See full description under discussion for Impact B-1)

B-1c **Treat cut tree stumps with Sporax.** (See full description under discussion for Impact B-1)

B-2 **Implement RCA Treatment Plan.** (See full description under discussion for Impact B-2)

B-3a **Prepare and implement a Weed Control Plan.** (See full description under discussion for Impact B-3)

B-3b **Remove weed seed sources from construction routes.** (See full description under discussion for Impact B-3)

B-3c **Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.** (See full description under discussion for Impact B-3)

B-5 **Conduct pre-construction surveys and monitoring for breeding birds.** (See full description under discussion for Impact B-5)

B-8b **Conduct biological monitoring.** (See full description under discussion for Impact B-8)

B-9 **Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas.** (See full description under discussion for Impact B-9)

B-30 **Conduct pre- and during construction nest surveys for spotted owl.** (See full description under discussion for Impact B-29)

AQ-1a **Implement Construction Fugitive Dust Control Plan.** (See full description under Air Quality, Section 3.3)

H-1a **Implement an Erosion Control Plan and demonstrate compliance with water quality permits.** (See full description under Hydrology, Section 3.8).

H-1b **Dry weather construction.** (See full description under Hydrology, Section 3.8).

CEQA Significance Conclusion

Impacts to MIS would occur during construction of the proposed Project and are evaluated in the context of habitat loss. For all MIS in the Project area, loss of habitat occurring from implementation of the proposed Project would be minimal (see Table 3.4-23). However, any loss of habitat would be considered significant without mitigation. To reduce impacts of the proposed Project to less-than-significant levels (Class II), SCE shall implement APM BIO-1, APM BIO-2, AMP BIO-3, APM BIO-4, APM BIO-5, APM BIO-6 and APM BIO-7. To further reduce effects of the proposed Project on MIS SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction routes), B-3c (Remove weed seed

sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads), B-5 (Conduct pre-construction surveys and monitoring for breeding birds), B-8b (Conduct biological monitoring), B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), B-30 (Conduct pre- and during construction nest surveys for spotted owl), AQ-1a (Implement Construction Fugitive Dust Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and H-1b (Dry weather construction).

Conflicts with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances (Criterion BIO6)

The following local and regional policy documents were reviewed for consistency with the proposed Project:

- South Coast Resource Management Plan
- Southern California Association of Governments Regional Comprehensive Plan and Guide
- Los Angeles County Draft Preliminary General Plan
- Hacienda Heights Community Plan
- Rowland Heights Community Plan
- Altadena Community Plan
- City of La Cañada Flintridge General Plan
- City of Rosemead Draft General Plan
- City of Duarte Comprehensive General Plan Preliminary Draft
- City of Pasadena Comprehensive General Plan
- City of Baldwin Park 2020 General Plan
- Comprehensive General Plan of the City of San Gabriel, California
- Puente Hills Landfill Native Habitat Preservation Authority Resource Management Plan
- Rio Hondo Watershed Management Plan
- County of San Bernardino 2007 General Plan
- Land Management Plan: Southern California National Forests
- Antelope Valley Areawide General Plan
- Food and Agricultural Code Division 23: California Desert Native Plants Act
- Lancaster General Plan
- Palmdale Municipal Code

Generally, these policies and ordinances support the preservation, enhancement, and restoration of natural habitats. Detailed descriptions of the relevant biological policies and actions within these documents are presented in Section 3.4.3, above.

Furthermore, as described in Section 3.4.3, a total of six SEAs overlap with the proposed Project: Joshua Tree Woodlands, San Andreas Rift Zone, Santa Clara River, San Gabriel Canyon, Rio Hondo Wildlife Sanctuary, and Puente Hills. Mitigation proposed above for special-status and unique resources would apply to SEAs as well to protect those resources.

The Project, as designed, may require the removal of oak trees and compliance with Section 22.56 of the Los Angeles County Zoning Code (Part 16). This ordinance requires a permit for the removal of any native oak tree greater than 8 inches in diameter (25 inches or greater in circumference) at breast height. Removed oak trees must be replaced at a ratio of 2:1 (using 15-gallon oaks of the same species, or greater, as determined by the hearing officer), maintained for two years, and replaced if mortality occurs. In addition, a permit is required for the removal of any vegetation on terrain with an 8 percent slope or greater (County Zoning Code Section 12.28). As described in Impact B-1 and consistent with the Los Angeles Zoning Code, all native oak trees shall be avoided where possible. Where avoidance is not possible, SCE shall replace or relocate impacted trees, or pay into the Oak Forest Special Fund.

Furthermore, the Project may result in the loss of Joshua trees and juniper trees in the Northern Region. As described in Section 3.4.3, these species receive protection from the Palmdale Native Desert Vegetation Ordinance. Chapter 14.04 of the City of Palmdale Municipal Code requires a desert vegetation preservation plan with minimum preservation standards for removal of vegetation at sites with Joshua trees and other species included in the California Desert Native Plants Act, California Food and Agriculture Code, Division 23. In compliance with these regulations, SCE shall obtain permits from both Los Angeles and Kern counties for the removal of Joshua trees and other native vegetation. If onsite preservation is not feasible, in lieu, fees will fulfill the requirements of these regulations.

Because of the extensive planning involved in Project design, including implementation of APMs BIO 1 through BIO-7, and the mitigation measures described above in Criteria BIO1 through BIO5, the proposed Project is consistent with the local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. Therefore, no impact would occur.

Conflicts with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP (Criterion BIO7)

The Northern Region of the proposed Project is included in the West Mojave Plan Habitat Conservation Plan (WMPHCP):

> The WMPHCP and BLM plan amendment provides a comprehensive strategy to conserve and protect more than 100 listed or special-status wildlife species and their habitats, including the desert tortoise and Mohave ground squirrel. The plan also provides a streamlined program for public agencies and private parties to comply with requirements of the state and federal Endangered Species Acts. In addition to being a multi-agency HCP, it is also an amendment to the 1980 California Desert Conservation Area (CDCA) Plan and includes a final EIS/EIR analyzing the impacts of the plan's provisions.

The WMP was completed in March 2006 but has not been formally adopted. More details related to the WMP can be found in Section 3.4.3.

Through Project design and implementation of APMs BIO-1 through BIO-7 and the mitigation measures described in Criteria BIO1 through BIO5, SCE shall ensure consistency with the conservation goals of the WMPHCP. Therefore, no impact would occur.

3.4.6.2 Cumulative Effects Analysis

A cumulative impact is one which results from the incremental impact of the proposed Project when combined with other past, present, and reasonably foreseeable future actions that occur within the geographic extent of the cumulative impacts analysis.

Geographic Extent

The geographic extent of this cumulative effects analysis contains the same vegetation mapping area and the extent of the regional setting, as described in Section 3.4.2 (Affected Environment). It is important to note that while the regional extent of these habitat types was considered, only a small area surrounding the footprint of the Project (i.e., 500 feet on either side of the transmission line route) was mapped for the purposes of characterizing vegetation capable of supporting special-status plant and wildlife species, as described in Section 3.4.2. The cumulative effects were analyzed within the context of three separate geographic regions: the Northern Region, which includes parts of southern Kern County and northern Los

Angeles County; the Central Region, which encompasses the ANF; and the Southern Region, which begins at the southern border of the ANF and includes lands within southern Los Angeles County and western San Bernardino County.

Expanding our analysis to a regional scale from the localized scale primarily used for vegetation mapping in Section 3.4.2 allows for the consideration of wildlife corridors, the regional extent of vegetation types, and the regional distribution of special-status species. We have expanded our analysis from that conducted within Section 3.4.2 to include biologically distinct geographic formations: the Antelope Valley in the Northern Region; the San Gabriel Mountain Range within the ANF in the Central Region, including the foothill regions adjacent to the Antelope Valley and the Los Angeles Basin; and the Los Angeles Basin, including the Chino/Puente Hills in the Southern Region. This regional geographic scope is appropriate for analyzing cumulative impacts to biological resources because, although impacts of the proposed Project are primarily localized to the limited impact areas, losses of vegetation types or fragmentation of wildlife corridors would combine with similar impacts of other projects beyond these limited impact areas.

Existing Cumulative Conditions

Northern Region

The Northern Region of the proposed Project is located in the Antelope Valley of the western Mojave Desert and extends north from the northern boundary of the ANF to the proposed Windhub substation at Oak Creek Road, approximately 6 miles west of the City of Mojave (see Section 3.4.2 for complete Existing Conditions). Existing cumulative conditions are defined by past and present agricultural, military, and development activities within the Antelope Valley. The Antelope Valley is an internally drained basin bordered by the San Gabriel and Tehachapi Mountains. Near the center of the Antelope Valley, the dry basins, or playas, of Rosamond and Rogers lakes form the dominant natural landscape feature. Surface flows from the mountainous watersheds to the west and south move overland towards Rosamond Lake as sheet flow, or within natural or artificial channels. Historically, much of the area was cultivated with alfalfa and small grain crops before groundwater withdrawals were restricted in the 1950s due to a reduction in aquifer levels. However, extensive areas of undisturbed saltbush scrub (*Atriplex confertifolia* and *Atriplex polycarpa*) and Joshua tree (*Yucca brevifolia*) woodland habitats occur in areas where high soil salinity/alkalinity renders the land unsuitable for agriculture.

Expansion of the cities of Lancaster and Palmdale in the Antelope Valley has resulted in the continued loss of open space and the degradation of riparian and natural areas that historically supported populations of common, unique, or rare species. Riparian, desert wash, and Joshua tree woodland habitats are gradually being displaced by development, wildlife movement corridors have been modified to the extent that the dispersal and movement of wildlife is curtailed or limited, and expanding population centers are degrading the habitat values where urban and wilderness areas interface.

Central Region

The Central Region of the proposed Project consists of the ANF within the San Gabriel Mountains, north of the Los Angeles Basin and south of the Vincent substation near Forest Ridge Road (see Section 3.4.2 for complete Existing Conditions). Existing cumulative conditions in the Central Region are defined by the efforts of management of public lands on the ANF. The Existing Conditions, as they pertain to biological resources, consist of largely undeveloped, natural vegetation with vast, contiguous open space consisting primarily of mixed chaparral vegetation bisected by dirt roads used by OHVs and hikers. Along

these roads and trails, primarily at their intersection with major roads, invasive weed species dominate and are of major concern for management and removal within the ANF. From a biological perspective, present projects within the ANF are characterized by FS activities such as restoration (including fuels reduction and habitat improvement), operation and maintenance of existing features (including Big Tujunga Dam, special use permits issued to private groups, etc.), management of utility lines (power and crude oil lines), management of road use and safety, and maintenance of trails and recreational features. In addition to these projects located across the ANF, the increase in the population density surrounding the ANF (in the Northern and Southern regions) presents additional threats to existing biological conditions. These threats include increased recreational use, increased air pollution and subsequent nitrogen deposition, greater intensities of "edge effects" at the interface between ANF lands and adjacent privately owned lands, and increased road use. As many residents of Lancaster and Palmdale use Highway 59 and Highway 2 as regular commuting routes through the ANF to the Los Angeles Basin, population increases in these communities (see Northern Region, above) are likely to directly contribute to increased cumulative impacts related to motorized vehicle travel through the ANF.

Southern Region

The Southern Region of the proposed Project occurs in the Los Angeles Basin from the San Gabriel Mountains in the north, through the urban areas of the Basin, to the Puente and Chino Hills. Only the foothills of the San Gabriel Mountains, Puente Hills, Chino Hills, and portions of the Montebello Hills remain as native, relatively intact habitat in the Southern Region (see Section 3.4.2 for a complete description of Existing Conditions). Existing cumulative conditions in the Southern Region are defined primarily by the urban/suburban interface within these few remaining natural areas, often protected from development by communities containing remnant native hillsides. In the past, open space areas in the Southern Region have been consistently converted to other land uses to accommodate the increasing population. However, as natural areas have diminished in size to a few large parks, such as the Santa Fe Dam and Recreation Area, Whittier Narrows Dam and Recreation Area, and the Emerald Necklace Corridor, these areas have been protected and comprise the few remaining wildlife corridors and natural areas capable of supporting special-status species.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects within the Project Area are expected to be characteristic of past and ongoing projects. As discussed above, ongoing development is dominated by residential home construction, clustered in and around communities on non-FS lands. This trend in residential development is also representative of reasonably foreseeable future projects supported by the population growth forecasted throughout much of the Project Area. Cumulative projects that are expected to occur in each of the three Regions are described below.

Northern Region

As previously discussed, the North Region is currently undergoing rapid population growth and development, particularly in and surrounding Lancaster and Palmdale. The current growth and expansion in the Antelope Valley described above is also representative of reasonably foreseeable future projects, based upon population forecasts for the region. Furthermore, the impacts to biological resources resulting from the loss, fragmentation, and/or degradation of habitat from past and ongoing projects are likely to continue and increase in the future.

The cumulative impact scenario presents data regarding population growth in Kern and Los Angeles counties. According to this information, the population in Kern County is expected to rise by 113 percent between the years 2000 and 2050. The population in Los Angeles County is expected to rise by varying degrees, depending on the city, with the cities of Lancaster and Palmdale experiencing growth of 117.5 percent and 186.5 percent, respectively. Residential and non-residential development has been necessary to accommodate the increase in population. Proposed and on-going plans demonstrate this growth, and are suitable for analyzing cumulative impacts. Development and urbanization in the Northern Region is expected to continue and increase substantially to accommodate the increasing population. This will continue to adversely affect biological resources, further fragmenting wildlife corridors and contributing to the loss and degradation of habitat capable of supporting special-status species. Some developments will occur directly within or adjacent to riparian areas, desert washes, Joshua tree woodland, or within habitats suitable for special-status species.

This regional cumulative analysis takes into account the future development of the cities of Palmdale and Lancaster, including planned developments proposing to construct 3,715 single-family homes in Palmdale and 9,798 single-family homes in Lancaster and planned developments within Tejon Ranch (23,000 dwelling units in Centennial and 3,450 dwelling units in the Tejon Mountain Village).

The regional context also extends north to the foothills of the Tehachapi Mountains near Oak Creek Road, where several windfarm projects are planned (proposing to provide the capacity to generate 5,587.1 MW wind generated energy). In addition, due to the rapid growth in this region, several large-scale transportation projects are planned, including portions of the California High Speed Rail and portions of the Orangeline High Speed Maglev Project. The Antelope Valley Water Bank Project also proposes to store water on approximately 640 acres near Rosamond Boulevard between 170th Street and 160th Street West. The Bureau of Land Management (BLM) has received more than 40 applications for solar energy projects located in the California Desert Conservation Area (CDCA). Several projects are located in the vicinity of the TWRA and could potentially interconnect with the proposed Project.

Central Region

The currently proposed project types described previously for past and ongoing ANF activities are representative of future ANF projects. Most of these proposed projects are focused on restoration, habitat improvement, and maintenance of existing facilities. As presented in the cumulative scenario, some of the projects that are planned or underway in the ANF include activities to operate and maintain existing features (including Big Tujunga Dam, special use permits issued to private groups, etc.), reduce fuel loads for fire safety, manage utility lines (SCE and crude oil lines), manage road use and safety, and maintain trails and recreational features. These projects demonstrate the FS's commitment to preserve natural resources within the ANF while providing recreational opportunities for the public. Reasonably foreseeable changes to biological resources in the ANF may include improvements to and expansion of existing facilities and infrastructure (including roads), as well as the establishment of additional resources or facilities. Existing wilderness areas in the ANF will continue to be protected from development and expanded if possible (for instance, through the conversion of an Inventoried Roadless Area under consideration for wilderness designation to a designated Wilderness Area). Cumulative impacts such as increasing habitat degradation near roads resulting from noxious weed infestations may intensify.

Southern Region

The Southern Region is predominately urban in nature, with small patches of fragmented natural habitat throughout the majority of the Los Angeles Basin. Only the foothills of the San Gabriel Mountains,

Puente Hills, Chino Hills, and portions of the Montebello Hills remain as native, relatively intact habitat in the Southern Region. This general setting will likely persist into the future. Expected population growth in the Southern Region ranges from about five percent or less (City of Industry, La Cañada Flintridge, San Marino) to more than 90 percent (City of Ontario), between the years 2000 and 2030. Proposed and ongoing plans previously described demonstrate this growth. The most highly urbanized areas cannot physically accommodate lateral growth, and the General Plan for each city prescribes maintaining open space and natural areas capable of supporting biological diversity. The few large housing developments planned are in-fill sites not suitable to special-status species, in most cases. Local future growth is reasonably expected be located within in-fill sites. Remaining native habitat is protected by local ordinances, is likely to be protected, or is likely to be conserved through conservation easements and managed by entities, such as the Puente Hills Landfill Native Habitat Authority.

Reasonably foreseeable cumulative projects in the Southern Region include approximately 6,400 single-family or multi-family units, the construction of five natural gas-fired turbine generators near the City of Industry, and portions of transportation projects such as the California High Speed Rail, and the Orangeline High Speed Maglev Project. These projects continue to threaten native habitats of the Region, as available space for building diminishes. For example, coastal sage scrub habitat, although regionally abundant, has experienced rapid declines in the past decade from increasing development of coastal areas. Similarly, southern California black walnut, once prolific, is now extremely limited in distribution with fragmented populations of these trees forming disjunct, somewhat degraded communities.

Cumulative Impact Analysis

Impacts of the proposed Project would ~~be cumulatively considerable~~contribute to cumulative impacts if they combine with similar impacts of other past, present, or reasonably foreseeable projects. Table 3.4-24, below, identifies which impacts of the proposed Project would be cumulative in nature~~ly considerable~~ and, of those, what the cumulative significance of each impact would be. Impacts that are not cumulative in nature~~ly considerable~~ would not have an incremental effect on the cumulative scenario. Impacts are evaluated with mitigation measures incorporated, where mitigation has been proposed.

In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which

particular action or event contributed those effects. Third, public scoping for this project did not identify any public interest or need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions."

The cumulative effects analysis in this EIR/EIS is also consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part:

> CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decisionmaking. (40 CFR 1508.7)

Past actions in the cumulative analysis area include projects such as commercial, residential, and infrastructure developments in the Northern and Southern Regions and infrastructure, fuels reduction, fire management, and recreational facility development in the Central Region as well as natural events such as fires, floods, and earthquakes. Most of these types of actions are ongoing in the analysis area, and the types of impacts associated with them are evident in current conditions and continue to occur. For these reasons, the analysis of past actions in this section is based on current environmental conditions.

Table 3.4-24. Cumulative Impacts for Biological Resources – Alternative 2

Impact	Cumulatively Considerable?	Cumulative Significance
B-1: Construction activities would result in temporary and permanent losses of native vegetation.	Yes	Class I
B-2: The Project would result in the loss of desert wash or riparian habitat.	Yes	Class I
B-3: The Project would result in the establishment and spread of noxious weeds.	Yes	Class I
B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.	Yes	Class I
B-5: Construction activities conducted during the breeding season would result in the loss of nesting birds or raptors.	Yes	Class I
B-6: The Project would cause the loss of foraging habitat for wildlife.	Yes	Class I
B-7: The Project ~~would~~ could disturb endangered, threatened, or proposed plant species or their habitat.	Yes	Class I
B-8: The Project ~~would~~ could result in the loss of California red-legged frogs and mountain yellow-legged frogs.	Yes	Class I
B-9: The Project would result in the loss of arroyo toads.	Yes	Class I
B-10: The Project ~~would~~ could result in the loss of desert tortoises.	Yes	Class I
B-11: The Project ~~would~~ could result in mortality of desert tortoises as a result of increased predation by common ravens.	No	Class III

Table 3.4-24. Cumulative Impacts for Biological Resources – Alternative 2		
Impact	Cumulatively Considerable?	Cumulative Significance
B-12: The Project ~~would~~ could result in the loss of special-status fish.	Yes	Class I
B-13: The Project ~~would~~ could result in the loss of Critical Habitat for the Santa Ana sucker.	~~Yes~~No	Class III
B-14: The Project ~~would~~ could result in loss of California condors.	Yes	Class I
B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.	Yes	Class I
B-16: The Project would result in the loss of coastal California gnatcatchers.	Yes	Class I
B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.	Yes	Class I
B-18: The Project ~~would~~ could disturb nesting Swainson's hawks.	Yes	Class I
B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.	Yes	Class I
B-20: The Project ~~would~~ could result in electrocution of State and/or federally protected birds.	~~Yes~~No	Class III
B-21: The Project ~~would~~ could result in collision with overhead wires by State and/or federally protected birds.	Yes	Class I
B-22: The Project ~~would~~ could result in disturbance to Mohave ground squirrels.	Yes	Class I
B-23: The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.	Yes	Class I
B-24: The Project ~~would~~ could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.	Yes	Class I
B-25: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.	Yes	Class I
B-26: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, Coast Range newts.	Yes	Class I
B-27: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.	Yes	Class I
B-28: The Project ~~would~~ could disturb wintering mountain plovers.	Yes	Class I
B-29: The Project would result in the loss of occupied burrowing owl habitat.	Yes	Class I
B-30: The Project would result in the loss of occupied California spotted owl habitat.	Yes	Class I
B-31: The Project ~~would~~ could disturb nesting California spotted owls.	~~Yes~~No	Class III
B-32: The Project ~~would~~ could disturb nesting avian "species of special concern."	Yes	Class I
B-33: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status bat species.	Yes	Class I
B-34: The Project ~~would~~ could result in transmission line strikes by special-status bat species.	No	Class III
B-35: The Project ~~would~~ could result in mortality of, and loss of habitat for special-status mammals.	Yes	Class I
B-36: The Project ~~would~~ could result in mortality of San Diego desert woodrats.	Yes	Class I
B-37: The Project ~~would~~ could result in mortality of, and loss of habitat for the ringtail.	Yes	Class I
B-38: The Project ~~would~~ could result in mortality of American badgers.	Yes	Class I
B-39: The Project ~~would~~ could result in the loss of wetland habitats.	Yes	Class I
B-40: The Project ~~would~~ could interfere with established bird and bat migratory corridors.	No	Class III
B-41: Corona noise ~~would~~ could result in disturbance to wildlife.	No	Class III
B-42: The Project would result in effects to Management Indicator Species.	Yes	Class I

As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), any impacts to special-status plant, fish, or wildlife species, or to habitats capable of supporting these species within the Project alignment, is significant and would require mitigation. These Project impacts would also contribute to the cumulative loss of these resources when combined with the effects of past, present, and reasonably foreseeable projects. Mitigation for the loss of special-status species and their habitats is addressed in Section 3.4.6.1. It is important to note that present and future actions within the cumulative analysis area will be required to undergo NEPA and/or CEQA analysis (unless exempt) and, therefore, will incorporate mitigation measures that are likely to be similar to the proposed Project. However, even with mitigation incorporated

these actions are likely to have incremental effects and these effects are evaluated cumulatively in the following analysis.

Cumulative impacts may occur to formerly undetected populations of special-status plant, fish, and wildlife species that are discovered as a result of future surveys. Should special-status species be observed during future Project surveys, mitigation measures provided within Section 3.4.6.1 will minimize impacts to special-status species.

The potential for cumulative~~ly considerable~~ biological resource impacts from the combination of Project impacts and similar impacts of other projects within the geographic scope of this analysis are described below.

- **Construction activities would result in temporary and permanent losses of native vegetation (B-1).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), the Project would result in the temporary and permanent loss of native vegetation in the Northern, Central, and Southern regions. Past and foreseeable future actions in these areas would also result in considerable loss of native vegetation. Foreseeable future actions include numerous infrastructure and residential development projects proposed for the Antelope Valley (Table 3.4-25) and Chino and Puente Hills (Table 3.4-26), as well as fuel treatment and infrastructure projects within the ANF. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of several native vegetation types that are limited in distribution within southern California (see Tables 3.4-17 and 3.4-18). Mitigation measures proposed for this Project for these impacts (B-1a [Provide restoration/compensation for impacts to native vegetation communities], B-1b [Implement a Worker Environmental Awareness Program], B-1c [Treat cut tree stumps with Sporax], H-1a [Implement an Erosion Control Plan and demonstrate compliance with water quality permits], and AQ-1a [Implement Construction Fugitive Dust Control Plan]) would reduce these impacts, but they would still ~~be cumulatively considerable~~contribute to cumulative effects. Therefore, because of the historic and ongoing loss of native vegetation communities region-wide, the impacts to native vegetation have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).

Table 3.4-25. Development Projects Proposed, in Progress, or Recently Completed within the Antelope Valley of Kern and Los Angeles Counties, California

Location and Name of Project	Type of Project	Distance from Proposed Project (mi)	Status	Approximate No. of Acres Impacted
Willow Springs, PdV/Manzana	Wind energy generation	0.1	Proposed	~~6,435~~ 400
Tehachapi to Mojave, Alta Wind Energy Center	Wind energy generation	<3	Proposed	~~32,000~~ 800
North of Mojave, Pine Tree wind development	Wind energy generation	~15	Proposed	~~8,000~~ 240
Antelope Valley, Antelope Transmission Project Segments 1-3	Transmission lines and towers	0	Approved	~51 linear mi
Antelope Valley, Barren Ridge Transmission Project	Transmission lines and towers	0	Proposed	~90 miles
Northern Antelope Valley, El Paso Line 1903 Conversion	Pipeline replacement	0	N/A	6.4 linear mi
South of Willow Springs, Pacific Wind	Wind energy generation	<2	Planning	5,363*
Antelope Valley (near Windhub and Vincent substations), CA high speed rail	Transportation infrastructure	0 to 2.5	Planning	~50 linear mi
Acton, Orangeline High Speed Maglev	Transportation infrastructure	0	Planning	>20 linear mi

Table 3.4-25. Development Projects Proposed, in Progress, or Recently Completed within the Antelope Valley of Kern and Los Angeles Counties, California

Location and Name of Project	Type of Project	Distance from Proposed Project (mi)	Status	Approximate No. of Acres Impacted
Antelope Valley, Antelope Valley Water Bank	Water storage facility	0	Planning	13,440
South of Rosamond, Copa de Oro Planned Community	Residential	0.2	Approved	>600 (1,201 housing units)
Lancaster, various names	Residential, commercial, open space	0.5 to 1.0	Approved	2,303 (~6,500 housing units, schools, open space)
Palmdale, Ritter Ranch Master Planned Community	Residential, commercial, golf course	0	Approved	11,520 (7,200 housing units, 7 schools, 73 acres of commercial development, golf course)
Palmdale, Anaverde Master Planned Community	Residential, commercial, schools	0	Under construction	8,320± (5,200 housing units, retail stores, Olympic-sized swimming pool)
Palmdale, Rancho Vista Development	Residential, commercial, schools, open space	0.5	Proposed	8,800± (5,500 housing units, schools, golf course, shopping areas, parks)
Palmdale, Quail Valley Annexation and Development Plan	Residential, open space	0	Proposed	1,000 (712 housing units and open space)
Palmdale, Joshua Ranch Development	Residential, commercial, schools, open space	0.2	Proposed	794 (746 residential units and equestrian center)
Palmdale, Ritter Ranch Substation	Substation	0.1	Proposed	3
Quartz Hill, various names	Residential, senior housing	~2.5	Planning	270± (96 housing units)
Total				~~98,848~~ 53,853

*Acreage estimate based on the ratio of proposed wind turbines to acres impacted for similar projects in the Antelope Valley.

Table 3.4-26. Residential Development Projects Proposed, in Progress, or Recently Completed within the Chino and Puente Hills

Location (City)	Distance From Proposed Project Area (Mi)	Status	Approximate No. of Housing Units	Approximate No. of Acres Impacted
Eastern Chino Hills (City of Chino Hills)	0	Proposed	1,330	1,552*
Central Puente Hills (Brea)	0	Proposed	3,600	3,000
Southwestern Chino Hills (Brea)	2.5	In progress	658	280
Tonner Hills (Brea)	0.7	Approved but not built	705	789
Tonner Hills (Brea)	2.6	In progress	55	14
Chino Hills (Carbon Canyon)	1.2	Proposed	176	369
Tonner Canyon (Brea)	<1.2	Proposed	400	~467*
Total	—	—	5,594	6,454

*Acreage estimate based on the average ratio of housing units to acres impacted for similar projects in the Chino and Puente Hills.

- **The Project would result in the loss of desert wash or riparian habitat (B-2).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), the Project would result in the temporary disturbance to, and permanent loss of, desert wash and riparian habitat in the Northern, Central, and Southern regions of the Project (see Tables 3.4-17 and 3.4-18). Past and foreseeable future actions in these areas would also result in considerable loss of, or degradation of, desert wash and riparian habitat. Desert wash habitat occurs primarily

within the Northern Region of the proposed Project (Segment 10) and is a limited resource in the Antelope Valley. This resource is also present in the Kentucky Springs Canyon region north of and transitioning into the ANF. Although this unique hydrogeomorphic landform is relatively common in parts of the Antelope Valley, much of this habitat has been lost over the last several decades due to development and agricultural practices, particularly in undeveloped portions of the Project area where off-road vehicle paths and paved roads transect desert washes. Desert wash habitats play an important role in conveying surface flows during the rainfall season to other habitats located down slope that support special-status plants, such as the alkali mariposa lily. Due to its ability to support wildlife and the ongoing loss of riparian habitat statewide, CDFG considers riparian habitat (and desert wash habitat) to be worthy of consideration, both in general and within each of the specific riparian habitat types described in Section 3.4.6.1. SCE has indicated that impacts to most drainages, desert washes, and riparian areas would not occur as these areas would be spanned by the Project. However, considerable riparian habitat would be impacted from the expansion of the existing access roads and creation of spur roads to structures. Any activities that involve modification of the bed or bank of a state or U.S.-jurisdictional waterway would be regulated by the CDFG, Regional Water Quality Control Board (RWQCB), and USACE. On NFS lands no activities can occur within designated Riparian Conservation Areas without approval from the FS. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact would reduce and/or degrade desert wash and riparian habitat types that are limited in distribution within southern California. Mitigation measures proposed for this Project for these impacts (B-1a: Provide restoration/compensation for impacts to native vegetation communities, B-1b: Implement a Worker Environmental Awareness Program, B-2: Implement RCA Treatment Plan, H-1a: Implement an Erosion Control Plan and demonstrate compliance with water quality permits, and AQ-1a: Implement Construction Fugitive Dust Control Plan) would reduce these impacts, but they would still ~~be cumulatively considerable~~contribute to cumulative effects. Therefore, the impacts to desert wash and riparian habitat types has the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project would result in the establishment and spread of noxious weeds (B-3).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), noxious weeds often establish following disturbance and/or water or nutrient addition. In addition, once established, populations of weeds are extremely difficult to eradicate. The spread of existing weeds or the introduction of new weed populations is a significant Project impact and would also contribute to the cumulative spread of weeds when combined with weed population establishment and spread occurring from other past and reasonably foreseeable projects. The habitat degradation resulting from the spread of weeds is significant and any cumulative effects of weed invasion would be significant. Other projects that promote new, or worsen existing, weed invasions are likely to occur concurrent with and in the vicinity of the proposed Project. The spread and establishment of weeds can have direct effects on special-status species as habitat is lost. Mitigation measures imposed on the proposed Project, including B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), and B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads) would reduce cumulative impacts, but not to less-than-significant levels. Therefore, the introduction and spread of noxious weeds by the proposed Project has the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality (B-4)**. As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), the Project would result in disturbance to wildlife and wildlife mortality, including special-status species, during construction activities. Past and foreseeable future actions in these areas would also result in considerable disturbance to wildlife, especially common species. Foreseeable future actions include various infrastructure and residential development projects proposed for the Antelope Valley (Table 3.4-25) and Chino and Puente Hills (Table 3.4-26), and 8,500 acres of fuel management and restoration projects within the ANF. The incremental effect of the proposed Project, when combined with the effects created by other past (as evidenced by current conditions in the study area) and reasonably foreseeable projects, would be potentially adverse and cumulatively considerable. Implementation of APM BIO-1 (pre-construction clearance surveys for wildlife) and Project Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce the Project's

incremental contribution to cumulative effects to wildlife. However, the Project has the potential to combine with ~~similar~~ impacts of other past and reasonably foreseeable future projects, and the cumulative impacts stemming from disturbance to wildlife would be cumulatively significant and unavoidable (Class I).

- **Construction activities conducted during the breeding season would result in the loss of nesting birds or raptors (B-5).** The Project could result in loss of nesting birds, including special-status species, if construction activities were conducted during the breeding season. Past and foreseeable future actions in these areas could also result in considerable loss of nesting birds if construction activities were spatially or temporally combined. Foreseeable future actions include numerous infrastructure and residential development projects proposed for the Antelope Valley (Table 3.4-25) and Chino and Puente Hills (Table 3.4-26), and 8,500 acres of fuel management and restoration projects within the ANF. The incremental effect of the proposed Project, when combined with the effects created by other past (as evidenced by current conditions in the study area) and reasonably foreseeable projects, is significant because the impact substantially reduces the acreage of several habitat types that are important for nesting birds and limited in distribution in southern California, such as riparian habitats. Implementation of APMs and mitigation measures (APM BIO-1: SCE pre-construction clearance surveys for wildlife; APM BIO-8: pre-construction clearance surveys for raptors; and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce the proposed Project's incremental contribution to cumulative impacts. However, construction-related impacts to nesting birds have the potential to combine with similar impacts of past and foreseeable future projects and would be cumulatively significant and unavoidable (Class I).
- **The Project would cause the loss of foraging habitat for wildlife (B-6).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), the Project would result in loss of foraging habitat for wildlife, including special-status species. Past and foreseeable future actions in these areas would also result in considerable loss of foraging habitat. Foreseeable future actions include numerous infrastructure and residential development projects proposed for the Antelope Valley (Table 3.4-25) and Chino and Puente Hills (Table 3.4-26), and 8,500 acres of fuel management and restoration projects within the ANF. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of several habitat types that are important for wildlife and limited in distribution in southern California. Mitigation measures proposed for this Project for these impacts (B-1a [Provide restoration/compensation for impacts to native vegetation communities], B-1b [Implement a Worker Environmental Awareness Program], B-2 [Implement RCA Treatment Plan], B-3a [Prepare and implement a Weed Control Plan], AQ-1a [Implement Construction Fugitive Dust Control Plan], and H-1a [Implement an Erosion Control Plan and demonstrate compliance with water quality permits]) would reduce the proposed Project's incremental contribution to cumulative impacts. However, the impacts to wildlife foraging habitat have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could disturb endangered, threatened, or proposed plant species or their habitat (B-7).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), construction activities could disturb, degrade, or cause permanent loss of habitat for endangered, threatened, or proposed plant species and could also cause loss of endangered, threatened, or proposed plant individuals or populations. Proposed construction locations were surveyed in 2008, and most areas comprised unsuitable habitat for special-status plant species (see Sections 3.4.2, Affected Environment, and 3.4.6, Alternative 2: Impacts and Mitigation Measures). However, some listed plants may occur within the alignment, particularly within the ANF, and thus, Project implementation may result in permanent loss of suitable habitat for these species due to the construction of permanent structures and/or roads and temporary loss of habitat from construction activities. Past actions and natural events (e.g., development, urbanization, recreation, introduced species, fire, drought) have resulted in considerable incremental adverse impacts to State and federally listed plants and their habitats. Foreseeable future actions in this area will also result in considerable adverse impacts to these plants and their habitats. Foreseeable future actions include numerous infrastructure and residential development projects proposed for the Antelope Valley (Table 3.4-25) and Chino and Puente Hills (Table 3.4-26) and fuel treatment and infrastructure projects within the ANF. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable habitat for multiple listed plants in the region. Mitigation measures proposed for this Project such as AQ-1a (Implement Construction Fugitive

Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control PlanPrepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.) would reduce the proposed Project's incremental contribution to cumulative impacts. However, the impacts to endangered, threatened, and proposed plant species or their habitat have the potential to combine with similar impacts of other projects and would be cumulatively significant and unavoidable (Class I).

- **The Project ~~would~~ could result in the loss of California red-legged frog and mountain yellow-legged frog (Impact B-8).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), construction activities within suitable habitat in the Project area may result in "take" of California red-legged frogs and mountain yellow-legged frogs. Take may occur through direct mortality, harassment, entrapment, and/or the loss of habitat due to permanent structures and/or roads. California red-legged frogs may occur within the Amargosa Creek watershed in the vicinity of the Amargosa Creek alignment crossing in the Northern Region. California red-legged frogs and mountain yellow-legged frogs are presumed absent from the Southern Region and may occur within the Central Region, where suitable habitat is present at Lynx Gulch, Alder Creek, Big Tujunga Creek (Segment 6), and West Fork San Gabriel River. Past actions and natural events in the Northern and Central regions (e.g., road construction, development, recreational activities, fire, drought) have resulted in considerable adverse effects to California red-legged frogs and mountain yellow-legged frogs. Foreseeable future actions in the Central Region are limited and are expected to have minimal effects on red-legged and yellow-legged frogs; however, foreseeable future actions that could adversely affect these species in the Northern Region include the Amargosa Creek Improvements Project, which includes road and flood control improvements. Project impacts, should they occur, would contribute substantially to the incremental take of and loss of habitat for these species when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects. These impacts would be cumulatively considerable because the aforementioned past actions and natural events have so severely impacted California red-legged frog and mountain yellow-legged frog populations that both species are now at the brink of extirpation in southern California. Implementation of APMs BIO-1 through BIO-7 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), AQ-1a (Implement Construction Fugitive Dust Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), H-1b (Dry weather construction), B-8a (Conduct protocol surveys for California red-legged frogs and implement avoidance measures), and B-8b (Conduct biological monitoring) would reduce the proposed Project's incremental contribution to cumulative impacts. However, the impacts to California red-legged frog and mountain yellow-legged frog or their habitat have the potential to combine with similar impacts of other projects and would be cumulatively significant and unavoidable (Class I).
- **The Project would result in the loss of arroyo toad (Impact B-9).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), construction activities within suitable habitat in the Project area may result in "take" of arroyo toad. Take may occur through direct mortality, harassment, entrapment, and/or the loss of habitat due to the construction of permanent structures and/or roads. Arroyo toads have the potential to occur in the Central Region of the Project. Past actions and natural events in the Central Region (e.g., road construction, development, recreational activities, fire, drought) have resulted in considerable adverse effects to arroyo toads. Project impacts, should they occur, would contribute substantially to the incremental take of, and loss of habitat for, arroyo toad when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable. APMs BIO-1 through BIO-7 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), H-1b (Dry weather construction), AQ-1a (Implement Construction Fugitive Dust Control Plan), B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), and B-8b (Conduct biological monitoring), which collectively, would mitigate for loss of habitat, require ANF oversight of Project activities in Riparian Conservation Areas, minimize the likelihood of habitat alteration through the proliferation of weeds, and minimize the likelihood of take of individual toads, would reduce cumulative impacts. However, the impacts to arroyo toad have the potential to combine with similar impacts of other projects and would be cumulatively significant and unavoidable (Class I).

- **The Project ~~would~~ could result in the loss of desert tortoise (Impact B-10).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), construction activities within suitable habitat in the Project area may result in "take" of desert tortoise. Take may occur through direct mortality, harassment, entrapment, and/or the loss of habitat due to the construction of permanent structures and/or roads. Desert tortoises have the potential to occur in the northernmost portions of the Northern Region. Past actions and natural events within the Northern Region (e.g., development, urbanization, drought) have resulted in considerable adverse effects to desert tortoises. Foreseeable future actions that could adversely affect desert tortoises in the Northern Region include projects such as the PdV, Alta, and Pine Tree wind farms; El Paso Line 1903 Pipeline Conversion Project; Route 58 Mojave Alignment Project; Hyundai Corporation Test Track Facility and Habitat Conservation Plan; California High-Speed Train System; and at least 12 separate small- and large-scale residential and planned community developments in southern and central Kern County. These projects will result in considerable incremental adverse effects to desert tortoises. Project impacts, should they occur, would contribute substantially to the incremental take of, and loss of habitat for, desert tortoises when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable. Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-10 (Conduct presence or absence surveys for desert tortoise and implement avoidance measures), and AQ-1a (Implement Construction Fugitive Dust Control Plan), which collectively, would mitigate for loss of habitat, minimize the likelihood of habitat alteration through the proliferation of weeds, and minimize the likelihood of take and spread of disease to individual tortoises, and would reduce cumulative impacts. However, the impacts to desert tortoise have the potential to combine with similar impacts of other projects and would be cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could result in mortality of desert tortoises as a result of increased predation by common ravens (Impact B-11).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), the proposed Project would increase the number of transmission towers and substation-associated structures that provide potential nest and perch sites for common ravens (*Corvus corax*), which are known predators of juvenile desert tortoises. Raven population increases appear to be associated with increased perch sites and food supplies made available to ravens via human disposal (e.g., landfills, dumpsters, and litter). Past actions (e.g., development, urbanization, landfill construction, litter, recreation) have resulted in considerable incremental adverse impacts to desert tortoises resulting from common raven predation. Although natural events such as drought and fire have also adversely impacted desert tortoise populations, no natural event has been linked to population increases of common ravens and their predation of desert tortoises. Foreseeable future actions in this area will also result in considerable incremental adverse impacts to desert tortoises resulting from common raven predation. Foreseeable future actions include projects such as the PdV, Alta, and Pine Tree wind farms; Route 58 Mojave Alignment Project; Hyundai Corporation Test Track Facility and Habitat Conservation Plan; California High-Speed Train System; and at least 12 separate small- and large-scale residential and planned community developments in southern and central Kern County. Project impacts, should they occur, would contribute substantially to the incremental predation of desert tortoises by common ravens when combined with the effects of such predation caused by other past and reasonably foreseeable projects. However, none of the aforementioned foreseeable projects would occur in the vicinity of the proposed Project and in known occupied desert tortoise habitat and are, therefore, not cumulatively considerable. Raven population increases, if they occur, are expected to be small, and food supplies are not expected to change appreciably in portions of the Project area where desert tortoises may occur. Therefore, the construction of additional towers and substation-associated structures is not expected to result in a significant increase in cumulative predation of the desert tortoise, if present, by common ravens (Class III).
- **The Project ~~would~~ could result in the loss of special-status fish (B-12).** ~~Project impacts to special status fish are cumulatively considerable.~~ The Santa Ana sucker, arroyo chub, and Santa Ana speckled dace are known to occur in Big Tujunga Creek and the San Gabriel River. Santa Ana suckers occur downstream of the Big Tujunga and Cogswell reservoirs. Project effects to the Big Tujunga population are not expected; however, the Santa Ana sucker is present along the proposed West Fork Cogswell road. While sediment analysis studies indicate there will be no regional effect on water quality from erosion, small localized effects could result in adverse effects to these species. In addition, fuel treatments proposed by the FS for both Mill Creek Summit and Upper Big Tujunga Canyon will directly overlap with Segment 6. These fuel treatments would remove upland vegetation bordering Big Tujunga Creek and could increase stream sedimentation through the deposition of erosional silt adjacent to the creek. Implementation of Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a

Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), H-1b (Dry weather construction), B-8b (Conduct biological monitoring), and B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms) would reduce the cumulative impacts of the Project on special-status fish species. However, the impacts to special-status fish species or their habitat have the potential to combine with similar impacts of other projects and would be cumulatively significant and unavoidable (Class I).

- **Impact B-13: The Project ~~would~~ could result in the loss of Critical Habitat for the Santa Ana sucker (B-13).** Critical habitat for Santa Ana sucker exists downstream of Cogswell Reservoir, in an area that would include an access road for heavy equipment. This access road is paved and runs for approximately 7.4 miles adjacent to the West Fork San Gabriel River. Use of this access road could result in accidental spills, increased turbidity due to vehicles using wet crossings, and potentially alter light regimes from the trimming and/or removal of some riparian vegetation. As described under Impact B-12, vehicle passage through flowing water or leakage onto roadways that is transported into the river during storm events could result in the degradation of habitat.

  Direct loss of critical habitat for this species would not occur from the proposed Project. However, degradation of critical habitat may occur from the accidental release of mud, petroleum products, heavy metals, or other construction materials. However, through the implementation of project minimization measures described under Impact B-12 these effects would be minimized or avoided. With the implementation of these measures the project would not appreciably diminish the value of the habitat or affect the constituent elements required for occupancy by this species. Operational effects would not occur because once the Project has been completed use of the West Fork Cogswell road would not occur. Mitigation measures include Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms). ~~However, the impacts to critical habitat for the Santa Ana sucker have the potential to combine with similar impacts of other projects and would be cumulatively significant and unavoidable.~~ Because Project mitigation and BMPs would minimize or eliminate effects to critical habitat for the Santa Ana sucker, the Project's incremental contribution would be negligible. In addition, other projects that would have the potential to impact Santa Ana sucker critical habitat in the Project area would be required to be mitigated similar to the proposed Project as they would occur on federal lands under the jurisdiction of the FS. Therefore, cumulative impacts to Santa Ana sucker critical habitat would be less than significant (Class III).

- **The Project ~~would~~ could result in the loss of California condor (B-14).** Project-related construction activities could result in impacts to California condors, if present. Past and foreseeable future actions in these areas could also result in impacts to California condors if present. Foreseeable future actions include numerous infrastructure and residential development projects proposed for the Antelope Valley (Table 3.4-25) and Chino and Puente Hills (Table 3.4-26), and 8,500 acres of fuel management and restoration projects within the ANF. While restoration projects on the ANF may increase potential foraging habitat for this species, on a regional scale, loss of habitat continues to occur. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities have the potential to impact and result in the loss of California condors. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-8b (Conduct biological monitoring), and B-14 (Monitor construction in condor habitat and remove trash and micro-trash from the work area daily) would reduce these cumulative impacts. However, construction-related impacts to California condors have the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat (B-15).** Impacts to least Bell's vireos are cumulatively considerable within the Whittier Narrows and Rio Hondo portions of the proposed Project. A storage facility expansion project is planned for the city of Irwindale, adjacent to the Project near the Rio Hondo. The combined effect of this commercial project, other past projects, and the proposed Project would be significant, because their impact increases the level of disturbance to least Bell's vireos within the Rio Hondo. Disturbance to southwestern

willow flycatchers and yellow-billed cuckoos, if present, would also occur in riparian areas of the proposed Project. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), B-15 (Conduct protocol surveys for listed riparian birds and avoid occupied habitat), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts. However, the impacts to least Bell's vireos and other listed riparian birds have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project would result in the loss of coastal California gnatcatchers (B-16).** Impacts to coastal California gnatcatchers are cumulatively considerable within the Puente and Chino Hills portion of the proposed Project. There are six residential development projects proposed or in progress within the Chino and Puente Hills, between 0 and 2.6 miles from the proposed Project (Table 3.4-26). These projects include large community developments in areas that are currently undeveloped, including 4,902 acres of grasslands, coastal scrub, and woodlands. These collective projects would result in the loss of suitable coastal sage scrub habitat for the coastal California gnatcatcher. Continued loss and fragmentation of suitable coastal sage scrub habitat in the Chino and Puente Hills from ongoing development will contribute to the regional decline of this species. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the combined impacts substantially reduce the acreage of suitable habitat in the region. Further, disturbance to California gnatcatchers due to construction activities for this and other cumulative projects would be significant. Implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1b (Implement a Worker Environmental Awareness Program), B-16 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts. However, the impacts to coastal California gnatcatchers have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatchers (B-17).** The FWS designated two areas along Segment 7 (Montebello Hills and Whittier Narrows Recreation Area) and several portions along Segment 8A in the Montebello, Puente, and Chino Hills as critical habitat for the coastal California gnatcatcher (both within Critical Habitat Unit 9). Construction activities, including the installation of permanent structures and/or roads, would result in the loss of an estimated 2.4 acres of critical habitat on Segment 7 and ~~42.6~~44.8 acres on Segment 8. As mentioned above, there are six residential development projects proposed or in progress within the Puente and Chino Hills, between 0 and 2.6 miles from the proposed Project (Table 3.4-26). Some of these areas may be adjacent to or within designated critical habitat and/or occupied habitat for the coastal California gnatcatcher. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact may considerably reduce the acreage of critical or occupied habitat in the region. Implementation of APMs BIO-2 and BIO-4 through BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-16 and B-17 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures, Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts. However, the impacts to coastal California gnatcatcher habitat have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I)
- **The Project ~~would~~ could disturb nesting Swainson's hawks (B-18).** Impacts to nesting Swainson's hawks are cumulatively considerable within the Northern Region of the Project. The Antelope Valley is anticipated to grow substantially in the coming decades, and the cities of Lancaster and Palmdale are expected to increase by more than 308,000 people in the next 25 years. Included in these projects are three large-scale planned community developments, totaling 2,303 acres, located within 1.5 miles from the proposed Project at the existing Antelope Substation. Another sizeable project with potential to disturb nesting Swainson's hawks is the Antelope Valley Water Bank Project, a 640-acre facility to store and distribute surface water located adjacent to the proposed Whirlwind Substation. The incremental effect of the proposed Project, when combined with the effects of other past and reasonably foreseeable projects, would be significant because the combined impact would increase the potential for disturbance to nesting Swainson's hawks. Implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1b (Implement a Worker Environmental

Awareness Program), B-18a and B-18b (Conduct pre-construction surveys for Swainson's hawks, Removal of nest trees for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts. However, the impacts of the proposed Project to nesting Swainson's hawks have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project would result in the loss of foraging habitat for Swainson's hawks (B-19)**. Impacts to foraging habitat for Swainson's hawks are cumulatively considerable within the Northern Region of the Project. Three large-scale planned community developments, totaling 2,303 acres, will be located within 1.5 miles from the proposed Project at the existing Antelope Substation. Another sizeable project with potential to remove foraging habitat for Swainson's hawks is the Antelope Valley Water Bank Project, a 640-acre facility to store and distribute surface water located adjacent to the proposed Whirlwind Substation. The incremental effect of the proposed Project, when combined with the effects of other past and reasonably foreseeable projects, would be significant because the combined impact could substantially reduce the acreage of suitable foraging habitat in the region. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-18a (Conduct pre-construction surveys for Swainson's hawks), B-19 (Compensate for loss of foraging habitat for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts. However, the impacts of the proposed Project to Swainson's hawk foraging habitat have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could result in electrocution of State and/or federally protected birds (B-20)**. The likelihood of electrocutions occurring on transmission lines of voltages greater than 69 kV is low (APLIC, 2006). Although ~~Impacts to State and federally protected birds as a result of electrocution from transmission lines are potentially cumulatively considerable within the Northern Region, where~~ approximately 17 miles of transmission lines proposed in the Antelope Transmission Project Segment 2 would come within close proximity (>0.5 miles) to Segments 10 and 5 of the Project in the Northern Region, the likelihood of electrocution on this line is also low because it will be a 500-kV line. ~~In addition, the continued development of the Region will likely require an expansion of small distribution lines to support both residential and industrial development. The majority of electrocutions are caused by lines that are energized at voltage levels less than 69 kV, and l~~Large, aerial-perching birds such as hawks and eagles are most susceptible to electrocution from ~~these~~ power lines, however the elements of a 500-kV or 220-kV line are spaced far enough apart that even the largest raptors are unlikely to be electrocuted. However, ~~T~~to further reduce ~~such~~ the potential for mortality events, SCE will implement APMs BIO-4 and BIO-9 as part of the proposed Project (in accordance with the *Suggested Practices for Raptor Protection on Power Lines* and *Avian Protection Plan Guidelines*). ~~However, because of the long duration of the construction phase of the proposed Project, APLIC may update the guidelines during this time frame. Therefore, SCE shall use the most recent APLIC guidelines for protection of raptors on power lines~~ The cumulative impacts of electrocution by transmission lines on State and federally protected birds resulting from the Project and other past, present, and reasonably foreseeable projects will be less than cumulatively significant ~~and unavoidable~~ (Class III).
- **The Project ~~would~~ could result in collision with overhead wires by State and/or federally protected birds (B-21)**. Impacts to State and federally protected birds as a result of transmission line strikes are potentially cumulatively considerable within the Northern Region, where approximately 17 miles of transmission lines proposed in the Antelope Transmission Project Segment 2 would come within close proximity (>0.5 miles) to Segment 5 of the Project. Passerines and waterfowl are known to collide with wires particularly during nocturnal migrations or poor weather conditions (Avery et al., 1978). However, passerines and waterfowl have a lower potential for collisions than larger birds, such as raptors. Some behavioral factors contribute to a lower collision mortality rate for these birds. Passerines and waterfowl tend to fly under power lines, as opposed to larger species, which generally fly over the lines and risk colliding with the higher static lines, and many smaller birds tend to reduce their flight activity during poor weather conditions (Avery et al., 1978). Collision mortality would also be higher where the movements of susceptible species are the greatest such as along waterways or over riparian areas. Collision rates generally increase in low light conditions, during inclement weather, such as rain or snow, during strong winds, and during panic flushes when birds are startled by a disturbance or are fleeing from danger. Collisions are more probable near wetlands, valleys that are bisected by power lines, and within narrow passes where power lines run perpendicular to flight paths. Collision impacts from the proposed Project are not expected to result in significant impacts to birds in the Project area due to the implementation of APM BIO-9 as part of the proposed Project in accordance with the guidance on raptor protection found in Suggested Practices for

Raptor Protection on Power Lines (APLIC 2006), and the incorporation of raptor safety protection into the project design (i.e. tower/conductor (lines) on NFS lands. However, as the flight paths become more constrictive and larger numbers of transmission lines, towers, structures, and vehicles occur in the region the numbers of birds subject to collision will continue to rise. When combined with impacts from past, present, or reasonable future projects, these impacts would be considered cumulatively significant and unavoidable (Class I).

- **The Project ~~would~~ could result in disturbance to Mohave ground squirrels (B-22).** Impacts to Mohave ground squirrels are cumulatively considerable within the Antelope Valley portion of the proposed Project. The Antelope Valley is anticipated to grow substantially in the coming decades, and the cities of Lancaster and Palmdale are expected to increase by more than 308,000 people in the next 25 years. There are at least 16 projects comprising wind energy, electrical transmission, power plant, transportation, water, and residential housing that are proposed, planned, or in progress within the Antelope Valley (Table 3.4-25). Included in these projects are two wind energy developments located within 0.1 to 3 miles from the proposed Project in Kern County with a combined impact of 38,435 acres. Another sizeable project is the Antelope Valley Water Bank Project, a 640-acre facility to store and distribute surface water located near the county line separating Los Angeles and Kern counties. Several residential construction projects are proposed or in progress near Lancaster (Table 3.4-25). Collectively, these projects would result in the loss of more than 98,808 acres in the Antelope Valley and a significant cumulative loss of more than 65,858 acres of suitable habitat for Mohave ground squirrel.

  Continued loss and fragmentation of suitable habitat in the Antelope Valley will continue to contribute to the decline of this species within the region. The incremental effect of the proposed Project on Mohave ground squirrels (if present), when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the combined impact substantially reduces the acreage of suitable habitat in the region. Implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-22a (Conduct protocol surveys for Mohave ground squirrels), B-22b (Implement construction monitoring for Mohave ground squirrels), and B-22c (Preserve off-site habitat for the Mohave ground squirrel) would reduce these impacts. However, the impacts of the proposed Project to Mohave ground squirrels (if present) have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species (B-23).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), construction activities will most likely ~~could~~ disturb, degrade, or cause permanent loss of habitat for candidate, FS Sensitive, or special-status plant species in the proposed Project area, and could also cause loss of rare individuals or populations. Proposed tower construction locations were surveyed in 2008, and most areas comprised unsuitable habitat for special-status plant species (see Sections 3.4.2, Affected Environment, and 3.4.6, Alternative 2: SCE's Proposed Project). Some special-status plants are known to occur within the alignment, particularly within the ANF, and Project implementation would thus result in permanent loss of suitable habitat for these species due to installation of permanent structures and/or roads and temporary loss of habitat from construction activities. Past actions and natural events (e.g., development, urbanization, recreation, fire, drought) have resulted in considerable incremental adverse impacts to special-status plants and their habitats. Foreseeable future actions in this area will also result in considerable adverse impacts to special-status plants and their habitats. Foreseeable future actions include numerous infrastructure and residential development projects proposed for the Antelope Valley (Table 3.4-25) and Chino and Puente Hills (Table 3.4-26), and fuel treatment and infrastructure projects within the ANF. The incremental effects of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, are significant because the impact substantially reduces the acreage of suitable habitat for candidate, FS Sensitive, and special-status plant in the region. Mitigation measures proposed for Impact B-23, such as B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.), B-23 (Preserve offsite habitat/management of existing populations of special-status plants), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts. However, the impacts to special-status plants have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project ~~would~~ could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles (B-24).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), construction activities may result in mortality or injury of individual southwestern pond turtles within suitable habitat at the following locations: Amargosa Creek, Lynx Gulch, San Gabriel River (Segment 6 and 7), Big Tujunga Creek, Rio Hondo, Brea Canyon, and Tonner Creek. Furthermore, Project implementation may result in permanent loss of nesting habitat in limited areas due to construction of permanent structures and/or roads and temporary loss of habitat from construction activities. Past actions and natural events (e.g., development, urbanization, recreation, fire, drought) have resulted in considerable incremental adverse impacts to southwestern pond turtles and their nesting habitat. Foreseeable future actions in this area will also result in considerable adverse impacts to southwestern pond turtles and their nesting habitat. Foreseeable future actions include projects such as the Amargosa Creek Improvements Project; Corridor Management Plan - Angeles Crest Scenic Byway, CA State Route 2 Enhancement; and California High Speed Train System and Maglev. Numerous small- and large-scale residential and planned community developments are also planned within the geographic extent. Project impacts, should they occur, would contribute substantially to the incremental mortality, injury, and loss of nesting habitat for southwestern pond turtles when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable. Implementation of APMs BIO-1 through BIO-3 and BIO-5 through BIO-7 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), B-24 (Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), H-1b (Dry weather construction), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce cumulative impacts. However, the impacts to southwestern pond turtles have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes (B-25).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), construction activities may result in mortality or injury of individual two-striped garter snakes and south coast garter snakes within suitable habitat in the Project area. Furthermore, Project implementation may result in loss of habitat due to the construction of permanent structures and/or roads and temporary loss of habitat from construction activities. Past actions and natural events (e.g., development, urbanization, recreation, fire, drought) within the geographic extent have resulted in considerable incremental injury or mortality of, and loss of habitat for, these species. Foreseeable future actions in this area will also result in considerable impacts of this kind to these species. Foreseeable future actions include projects such as the Amargosa Creek Improvements Project; Corridor Management Plan - Angeles Crest Scenic Byway, CA State Route 2 Enhancement; and California High Speed Train System and Maglev. Numerous small- and large-scale residential and planned community developments are also planned within the geographic extent. Project impacts, should they occur, would contribute substantially to the incremental injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable. Implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure, B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), B-25 (Conduct focused surveys for two-striped garter snake and south coast garter snake and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce cumulative impacts. However, the impacts to two-striped garter snakes and south coast garter snakes have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, Coast Range newts (B-26).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), construction activities occurring within one mile of suitable habitat or vehicular crossings at wet fords across occupied drainages have the potential to result in mortality or injury to Coast Range newts. Furthermore, Project implementation may result in permanent loss of habitat due to the construction of permanent structures and/or roads and temporary loss of habitat due to disturbance from construction activities. Past actions and natural events (e.g.,

development, urbanization, recreation, fire, drought) have resulted in considerable incremental adverse effects to Coast Range newts, particularly in the San Gabriel Valley, where effects of development and urbanization have been most intense. However, foreseeable future actions in this region are limited and are expected to have minimal effects on this species. Primarily as a result of considerable past effects, Project impacts, should they occur, would contribute substantially to the incremental injury or mortality of, and loss of habitat for, Coast Range newts when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable. Implementation of the APMs (BIO-1 through BIO-7), Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-26 (Conduct focused surveys for coast range newt and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce cumulative impacts. However, the impacts to coast range newts have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species (B-27).** As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), Project-related construction activities could result in injury or mortality of 11 terrestrial California Species of Special Concern and FS Sensitive amphibian and reptile species (the special-status terrestrial herpetofauna). Furthermore, Project implementation may result in permanent loss of habitat due to the construction of permanent structures and/or roads and temporary loss of habitat from construction activities such as preparation and use of staging areas. Individuals of one or more of the special-status terrestrial herpetofauna could be injured or killed during ground-disturbing Project activities in undeveloped upland habitats and in some developed areas throughout the proposed Project. Past actions and natural events (e.g., development, urbanization, recreation, fire, drought) within the geographic extent have resulted in considerable incremental injury or mortality of, and loss of habitat for, these species. Foreseeable future actions throughout the region will also result in considerable impacts of this kind to these species. Foreseeable future actions include projects such as the PdV, Alta, and Pine Tree wind farms; El Paso Line 1903 Pipeline Conversion Project; Route 58 Mojave Alignment Project; Hyundai Corporation Test Track Facility and Habitat Conservation Plan; California High-Speed Train System; Amargosa Creek Improvements Project; Corridor Management Plan - Angeles Crest Scenic Byway, CA State Route 2 Enhancement; 465 residence recreation permit issuances on 18 tracts within the ANF, California High Speed Train System and Maglev; and numerous small- and large-scale residential and planned community developments. Project impacts, should they occur, would contribute substantially to the incremental injury or mortality of, and loss of habitat for, the special-status terrestrial herpetofauna when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable. Implementation of APMs BIO-1 through BIO-7 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-27 (Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce cumulative impacts. However, the impacts to special-status terrestrial herpetofauna have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could disturb wintering mountain plovers (B-28).** Impacts to ~~nesting~~ wintering mountain plovers are cumulatively considerable within the Northern Region of the Project. Three large-scale planned community developments, totaling 2,303 acres, are planned within 1.5 miles from the proposed Project at the existing Antelope Substation. Another sizeable project with potential to disturb wintering mountain plovers is the Antelope Valley Water Bank Project, a 640-acre facility to store and distribute surface water located adjacent to the proposed Whirlwind Substation. The incremental effect of the proposed Project, when combined with the effects of other past and reasonably foreseeable projects, would be significant, because the combined impact substantially reduces the total amount of suitable wintering habitat in the region. Therefore, the impacts of the proposed Project to wintering mountain plovers have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project would result in the loss of occupied burrowing owl habitat (B-29).** Impacts to occupied burrowing owl habitat are cumulatively considerable within the Northern Region of the Project. Three large-

scale planned community developments, totaling 2,303 acres, are planned for a location near the existing Antelope Substation, within 1.5 miles from the Project. Two other sizeable projects with the potential to reduce occupied burrowing owl habitat in the Northern Region are the 6,400-acre PdV Wind Energy facility planned for a location just east of Segment 10 and the 640-acre Antelope Valley Water Bank facility to be located adjacent to the proposed Whirlwind Substation. Impacts to occupied burrowing owl habitat are also cumulatively considerable within the Southern Region of the Project, where 6,454 acres will be developed in the Chino and Puente Hills near Segment 8. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities would result in loss of suitable and possibly occupied burrowing owl habitat in the Northern and Southern regions of the Project. Implementation of APMs BIO-2 and BIO-4 through BIO-8 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-29 (Implement CDFG protocol for burrowing owls), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these cumulative impacts. However, construction-related impacts to occupied burrowing owl habitat have the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project would result in the loss of occupied California spotted owl habitat (B-30).** Impacts to occupied California spotted owl habitat are cumulatively considerable in Upper Big Tujunga Creek and Mill Creek. Fuel treatments are proposed by the FS for both Mill Creek Summit and Upper Big Tujunga Canyon, and both of these areas directly overlap with Segment 6. Fuel treatments at these sites will substantially reduce the amount of tree cover around FS Administrative Sites within the ANF. These include the treatment of forest habitats at Mill Creek Station (Mill Creek Summit along Angeles Crest Highway) and at Shortcut Station in Upper Big Tujunga Canyon (0.6 miles east-northeast of the intersection of Angeles Crest Highway and Upper Big Tujunga Canyon Road). The incremental effect of the Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities would result in loss of suitable and possibly occupied California spotted owl habitat in the Central Region of the Project. Implementation of APMs BIO-2 and BIO-4 through BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-30 (Conduct pre- and during construction nest surveys for spotted owl), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these cumulative impacts. However, construction-related impacts to occupied California spotted owl habitat have the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could disturb nesting California spotted owls (B-31).** ~~Impacts to nesting California spotted owls are cumulatively considerable in Upper Big Tujunga Creek and Mill Creek.~~ As noted above in cumulative impacts for B-30, fuel treatments are proposed by the FS for both Mill Creek Summit and Upper Big Tujunga Canyon, and both of these areas directly overlap with Segment 6. Fuel treatments at these sites will ~~substantially~~ reduce the amount of tree cover and create considerable noise of short duration adjacent to Segment 6. However, these projects would be subject to the same requirements as the proposed Project with regard to California spotted owls, and would be mitigated similarly to the proposed Project. The ~~incremental effect of the~~ Project~~, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because~~ construction activities could potentially result in disturbance of nesting California spotted owls in the Central Region of the Project. However, ~~I~~implementation of APMs BIO-2 and BIO-4 through BIO-6 and Mitigation Measures B-1b (Implement a Worker Environmental Awareness Program), B-30 (Conduct pre- and during construction nest surveys for spotted owl), and AQ-1a (Implement Construction Fugitive Dust Control Plan), would reduce these ~~cumulative~~ impacts. ~~However, construction-related disturbance to nesting California spotted owls has the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable~~Therefore, cumulative impacts of the proposed Project to nesting California spotted owls would be less than significant (Class III).
- **The Project ~~would~~ could disturb nesting avian "species of special concern" (B-32).** The Project would result in the loss of nesting avian Species of Special Concern if construction activities were conducted during the breeding season. Past and foreseeable future actions in these areas would also result in considerable loss of nesting birds if construction activities were spatially or temporally combined. Foreseeable future actions include numerous infrastructure and residential development projects proposed for the Antelope Valley (Table 3.4-25) and Chino and Puente Hills (Table 3.4-26), and 8,500 acres of fuel management and restoration projects within the ANF. The incremental effect of the proposed Project, when combined with the effects

created by other past and reasonably foreseeable projects, would be significant, because construction activities would take place within or adjacent to habitats that are important for nesting avian Species of Special Concern in southern California. Implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these cumulative impacts. However, construction-related impacts to nesting avian Species of Special Concern have the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project ~~would~~ could result in the mortality of, and loss of habitat for, special-status bat species (B-33).** Impacts to pallid bat, western red bat, hoary bat, spotted bat, western mastiff bat, and pocketed free-tailed bat are cumulatively considerable within the ANF and the Puente and Chino Hills portion of the proposed Project. There are six residential development projects proposed or in progress within the Chino and Puente Hills, between 0 and 2.6 miles from the proposed Project (Table 3.4-26). These projects include large community developments, including 4,902 acres of habitat for these special-status species. These collective projects would result in the loss of suitable roosting habitat for pallid bat, western red bat, hoary bat, spotted bat, and western mastiff bat. Continued loss and fragmentation of suitable habitat in the Chino and Puente Hills from ongoing development will contribute to the regional decline of these species. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable roosting habitat in the region. Implementation of APMs BIO-1, BIO-4, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), AQ-1a (Implement Construction Fugitive Dust Control Plan), B-33a (Maternity colony or hibernaculum surveys for roosting bats), B-33b (Provision of substitute roosting bat habitat), and B-33c (Exclude bats prior to demolition of roosts) would reduce these impacts.

  Impacts to pallid bat, western red bat, and hoary bat are cumulatively considerable in Upper Big Tujunga Canyon on the ANF. Fuel treatments proposed by the FS for Upper Big Tujunga Canyon overlaps with Segment 6 of the proposed Project, approximately 0.6 miles east-northeast of the intersection of Angeles Crest Highway and Upper Big Tujunga Canyon Road. At this site, the FS will remove shrubs and understory fuels from 50.4 acres of Coulter pine forest and mixed chaparral. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the ~~impact~~ proposed Project ~~substantially~~ reduces the acreage of suitable roosting habitat in the region. Implementation of the measures identified above would reduce these impacts. However, the impacts to special-status bats have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project ~~would~~ could result in transmission line strikes with special-status bat species (B-34).** The Antelope Transmission Project Segments 1-3 proposes the construction of approximately 51 miles of transmission lines for the western Antelope Valley in the vicinity of the Project. This transmission line project in combination with the proposed Project would cumulatively increase the probability of transmission line strikes for special-status bat species in the Northern Region. However, as discussed in Section 3.4.6.1 (Direct and Indirect Effects Analysis) the frequency of transmission line strikes by special-status bats is expected to be quite low despite these cumulative effects, due to the ability of these bat species to detect and avoid transmission lines during echolocation. Therefore, the cumulative impacts of transmission line strikes on special-status bat species resulting from the Project and other past, present, and reasonably foreseeable projects will be less than significant (Class III).
- **The Project ~~would~~ could result in the mortality of, and loss of habitat for, special-status mammals (B-35).** Impacts to the Los Angeles pocket mouse, Tehachapi pocket mouse, San Joaquin pocket mouse, Northwestern San Diego pocket mouse, Southern grasshopper mouse, Tulare grasshopper mouse, and San Diego black-tailed jackrabbit are cumulatively considerable. The cumulative projects would combine within the regions of occurrence for these species. The proposed Project will not eliminate suitable habitat for Los Angeles pocket mouse, San Joaquin pocket mouse, Tulare grasshopper mouse, and Tehachapi pocket mouse. However, the proposed Project would result in the loss of habitat for northwestern San Diego pocket mouse, southern grasshopper mouse, and San Diego black-tailed jackrabbit. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a

Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to special-status mammal species. However, construction-related impacts to special-status mammals have the potential to combine with similar impacts of past and foreseeable future projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project ~~would~~ could result in the mortality of, and loss of habitat for, San Diego desert woodrat (B-36).** Impacts to San Diego desert woodrat are cumulatively considerable within the Puente and Chino Hills portion of the proposed Project. There are six residential development projects proposed or in progress within the Chino and Puente Hills, between 0 and 2.6 miles from the proposed Project (Table 3.4-26). These projects include large community developments, including 4,902 acres of grassland, shrub, or woodland habitat that would be impacted. These collective projects would result in the loss of suitable habitat for the San Diego desert woodrat. Continued loss and fragmentation of suitable habitat in the Chino and Puente Hills from ongoing development will contribute to the regional decline of these species. The proposed Project will eliminate approximately 80 acres of suitable habitat for this species within the Chino and Puente Hills of the proposed Project area. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable habitat in the region. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-36 (Conduct focused surveys for San Diego desert woodrats and passively relocate), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts. However, the impacts to San Diego desert woodrat have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could result in the mortality of, and loss of habitat for, the ringtail (B-37).** Impacts to ringtail are cumulatively considerable within Amargosa Creek, Upper Big Tujunga Creek, Mill Creek, San Ganriel River, Fall Creek, and Tonner Canyon. The Amargosa Creek Improvements Project includes road improvements to Elizabeth Lake Road and flood control improvements to approximately 5 miles of Amargosa Creek in the Leona Valley. This infrastructure improvement project intersects the proposed Project at Amargosa Creek and Elizabeth Lake Road.

  Fuel treatments are proposed by the FS for both Mill Creek Summit and Upper Big Tujunga Canyon, and both of these areas directly overlap with Segment 6. Ongoing vehicle and recreation access on the West Fork of the San Gabriel River to access Cogswell reservoir could also cumulatively contribute to the decline of this species. Fuel treatments at these sites will substantially reduce the amount of shrub and tree cover around FS Administrative Sites within the ANF. These include the treatment of 6.13 acres of Coulter pine forest at Mill Creek Station (Mill Creek Summit along Angeles Crest Highway) and 50.4 acres of Coulter pine forest and mixed chaparral at Shortcut Station in Upper Big Tujunga Canyon (0.6 miles east-northeast of the intersection of Angeles Crest Highway and Upper Big Tujunga Canyon Road). However, the amount of these habitats that will be cumulatively impacted by these FS projects and the proposed Project within the ANF will be small relative to the home range requirement of a ringtail and the availability of habitat in the ANF of the San Gabriel Mountains (46,882 acres of bigcone Douglas fir-canyon oak forest; 38,782 acres of canyon oak forest; 11,177 acres of coast live oak woodland; and 562 acres of Coulter pine forest; Stephenson and Calcarone, 1999).

  There is a total of 1,752 acres of grassland, shrub, and woodland habitat that will be lost due to residential development projects within one mile of Tonner Canyon within the Chino and Puente Hills (Table 3.4-26). However, the proposed Project will impact a small amount of suitable ringtail habitat within Tonner Canyon, and the Tonner Canyon to Carbon Canyon region of the Chino Hills contains more than 2,047 acres of suitable woodland habitat (Spencer 2005). The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable ringtail habitat in the region. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-37 (Conduct focused surveys for ringtail and passively relocate during the non-breeding season), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts. However, the impacts to ringtail have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).

- **The Project ~~would~~ could result in mortality of American badgers (Impact B-38).** Impacts to American badger are cumulatively considerable within the Northern and Southern Regions of the proposed Project. In the Northern Region, three large-scale planned community developments, totaling 2,303 acres, are planned for a location near the existing Antelope Substation, within 1.5 miles from the Project. Two other sizeable projects with potential to reduce suitable American badger habitat in the Northern Region are the 6,400-acre PdV Wind Energy facility planned for a location just east of Segment 10 and the 640-acre Antelope Valley Water Bank facility to be located adjacent to the proposed Whirlwind Substation. Impacts to American badger are also cumulatively considerable within the Puente and Chino Hills portion of the proposed Project. There are six residential development projects proposed or in progress within the Chino and Puente Hills, between 0 and 2.6 miles from the proposed Project (Table 3.4-26). These projects include large community developments on currently undeveloped land, including 4,902 acres of grassland, shrub, or woodland habitat. Continued loss and fragmentation of suitable grassland and open shrub habitat in the Antelope Valley and Chino and Puente Hills from ongoing development will contribute to the regional decline of this species. The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable habitat in these two regions. Implementation of APMs BIO-1, BIO-4, BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-38 (Conduct focused surveys for American badger and passively relocate during the non-breeding season), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts. However, the impacts to American badger have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could result in the loss of wetland habitats (Impact B-39).** As described in Section 3.4.2 (Affected Environment), these habitat types contain vegetation growing near permanent water sources or under conditions of prolonged saturation. There are 1,116 acres of riparian habitats in the project area, of these approximately 12 acres are anticipated to be affected by construction of the proposed Project (see Tables 3.4-17 and 3.4-18). Throughout California, wetland habitats have been degraded and lost at an alarming rate due to the placement of fill for development. Any impacts to wetland habitat types would be regulated by the CDFG, RWQCB, and the USACE. As described in Section 3.4.6.1 (Direct and Indirect Effects Analysis), any impacts to these habitat types are significant and would require mitigation. As such, any Project impacts, should they occur, would also contribute to the cumulative loss of these habitat types when combined with the loss of these habitat types caused by other past and reasonably foreseeable projects, and therefore would be significant. However, the mitigation measures described in Section 3.4.6.1 (Mitigation Measures B-1a [Provide restoration/compensation for impacts to native vegetation communities], B-1b [Implement a Worker Environmental Awareness Program], Mitigation Measure B-2 [Implement RCA Treatment Plan], B-3a [Prepare and implement a Weed Control Plan], H-1a [Implement an Erosion Control Plan and demonstrate compliance with water quality permits], and AQ-1a [Implement Construction Fugitive Dust Control Plan]) for impacts to these habitats will reduce Project impacts. However, though impacts to wetlands from this project are anticipated to be minor based on the acres anticipated to be affected, the impacts to wetland habitats have the potential to combine with similar impacts of other projects and would be considered cumulatively significant and unavoidable (Class I).
- **The Project ~~would~~ could result in the loss of established bird and bat migratory corridors (B-40).** The loss of established bird and bat migratory corridors as a result of transmission line construction is cumulatively considerable within the Northern Region of the Project, where approximately 17 miles of transmission lines proposed in the Antelope Transmission Project Segment 2 would come within close proximity (>0.5 mile) to Segment 5 of the Project. However, as discussed in Section 3.4.6.1 (Direct and Indirect Effects Analysis) these transmission lines are not located along major landbird migration routes and are not expected to have a significant cumulative effect on migratory patterns or migration routes for birds within the Northern Region.

  The Antelope Transmission Project in combination with the proposed Project could potentially occur along a significant migratory route in the Antelope Valley for migratory bats, including western red bat and hoary bat. However, despite these cumulative effects, these migratory corridors would not be lost owing to the ability of these bat species to detect and avoid transmission lines during echolocation. Therefore, the cumulative impacts of transmission lines on bird and bat migratory corridors resulting from the Project and other past, present, and reasonably foreseeable projects will be less than significant (Class III).
- **Corona noise ~~would~~ could result in disturbance to wildlife (B-41).** As described in Section 3.4.6.1, as the effects of corona noise on wildlife are poorly understood, and it is difficult to predict the degree to which the

increase in corona noise will impact local wildlife, including special-status species. Animals, especially breeding birds and other wildlife that use sound for communication, would be expected to move away from the line in order to minimize interference with communication. However, because of the availability of habitats in the project area, this would not be expected to constitute a substantial impact. Corona noise is already present along most of the proposed Project, and while the proposed Project will result in louder corona noise for most segments, wildlife can be expected to have already been exposed and likely habituated to this disturbance. As such, corona noise from the proposed Project is not expected to combine with noise from other projects in a cumulatively significant manner. Therefore, the cumulative impacts of corona noise to wildlife resulting from the Project and other past, present, and reasonably foreseeable projects will be less than significant (Class III).

- **The Project would result in effects to Management Indicator Species (B-42).** The Project would result in effects to Management Indicator Species. The ANF LRMP (USDA 2005) requires forest scale monitoring of habitat status and trend for select Management Indicator Species (MIS) on the ANF. MIS are likely to be subject to various levels of disturbance from implementation of the proposed Project on NFS lands. The total area impacted by the proposed Project is relatively small and includes approximately 272 acres of ground disturbance on the ANF. This represents less than one percent of the total Forest area. However, projects such as fuels treatments and special use permitted activities are proposed on the ANF. These cumulative projects would result in unknown acreages of habitat loss for MIS. To reduce effects of the proposed Project on MIS SCE would implement APM BIO-1, APM BIO-2, AMP BIO-3, APM BIO-4, APM BIO-5, APM BIO-6 and APM BIO-7. To further reduce effects of the proposed Project on MIS SCE shall implement Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads), B-5 (Conduct pre-construction surveys and monitoring for breeding birds), B-8b (Conduct biological monitoring), B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), B-30 (Conduct pre- and during construction nest surveys for spotted owl), AQ-1a (Implement Construction Fugitive Dust Control Plan), ~~and~~ H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and H-1b (Dry weather construction). However, the impacts to MIS have the potential to combine with similar impacts of other projects and would be considered significant and unavoidable (Class I).

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for the proposed Project in Section 3.4.6.1 (Direct and Indirect Effects Analysis) would help to reduce the proposed Project's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level for biological resources.

3.4.7 Alternative 3: West Lancaster Alternative

The following section describes the impacts of Alternative 3 (West Lancaster Alternative) on Biological Resources, as determined by the significance criteria listed in Section 3.4.4.1. Mitigation measures are introduced where necessary in order to reduce significant impacts to less-than-significant levels. As described in Section 2.3, this alternative would deviate from the proposed route along Segment 4, at approximately S4 MP 14.9, where the new 500-kV transmission line would turn south down 115th Street West for approximately 2.9 miles and turn east for approximately 0.5 mile, rejoining the proposed route at S4 MP 17.9. This re-route would increase the overall distance of Segment 4 by approximately 0.4 mile; however, the number of overall structures would decrease by one due to greater spacing between structures compared to the proposed Project.

The portion of Segment 4 that would be re-routed for Alternative 3 is situated in an area that has previously been used for agriculture. Land use on either side of the re-routed segment is characterized primarily as California annual grassland, with several areas of native wildflower fields and desert wash.

With the exception of additional impacts to several additional desert washes, small areas of California annual grassland and wildflower fields, no new impacts to biological resources would be introduced under Alternative 3. The Affected Environment along the rest of the Alternative 3 route in the North Region is identical to the proposed Project. Furthermore, temporary and permanent ground disturbance as it relates to the re-routed portion of the alternative would amount to only incremental increases in impacts to these additional areas.

3.4.7.1 Direct and Indirect Effects Analysis

The significance criteria used to identify impacts to Biological Resources are introduced in Section 3.4.4.1 (Criteria for Determining Impact Significance). Impacts associated with this alternative are presented below under the applicable significance criterion.

Impacts to Riparian or Natural Communities (Criterion BIO1)

Impacts associated with Criterion BIO1 for Alternative 3 would be the same as impacts associated with this criterion for the proposed Project. Although this alternative introduces a re-route for an approximately 0.4-mile section of the proposed transmission line in the Northern Region, the number of towers constructed would be one less than the proposed Project and the re-route would cross identical habitat types as the proposed Project (California annual grassland, wildflower fields, and desert wash). Furthermore, temporary and permanent ground disturbance as it relates to the re-routed portion of the alternative would be primarily due to the new access and spur roads and would result in impacts approximately the same size and magnitude as the proposed Project. The impacts and their associated mitigation measures that fall under Criterion BIO1 are summarized in the following paragraphs. Please see Section 3.4.6.1 (Direct and Indirect Effects Analysis) for a detailed description of these impacts, as they are the same as discussed for the proposed Project.

Impact B-1: Construction activities would result in temporary and permanent losses of native vegetation.

With the exception of several additional desert washes, small areas of California annual grassland, and wildflower fields that would be subject to disturbance, no new impacts to native vegetation would be introduced under Alternative 3. Furthermore, temporary and permanent ground disturbance would be approximately the same size and magnitude, or less than the proposed Project. As described in detail in Section 3.4.6.1, with the exception of agricultural or barren/developed land, construction activities that result in the disturbance to the plant communities identified above would be considered a significant impact without mitigation. Therefore, Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would be implemented to reduce impacts to native vegetation to less than significant (Class II) and no additional mitigation is required.

Impact B-2: The Project would result in the loss of desert wash or riparian habitat.

Because of the presence of several additional desert washes within the Alternative 3 alignment and overall loss of desert wash and riparian habitat within California, along with the role of these habitats in providing functional hydrological connectivity to downstream waters and their suitability to support several special-status species, the loss of desert wash habitat associated with Alternative 3 would be significant without mitigation. SCE intends to avoid these areas to the maximum extent practicable;

however, some desert wash habitat would be impacted in the re-routed portion of this alternative. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant (Class II) levels and no additional mitigation is required.

Impact B-3: The Project would result in the establishment and spread of noxious weeds.

Impacts associated with noxious weeds would be the same as described for the proposed Project in the Central and Southern Regions. With the exception of several additional desert washes and small areas of California annual grassland and wildflower fields that would be subject to disturbance, no new impacts to native vegetation would be introduced under Alternative 3. However, these additional impacted areas would marginally increase the potential for the establishment and spread of noxious weeds in the Northern Region. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), and B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads), would reduce impacts to less than significant (Class II). Therefore, no additional mitigation measures are required to minimize impacts due to noxious weeds.

Impact B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.

Compared to the proposed Project, no new types of impacts to biological resources would be introduced under Alternative 3. However, because implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers, construction disturbance would be slightly smaller in size and magnitude for some terrestrial wildlife species. Impacts would be identical to the proposed Project in all other areas of this alternative. Therefore, Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would be implemented to reduce impacts to less than significant **(**Class II**)** and no additional mitigation measures are required.

Impact B-5: Construction activities conducted during the breeding season would result in the loss of nesting birds and raptors.

With the exception of several additional desert washes and small areas of California annual grassland and wildflower fields that would be subject to disturbance, no new impacts to native vegetation would be introduced under Alternative 3. However, because implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile, the potential loss of nesting birds would be slightly greater due to the increased line length and potential for collision. See Impact B-21 for more information related to avian collisions with transmission lines. Impacts would be identical to the proposed Project in all other areas of this alternative. Therefore, Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust

Control Plan) would be implemented to reduce impacts to nesting birds. Implementation of these mitigation measures would reduce impacts to less than significant (Class II). No additional mitigation measures are required.

Impact B-6: The Project would cause the loss of foraging habitat for wildlife.

Compared to the proposed Project, implementation of Alternative 3 would increase the length of Segment 4 by 0.4 mile but decrease the number of transmission towers along Segment 4 by one. The impacted area would be smaller in size, and would result in an incremental decrease in the loss of foraging habitat for wildlife species. Impacts would be identical to the proposed Project in all other areas of this alternative. These impacts would require the implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), and Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits). Implementation of the specified mitigation measures would reduce impacts to less than significant (Class II) and no additional mitigation measures are required.

Impacts to Endangered or Threatened Species, or Proposed or Critical Habitat (Criterion BIO2)

Ground-disturbing activity, including tower pad preparation and construction, grading of new access roads, tower removal, and use or improvement of existing access roads has the potential to disturb listed plant and wildlife species. Impacts to these species are detailed below. Impacts to individual species would be the same as described for the proposed Project (Section 3.4.6.1).

Impact B-7: The Project ~~would~~ could disturb endangered, threatened, or proposed plant species or their habitat.

Compared to the proposed Project, the Alternative 3 re-route would result in the substantially similar impacts related to the loss of habitat for, and potential disturbance to rare plants, if present. While Alternative 3 would increase the length of the transmission line by 0.4 mile, it would result in one fewer transmission structure as compared to the proposed Project, which would incrementally decrease the potential to disturb listed plants. However, this alternative would potentially require the construction of new access and/or spur roads, which could impact listed plants, if present. The implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.) would reduce impacts to endangered, threatened, and proposed plant species, if present, to less-than-significant levels (Class II). No additional mitigation measures are required.

Impact B-8: The Project ~~would~~ could result in the loss of California red-legged frog and Mountain yellow-legged frog.

Compared to the proposed Project, no new impacts to biological resources would be introduced under Alternative 3. Suitable habitat for the California red-legged frog and mountain yellow-legged frog would not be reduced under this alternative, as suitable habitat is not present for these species within the

Alternative 3 re-route. Therefore, impacts to these species would be exactly the same as those described for the proposed Project (Section 3.4.6.1). The implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8a (Conduct protocol surveys for California red-legged frogs and implement avoidance measures), and Mitigation Measure B-8b (Conduct biological monitoring) would reduce potential impacts to these species a less-than-significant level (Class II). Therefore, no additional mitigation measures are required to minimize impacts to these amphibians.

Impact B-9: The Project would result in the loss of arroyo toad.

Compared to the proposed Project, Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers, thus impacts would be slightly less in size and magnitude for some wildlife species. However, impacts in the re-routed portion of this alternative would not affect arroyo toad, as suitable habitat is not present for this species within the Alternative 3 re-route. Therefore, impacts to arroyo toad would be exactly the same as those described for the proposed Project (Section 3.4.6.1). SCE would be required to implement APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), and Mitigation Measure B-8b (Conduct biological monitoring). These measures include, but are not limited to, avoiding the peak breeding period, the placement of exclusion fencing if animals are present, implementation of a capture and release program, and construction monitoring by authorized biologists. Implementation of these measures would avoid or mitigate take, including loss of habitat, if present, thereby reducing potential impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures are required to minimize impacts to the arroyo toad.

Impact B-10: The Project ~~would~~ could result in the loss of desert tortoise.

Compared to the proposed Project, the implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one, and impacts would be slightly less in size and magnitude for some wildlife species. Impacts in the re-routed portion of this alternative will not affect suitable habitat for desert tortoise, as suitable habitat is not present for this species within the Alternative 3 re-route. Therefore, impacts to desert tortoise would be exactly the same as described for the proposed Project (Section 3.4.6.1). Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-10 (Conduct surveys for desert tortoises and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid or mitigate effects to this species, including loss of habitat, if present, thereby

reducing potential impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures are required.

Impact B-11: The Project ~~would~~ could result in mortality of desert tortoises as a result of increased predation by common ravens.

Compared to the proposed Project, implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one. However, potential nest sites for common raven as a result of tower construction are not expected to change as a result of implementation of Alternative 3 and impacts would be the same as described for the proposed Project (Section 3.4.6.1). These impacts would not require mitigation because potential nest sites for common raven as a result of tower construction are not expected to increase appreciably. Therefore, additional populations of common raven and their predation pressure on the desert tortoise are not expected to result from additional towers, and impacts are expected to be less than significant (Class III).

Impact B-12: The Project ~~would~~ could result in the loss of special-status fish.

Compared to the proposed Project, implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one. However, suitable habitat for special-status fish is not present within the Alternative 3 re-route. Therefore, impacts to special-status fish would be identical to those described for the proposed Project (Section 3.4.6.1). Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring) and B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), would reduce these impacts to less than significant levels (Class II). Therefore, no additional mitigation measures are required.

Impact B-13: The Project ~~would~~ could result in the loss of Critical Habitat for the Santa Ana sucker.

Compared to the proposed Project, the implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one, and impacts would be slightly less in size and magnitude for some wildlife species. Impacts in the re-routed portion of this alternative will not affect critical habitat for Santa Ana sucker, as critical habitat is not present for this species within the Alternative 3 re-route. Therefore, impacts to Santa Ana sucker critical habitat would be exactly the same as described for the proposed Project (Section 3.4.6.1). Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms) would reduce this impact to less than significant (Class II). Therefore, no additional mitigation measures are required.

Impact B-14: The Project ~~would~~ could result in the loss of California condor.

Implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one, and impacts would be slightly smaller in size and magnitude for some species. The Alternative 3 re-route will not substantially reduce suitable habitat for California condor or substantially increase impacts associated with micro-trash ingestion. Therefore, impacts to this species would be the same as those described for the proposed Project (Section 3.4.6.1). Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-14 (Monitor construction in condor habitat and remove trash and micro-trash from the work area daily) to avoid or mitigate take, including the loss of habitat and the potential for micro-trash ingestion, would reduce impacts to this species, if present, to less-than-significant levels (Class II). Therefore, no additional mitigation measures are required.

Electrocutions and/or line collisions as a result of Project implementation are discussed further under Impacts B-20 and B-21.

Impact B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.

Compared to the proposed Project, no new impacts to listed riparian birds would occur, as suitable habitat is not present for these species within the Alternative 3 re-route. Therefore, impacts would be exactly the same as those described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure B-15 (Conduct protocol surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). These measures would reduce impacts to listed riparian birds, if present, to less than significant (Class II). Therefore, no additional mitigation measures are required.

Impact B-16: The Project would result in the loss of coastal California gnatcatchers.

Compared to the proposed Project, implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one. However, these impacts will not affect the likelihood of loss of coastal California gnatcatchers, as suitable habitat is not present for this species within the Alternative 3 re-route. Therefore, impacts to this species would be exactly the same as those described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-4 through BIO-6 and Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-16 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to reduce impacts to less-than-significant levels (Class II). No additional mitigation measures are required.

Impact B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.

As described above, suitable habitat for this species does not occur in the Alternative 3 re-route and no additional impacts to this species are associated with the alternative. Therefore, impacts to coastal California gnatcatcher habitat would be the same as described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measures B-16 and B-17 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures, Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to reduce impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures are required.

Impact B-18: The Project ~~would~~ could disturb nesting Swainson's Hawks.

With the exception of several additional desert washes and small areas of California annual grassland and wildflower fields that would be subject to disturbance, no new impacts to native vegetation would be introduced under Alternative 3. Because implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile, potential disturbance to nesting Swainson's hawks would be slightly greater in magnitude if suitable nest structures are available adjacent to construction areas. However, these added impacts would be marginal and would not substantially increase impacts associated with nest disturbance as compared to the proposed Project. Implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1b (Implement a Worker Environmental Awareness Program), B-18a and B-18b (Conduct pre-construction surveys for Swainson's hawks, Removal of nest trees for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures are required.

Impact B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.

Under Alternative 3 impacts to Swainson's hawk foraging habitat would be marginally smaller than those described for the proposed Project (Section 3.4.6.1) due to the fact that there would be one fewer transmission tower. Incremental impacts to suitable Swainson's hawk foraging habitat associated with Alternative 3 would not substantially reduce the habitat available for the species, reduce the number, cause populations to drop below self-sustaining levels, restrict the range, or threaten to eliminate populations. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-18a (Conduct pre-construction surveys for Swainson's hawks), B-19 (Compensate for loss of foraging habitat for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures are required.

Impact B-20: The Project ~~would~~ could result in electrocution of State and/or federally protected birds.

Because implementation of Alternative 3 would increase the length of conductor lines along Segment 4 by 0.4 mile, the impacted area would be greater in size, and the potential for electrocution of State and/or federally protected birds would be slightly greater. However, the increase in the frequency of transmission line electrocutions due to this 0.4-mile addition of transmission lines is expected to be

extremely low. Therefore, the number of electrocution events is still expected to be insufficient to substantially reduce the number of State and/or federally protected bird species. SCE would implement APMs BIO-4 and BIO-9 as part of the proposed Project in accordance with the guidance on raptor protection in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). However, because of the long duration of the construction phase of the proposed Project, APLIC may update the guidelines during this time frame. Therefore, SCE shall use the most recent APLIC guidelines for protection of raptors on power lines. Impacts to State and/or federally protected birds resulting from electrocution would be less than significant (Class III) and no additional mitigation is required.

Impact B-21: The Project ~~would~~ could result in result in collision with overhead wires by State and/or federally protected birds.

Because implementation of Alternative 3 would increase the length of conductor lines along Segment 4 by 0.4 mile, the impacted area would be greater in size, and the potential for collisions with overhead wires by State and/or federally protected birds would be slightly greater. However, the increase in the frequency of transmission line strikes due to this 0.4-mile addition of transmission lines is expected to be extremely low. Therefore, the number of collision events with overhead wires is still expected to be quite low and insufficient to substantially reduce the number of State and/or federally protected bird species. This impact would require implementation of APM BIO-9 and the incorporation of raptor safety protection into the project design (i.e. tower/conductor [lines] on NFS lands). Line collisions as a result of Alternative 3 implementation will not substantially reduce the number of State and/or federally protected birds, cause populations to drop below self-sustaining levels, restrict the range, or threaten to eliminate populations. Therefore, impacts to State and/or federally protected birds resulting from transmission line collisions would be considered less than significant (Class III) and no additional mitigation is required.

Impact B-22: The Project ~~would~~ could result in disturbance to Mohave ground squirrel.

With the exception of several additional desert washes and small areas of California annual grassland and wildflower fields that would be subject to disturbance, no new impacts to native vegetation would be introduced under Alternative 3. Because implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one, impacts would be slightly smaller in size and magnitude for some species. Impacts related to the implementation of Alternative 3 would not increase the likelihood of disturbance to Mohave ground squirrel, as suitable habitat was not identified for this species within the Alternative 3 re-route. Therefore, impacts to this species would be exactly the same as those described for the proposed Project (Section 3.4.6.1). Implementation of APMs BIO-4 through BIO-7 and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measures B-22a (Conduct protocol surveys for Mohave ground squirrels), B-22b (Implement construction monitoring for Mohave ground squirrels), and B-22c (Preserve off-site habitat for the Mohave ground squirrel) would reduce impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures are required.

Have a substantial adverse effect on a candidate, Forest Service Sensitive, or special-status species (Criterion BIO3)

Impact B-23: The Project would result in loss of candidate, Forest Service Sensitive, or special-status plant species.

Compared to the proposed Project, implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one. Impacts would be slightly smaller in size and magnitude for several special-status plant species, such as California androsace and Peirson's morning-glory, if present. Impacts to these species would require avoidance (Mitigation Measure B-7, Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.), and, if avoidance is infeasible, off-site acquisition and preservation of occupied habitat (Mitigation Measure 23, Preserve offsite habitat/management of existing populations of special-status plants). Temporarily impacted habitat would be restored upon completion of construction (Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities). As discussed above, indirect effects to these species that could occur due to the proliferation of noxious weeds resulting from ground-disturbing Project activities shall be reduced by the implementation of Mitigation Measure B-3a (Prepare and implement a Weed Control Plan). In addition, a Worker Environmental Awareness Program will be implemented (Mitigation Measure B-1b, Implement a Worker Environmental Awareness Program), erosion control would be implemented (H-1a Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and dust control measures would be implemented (Mitigation Measure AQ-1a, Implement Construction Fugitive Dust Control Plan). Implementation of these mitigation measures would reduce impacts to less than significant (Class II). No additional mitigation measures are required.

Impact B-24: The Project ~~would~~ could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.

Alternative 3 would not increase the likelihood of mortality, injury, or loss of habitat for southwestern pond turtle as suitable habitat was not identified for this species within the Alternative 3 re-route. Therefore, impacts to this species would be exactly the same as those described for the proposed Project (Section 3.4.6.1). Implementation of APMs BIO-1 through BIO-3 and BIO-5 through BIO-7, and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-24 (Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would prevent mortality or injury of pond turtles, avoid damage or destruction of nesting areas or mitigate the loss of nesting habitat, thereby reducing potential impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures are required.

Impact B-25: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.

Compared to the proposed Project, Alternative 3 would not increase the likelihood of mortality, injury, or loss of habitat for two-striped garter snakes and south coast garter snakes as suitable habitat was not identified for these species within the Alternative 3 re-route. Therefore, impacts to these species would be exactly the same as those described for the proposed Project and would require implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-25 (Conduct focused surveys for the two-striped garter snake and south coast garter snake and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to avoid injury or mortality to these species, thereby reducing potential impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures are required.

Impact B-26: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, Coast Range newts.

Alternative 3 would not increase the likelihood of mortality, injury, or loss of habitat for Coast Range newts as suitable habitat was not identified for this species within the Alternative 3 re-route. Therefore, impacts to this species would be exactly the same as described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-26 (Conduct focused surveys for coast range newt and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to avoid injury or mortality to this species, thereby reducing impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures are required.

Impact B-27: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.

Implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one, and impacts would be slightly smaller in size and magnitude for the following three special-status terrestrial herpetofauna species, if present: 1) San Diego horned lizard, 2) California horned lizard, and 3) silvery legless lizard. Implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-27 (Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to

less than significant (Class II). The other eight special-status terrestrial herpetofauna species identified in Section 3.4.6.1 do not occur within the area of potential impacts of the Alternative 3 re-route, and for those species impacts are identical to the proposed Project.

Impact B-28: The Project ~~would~~ could disturb wintering mountain plovers.

With the exception of several additional desert washes and small areas of California annual grassland and wildflower fields that would be subject to disturbance, no new impacts to native vegetation would be introduced under Alternative 3. Because implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one, impacts would be slightly smaller in size and magnitude for some species. These impacts will not increase the likelihood of disturbance to wintering mountain plovers as the total acreage of impacted habitat is small relative to regional availability, and implementation of Alternative 3 would not restrict the range of the species. Therefore, these impacts would not require mitigation. Impacts to wintering mountain plovers resulting from construction disturbance are considered less than significant (Class III). No additional mitigation measures are required.

Impact B-29: The Project would result in the loss of occupied burrowing owl habitat.

Compared to the proposed Project, the implementation of Alternative 3 would increase the length of Segment 4 by 0.4 mile but decrease the number of transmission towers along Segment 4 by one. The impacted area affected by this alternative would be smaller in size, and the loss of occupied burrowing owl habitat would potentially be slightly smaller in magnitude than that described for the proposed Project. Impacts would be identical to the proposed Project in all other areas of this alternative. These impacts would require the implementation of APMs BIO-2 and BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-29 (Implement CDFG protocol for burrowing owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Implementation of the specified mitigation measures for the proposed Project would reduce impacts to less than significant (Class II).

Impact B-30: The Project would result in the loss of occupied California spotted owl habitat.

Alternative 3 would not increase the likelihood of loss of occupied California spotted owl habitat as suitable habitat was not identified for this species within the Alternative 3 re-route. Therefore, impacts to California spotted owl would be exactly the same as the proposed Project (Section 3.4.6.1) and would require implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Impacts to the California spotted owl resulting from loss of occupied habitat are considered less than significant with mitigation incorporated (Class II). Therefore, no additional mitigation measures are required.

Impact B-31: The Project ~~would~~ could disturb nesting California spotted owls.

Alternative 3 would not increase the likelihood of disturbance to nesting California spotted owls as suitable habitat was not identified for this species within the Alternative 3 re-route. Therefore, impacts would be exactly the same as those described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-2 and BIO-4 through BIO-6 and Mitigation Measure B-1b (Implement a

Worker Environmental Awareness Program), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to reduce impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures are required.

Impact B-32: The Project ~~would~~ could disturb nesting avian "species of special concern."

Construction-related disturbance that causes nest abandonment and/or loss of reproductive effort would constitute a significant impact and violate the MBTA. With the exception of several additional desert washes and small areas of California annual grassland and wildflower fields that would be subject to disturbance, no new impacts to native vegetation would be introduced under Alternative 3. Because implementation of Alternative 3 would increase the length of Segment 4 by 0.4 mile, the impacted area would be slightly greater in size, and disturbance to nesting avian species of special concern would potentially be slightly greater in magnitude than that described for the proposed Project (Section 3.4.6.1). However, implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No additional mitigation measures are required.

Impact B-33: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status bat species.

Because implementation of Alternative 3 would increase the length of Segment 4 by 0.4 mile, the impacted area would be slightly greater in size. Potential for mortality of and loss of habitat for special-status bat species would be slightly greater in magnitude over the proposed Project if suitable trees, particularly trees ≥12 inches in diameter at 4.5 feet above grade with loose bark or other cavities are present prior to construction activities. In all areas other than the re-route, impacts to special-status bat species would be exactly the same as described for the proposed Project. If active hibernacula and maternity roosts are present and cannot be avoided, impacts would be significant. However, implementation of APMs BIO-1, BIO-4, BIO-6, and Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), AQ-1a (Implement Construction Fugitive Dust Control Plan), B-33a (Maternity colony or hibernaculum surveys for roosting bats), B-33b (Provision of substitute roosting bat habitat), and B-33c (Exclude bats prior to demolition of roosts) would reduce impacts to a less-than-significant level (Class II).

Impact B-34: The Project ~~would~~ could result in transmission line strikes by special-status bat species.

The Project would potentially impact these species through the direct take of individuals from fatal strikes with transmission lines. Because implementation of Alternative 3 would increase the length of Segment 4 by 0.4 mile, the impacted area would be greater in size, and the potential for transmission line strikes would be slightly greater in magnitude. However, given that most bat species can use echolocation to discriminate objects as small as 0.4 to 0.004 inches in size (Vaughan 1986), and the size of guard lines and 500-kV or 220-kV transmission lines are typically equal to or greater than 0.5 inches in diameter (SCE 2007), the frequency of transmission line strikes is expected to be extremely low. Therefore, the

number of fatal strikes is still expected to be quite low and insufficient to substantially reduce the number of these species (Class III).

Impact B-35: The Project ~~would~~ could result in mortality of and loss of habitat for, special-status mammals.

Compared to the proposed Project, no new impacts to biological resources would be introduced under Alternative 3. The area of suitable habitat for the Los Angeles pocket mouse, Tehachapi pocket mouse, San Joaquin pocket mouse, and Northwestern San Diego pocket mouse impacted by the Alternative 3 re-route would be slightly smaller in size than the proposed Project. Although the habitat impacted by implementation of Alternative 3 would not substantially reduce available habitat there remains the possibility of mortality to these species during construction and maintenance activities. Implementation of APM BIO-1 and APM BIO-5 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would minimize impacts to special-status mammal species. Therefore, impacts to these species as a result of implementation of Alternative 3 would be less than significant with mitigation incorporated (Class II). Southern grasshopper mouse, Tulare grasshopper mouse, and San Diego black-tailed jackrabbit do not occur within the Alternative 3 re-route alignment and therefore, impacts would be identical to the proposed Project.

Impact B-36: The Project ~~would~~ could result in mortality of San Diego desert woodrat.

Alternative 3 would not increase the likelihood of mortality to San Diego desert woodrat as the species does not occur within the Alternative 3 re-route. Therefore, impacts to this species would be identical to those described for the proposed Project (Section 3.4.6.1). Construction activities would substantially reduce regional populations of this species in the Chino and Puente Hills without mitigation. Impacts to this species as a result of Alternative 3 implementation would be reduced to a less-than-significant level (Class II) with the implementation of APMs BIO-1 and BIO-4 through BIO-6 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-36 (Conduct focused surveys for San Diego desert woodrats and passively relocate), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Therefore, no additional mitigation measures are required.

Impact B-37: The Project ~~would~~ could result in mortality of and loss of habitat for, the ringtail.

Implementation of Alternative 3 would not increase the likelihood of mortality to the ringtail as the species does not occur within the Alternative 3 re-route. In all other areas, impacts to ringtail would be identical to those described for the proposed Project (Section 3.4.6.1) and would require the implementation of APMs BIO-1, BIO-4, and BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-37 (Conduct focused surveys for ringtail and passively relocate during the non-breeding season), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan), which would reduce project impacts to ringtail to a less-than-significant level (Class II). No additional mitigation measures are required.

Impact B-38: The Project ~~would~~ could result in mortality of American badgers.

Because implementation of Alternative 3 would increase the length of Segment 4 by 0.4 miles but decrease the number of transmission towers along Segment 4, the impacted area would be slightly smaller in size, and potential mortality of American badgers would be slightly smaller in magnitude. However, any potential mortality would be quite small relative to the overall population size and implementation of APMs BIO-1, BIO-4, BIO-5, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-38 (Conduct focused surveys for American badger and passively relocate during the non-breeding season), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No additional mitigation measures are required.

Have a substantial adverse effect on federally protected wetlands (Criterion BIO4)

Impact B-39: The Project ~~would~~ could result in the loss of wetland habitats.

With the exception of several additional desert washes and small areas of California annual grassland and wildflower fields that would be subject to disturbance, no new impacts to native vegetation would be introduced under Alternative 3. Implementation of Alternative 3 would increase the length of the Segment 4 alignment by 0.4 mile but decrease the number of transmission towers by one. However, these impacts would not increase the likelihood of adverse effects on federally protected wetlands as federally protected wetlands do not occur within the Antelope Valley and the Alternative 3 re-route. Therefore, impacts would be identical to those described for the proposed Project (Section 3.4.6.1). Any loss of these habitats associated with the proposed Project is significant. If avoidance of jurisdictional waters and wetlands is not possible, implementation of APMs BIO-1 through BIO-7, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) will reduce the impacts to federally protected wetlands to less-than-significant levels (Class II). Therefore, no additional mitigation measures are required.

Interfere substantially with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)

Impact B-40: The Project ~~would~~ could interfere with established bird and bat migratory corridors.

The Project would potentially impact migrating bird and bat species through interference with established migratory corridors as a result of fatal collisions with transmission lines. Because implementation of Alternative 3 would increase the length of Segment 4 by 0.4 mile, the impacted area would be greater in size, and interference with bird and bat migratory corridors would be slightly greater in magnitude. However, the frequency of transmission line strikes is still expected to be extremely low. Therefore, implementation of Alternative 3 would not substantially interfere with established bird or bat migratory corridors, and impacts to migrating bird and bat species would be less than significant (Class III).

Impact B-41: Corona noise ~~would~~ could result in disturbance to wildlife.

Corona generates audible noise during operation of transmission lines. The noise is generally characterized as a crackling, hissing, or humming sound and is most noticeable during wet conductor conditions such as rain or fog. Because implementation of Alternative 3 would increase the length of Segment 4 by 0.4 mile, the impacted area would be greater in size, and corona noise would be slightly greater in magnitude compared to the proposed Project. However, as the effects of corona noise on wildlife are poorly understood, it is difficult to predict the degree to which the increase in corona noise will impact local wildlife. Corona noise is already present along most of Alternative 3, and while Alternative 3 would result in louder corona noise for most segments and a new sources of corona noise for the new segments, wildlife can be expected to have already been exposed and likely habituated to this disturbance. Therefore, implementation of Alternative 3 would not result in substantial impacts due to corona noise. This impact would be less than significant (Class III).

Impact B-42: The Project would result in effects to Management Indicator Species.

The ANF LRMP (USDA 2005) requires forest scale monitoring of habitat status and trend for select Management Indicator Species (MIS) on the ANF. The Alternative 3 re-route does not occur on NFS lands, and therefore impacts to MIS would be exactly the same as described for the proposed Project. Impacts to these species as a result of Project implementation would be reduced to a less-than-significant level (Class II) with the implementation of APMs BIO-1 and BIO-4 through BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads), B-5 (Conduct pre- and during construction surveys and monitoring for breeding birds), B-8b (Conduct biological monitoring), B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), B-30 (Conduct pre- and during construction nest surveys for spotted owl), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan). Therefore, no additional mitigation measures are required.

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances (Criterion BIO6)

Because of the extensive planning involved in project design, including implementation of APMs BIO-1 through BIO-7, and the mitigation measures described above in Criteria BIO1 through BIO5, Alternative 3 is consistent with the local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. Compared to the proposed Project, with the exception of several additional desert washes and additional areas of California annual grassland and wildflower fields that may be impacted, no new impacts to biological resources would be introduced under Alternative 3. Likewise, no additional policies or ordinances apply to the Alternative 3 re-route. Therefore, no impact would occur.

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP (Criterion BIO7)

Through Project design and implementation of APMs BIO-1 through BIO-7 and the mitigation measures described in Criteria BIO1 through BIO5, SCE shall ensure consistency with the conservation goals of the WMPHCP. Compared to the proposed Project, with the exception of several additional desert washes, and additional areas of California annual grassland and wildflower fields that may be impacted, no new impacts to biological resources would be introduced under Alternative 3. Implementation of Alternative 3 will not affect the conservation goals of the WMPHCP. Therefore, no impact would occur.

3.4.7.2 Cumulative Effects Analysis

This section addresses potential cumulative effects that would occur as a result of implementation of Alternative 3 (West Lancaster Alternative). This alternative consists of a brief re-route of the proposed transmission line just north of Antelope Substation, which would add approximately 0.4 mile to the length of the route. The remainder of this alternative route (south of Antelope Substation) would be identical to that of the proposed Project and would, therefore, result in identical impacts as the proposed Project. The re-routed portion of the Alternative 3 route generally parallels the proposed Project route to the west. As a result, this alternative traverses the same or similar habitat types as the portion of the proposed Project route it is proposed to replace, would require the same types of construction activities to build, and would result in the same operational capacity as the proposed Project. Based on the substantial similarity of Alternative 3 to the proposed Project, this alternative's contribution to cumulative impacts would be identical to that of the proposed Project.

Geographic Extent

Alternative 3 only differs from the proposed Project for a very small portion of the proposed route in the City of Lancaster, near Antelope Substation. This area is still encompassed by the geographic extent of the cumulative analysis defined for Alternative 2 in Section 3.4.6.2. Therefore, the geographic extent of the cumulative analysis for Alternative 3 is exactly the same as that for Alternative 2 and would include all of the Northern, Central, and Southern Regions.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 3 are exactly the same as for Alternative 2, as described in Section 3.4.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 3 would be exactly the same as Alternative 2, described in Section 3.4.6.2.

Cumulative Impact Analysis

As described in Section 3.4.6.2, impacts associated with Alternative 3 would contribute to cumulative impacts~~be cumulatively considerable~~ if they would have the potential to combine with similar impacts of other past, present, or reasonably foreseeable projects. The minor re-route of the proposed Project transmission line associated with Alternative 3 would not differ from the proposed Project's contribution to cumulative impacts and therefore, cumulative impacts of Alternative 3 would be exactly the same as cumulative impacts for Alternative 2.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 3 in Section 3.4.7.1 (Direct and Indirect Effects Analysis) would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level.

3.4.8 Alternative 4: Chino Hills Route Alternatives

The following section describes impacts of Alternative 4 (Chino Hills Routes) on Biological Resources, as determined by the significance criteria listed in Section 3.4.4.1. Mitigation measures are introduced where necessary in order to reduce significant impacts to less-than-significant levels. As described in Section 2.4, this alternative is identical to the proposed Project for all Segments except Segments 8A and 8C. No construction would occur along Segment 8C, but upgrades to Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario would occur as described under Alternative 2. The route would deviate from the proposed Project beginning approximately 0.6 mile east of Tonner Canyon Road or 2 miles east of State Route 57 along Segment 8A. The proposed routes for Alternative 4 would cross through parts of Orange County, which the proposed Project (Alternative 2) would not enter, and San Bernardino County. The routing options for Alternative 4 would also cross through the Chino Hills State Park (CHSP). The five~~our~~ different routing options (Routes A through D and 4C Modified) which are included under Alternative 4 are discussed in further detail below.

Route A

This alternative would deviate from the proposed Project route 0.6 mi east of Tonner Canyon Road along Segment 8A and run parallel to the existing Walnut/Olinda-Mira Loma 220-kV transmission line for 6.2 miles, 2.3 miles of which would be within the CHSP. Route A would be situated within an existing utility corridor, but would require that the corridor be widened by 150 feet along the length of Route A. In addition, Route A would require the installation of a new switching station within the CHSP. The size of the new switching station would be approximately 5 acres in size.

Route B

The proposed Route B would follow the same path as Route A into CHSP but would continue to just beyond the eastern Park boundary and terminate at a new switching station immediately outside of the CHSP. As with the Route A alternative, the new switching station for Route B would be approximately 5 acres in size. Route B would travel through CHSP for approximately 4.6 miles. Approximately 150 feet of additional ROW would be required to accommodate the new 500-kV double-circuit structures along the re-routed portion of this alternative.

Route C

The proposed Route C alternative would follow the same path as Routes A and B up to the CHSP boundary. At this point, the alternative route would turn east along a new approximately 300-foot-wide ROW for approximately 1.8 miles, which would remain just north of the CHSP boundary, to a new 500-kV gas-insulated switching station. Approximately 3.6 miles of new ROW would be required to re-route the existing single-circuit 500-kV T/Ls in and out of the new switching station. The new north-south re-route into the switching station (1.6 miles within CHSP) would require an approximately 330-foot wide ROW. The new east-west re-route beginning at the switching station and proceeding north and east

around raptor ridge (2.0 miles, of which 1.7 miles is within CHSP) would require an approximately 480-foot wide ROW. Proposed Route C would also require the removal of existing transmission lines from within the CHSP. The proposed switching station for Route C would be located immediately north of Raptor Ridge and adjacent to Southern sycamore and coast live oak riparian forest.

Route C Modified

Route C Modified is similar to the original Route C option discussed above, with the exceptions that (1) the new gas-insulated switching station would be located approximately 2,500 feet northwest of the location described for the original Alternative 4C, (2) transmission line configurations and access roads would be altered to account for relocation of the switching station, and (3) re-routing of the existing single-circuit 500-kV towers in CHSP to the new switching station would occur utilizing double-circuit 500-kV towers. As with the original Route C, this proposed Route C Modified would also divert from the proposed Project Segment 8A at Mile 19.2, as well as re-route the existing 500-kV and 220-kV T/Ls from within CHSP, through a new switching station located north of CHSP. Route C Modified would require approximately 150 feet of new ROW along a 3.6-mile section to accommodate the new 500-kV double-circuit lines. Approximately 0.2 mile north of the CHSP boundary, Route C Modified would turn east within a new 225-foot-wide ROW for 0.7 mile, remaining north of the CHSP boundary, then turning northeast for approximately 0.4 mile, still within the new 225-foot-wide ROW, to a new 500-kV gas-insulated switching station. This route would also require the removal of existing transmission lines from within CHSP.

Route D

The proposed Route D alternative would follow the same path as Route C but would follow the northern boundary of CHSP for approximately 4.0 miles before crossing through the northeastern corner of the CHSP for approximately 1.4 miles. At this point, the new 500-kV T/L would turn northeast again parallel and north of the existing T/Ls for approximately 0.5 mile (outside CHSP) before terminating at a new 500-kV gas-insulated switching station located outside of CHSP. The proposed switching station for Route D would be the same size (approximately 5 acres) and in the same location as that proposed for Route B.

3.4.8.1 Direct and Indirect Effects Analysis

The significance criteria used to identify impacts to Biological Resources are introduced in Section 3.4.4.1 (Criteria for Determining Impact Significance). Impacts associated with this alternative are presented below under the applicable significance criterion. Differences in the impacts associated with routing options of Alternative 4 are described as appropriate. If no individual route will result in a significant increase or decrease of impacts to biological resources over other routes, a separate route-specific discussion is not provided.

In general, construction activities would be greater under Alternative 4 because these would be occurring in undeveloped areas; therefore, presumably more roads would need to be widened and added to access the transmission line, staging, and pulling areas. Numerous existing roads likely to be used or improved include Sanome Motorway, and Carbon Canyon Road on the western end of Alt 4, Soquel Canyon Road and Ferree Street along a riparian corridor in the middle, and others such as Telegraph Canyon Road, Bane Canyon Road, and several unnamed dirt roads that cross or run adjacent to riparian areas in Alt 4 ROW. Riparian birds and other riparian obligate species likely use these drainages especially since they are not near human development. Although most of the vegetation in the immediate vicinity of the transmission line is California annual grassland and mixed chaparral, the network of drainages that cross

the Project area contain southern coast live oak riparian forest, southern sycamore alder riparian woodland, southern willow scrub, and southern cottonwood willow riparian habitat.

Impacts to Riparian or Natural Communities (Criterion BIO1)

Impact B-1: Construction activities would result in temporary and permanent losses of native vegetation.

Alternative 4 follows the same route as the proposed Project, but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Alternative 4 traverses similar habitats as the proposed Project but also crosses two new habitats (Mixed Chaparral Recently Burned and Mexican Elderberry/Giant Wild Rye Scrub), and comprises a net increase in the size and magnitude of direct and indirect impacts to native vegetation as a result of increased construction activity in undeveloped areas. These impacts will result in the direct removal of plants during the course of construction, clearing and grading associated with the placement of additional larger towers and the creation of new ROW and expansion of existing ROW, the loss of native seed banks, and changes to the topography and drainage of a site such that the capability of the habitat to support native vegetation is impaired. Furthermore, construction may also facilitate conditions favorable for the establishment of exotic weeds that prevent the establishment of desirable vegetation (see Impact B-3 below). Land disturbance associated with the re-routed portions of this alternative would be approximately 96.9 acres for Route A, 124.5 acres for Route B, 153.5 acres for Route C, 132.7 acres for Route 4C Modified, and 134.1 acres for Route D.~~Construction and removal of towers would impact approximately 25.2 acres for Route A, 44.2 acres for Route B, 60.0 acres for Route C, and 44.2 acres for Route D. It is unknown at this time what acreage of disturbance to vegetation communities would occur due to construction of new roads, staging areas, etc. as final engineering has not been performed for this alternative.~~ However, implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant (Class II).

Impact B-2: The Project would result in the loss of desert wash or riparian habitat.

Alternative 4 traverses similar riparian habitats as the proposed Project, and, compared to the proposed Project, would result in similar types of impacts but comprise a net increase in the size and magnitude of direct and indirect impacts to riparian habitat as a result of increased construction activities in undeveloped areas. These activities include the removal of additional towers, clearing of additional staging and pulling areas, and additional improvements to existing roads as well as construction of new roads that would be necessary for increased construction activities. Direct impacts to desert wash and riparian habitat would include the temporary disturbance and permanent removal of native vegetation within these communities. Indirect impacts to these communities would be similar to those discussed for native vegetation communities (Impact B-1), above. These would include increased sediment transport, alterations to existing topographical and hydrological conditions, fugitive dust accumulation, and the introduction of non-native, invasive plant species. However, implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant (Class II).

Route A. Several streams containing riparian habitat may be affected by the proposed Project but would not be affected by Route A of Alternative 4. In addition to the unnamed streams that would be avoided, the named streams and associated riparian habitat that would no longer be impacted include Little Chino Creek and~~,~~ Chino Creek~~, and Cucamonga Creek~~. However, Route A may affect Aliso Creek and 11 unnamed stream crossings with riparian habitat. No riparian habitat would be impacted by tower placement, but impacts to riparian habitat due to construction of new roads and other disturbances that would be quantified during final engineering could occur. These areas of disturbance are unknown at this time. With implementation of the mitigation measures listed above, impacts to riparian habitat for Alternative 4, Route A, would be less than significant (Class II).

Route B. Several streams containing riparian habitat may be affected by the proposed Project but would not be affected by Route B of Alternative 4. In addition to the unnamed streams that would be avoided, the named streams and associated riparian habitat that would no longer be impacted include Little Chino Creek and~~,~~ Chino Creek~~, and Cucamonga Creek~~. However, Route B may affect Aliso Creek and 19 unnamed stream crossings with riparian habitat. Approximately 0.18~~2~~ acre of riparian habitat would be impacted by tower placement, but impacts to riparian habitat due to construction of new roads and other disturbances that would be quantified during final engineering could also occur. These areas of disturbance are unknown at this time. With implementation of the mitigation measures listed above, impacts to riparian habitat for Alternative 4, Route B, would be less than significant (Class II).

Route C. Several streams containing riparian habitat may be affected by the proposed Project but would not be affected by Route C of Alternative 4. In addition to the unnamed streams that would be avoided, the named streams and associated riparian habitat that would no longer be impacted include Little Chino Creek and~~,~~ Chino Creek~~, and Cucamonga Creek~~. However, Route C may affect Aliso Creek and 10 new unnamed stream crossings with riparian habitat. Approximately 1.~~1~~ 08 acre of riparian habitat would be impacted by tower placement, but impacts to riparian habitat due to construction of new roads and other disturbances that would be quantified during final engineering could also occur. These areas of disturbance are unknown at this time. With implementation of the mitigation measures listed above, impacts to riparian habitat for Alternative 4, Route C, would be less than significant (Class II).

Route C Modified. Several streams containing riparian habitat may be affected by the proposed Project but would not be affected by Route C Modified of Alternative 4. In addition to the unnamed streams that would be avoided, the named streams and associated riparian habitat that would no longer be impacted include Little Chino Creek and Chino Creek. However, Route C Modified may affect 12 new unnamed stream crossings potentially supporting riparian habitat. No riparian habitat would be impacted by tower placement, but impacts to riparian habitat due to construction of new roads and other disturbances that would be quantified during final engineering could also occur. These areas of disturbance are unknown at this time. With implementation of the mitigation measures listed above, impacts to riparian habitat for Alternative 4, Route C Modified, would be less than significant (Class II).

Route D. Several streams containing riparian habitat may be affected by the proposed Project but would not be affected by Route D of Alternative 4. In addition to the unnamed streams that would be avoided, the named streams and associated riparian habitat that would no longer be impacted include Little Chino Creek and~~,~~ Chino Creek~~, and Cucamonga Creek~~. However, Route D may affect Aliso Creek and 28 new unnamed stream crossings with riparian habitat. Approximately 0.~~8~~ 76 acre of riparian habitat would be impacted by tower placement, but impacts to riparian habitat due to construction of new roads and other disturbances that would be quantified during

final engineering could also occur. These areas of disturbance are unknown at this time. With implementation of the mitigation measures listed above, impacts to riparian habitat for Alternative 4, Route D, would be less than significant (Class II).

Impact B-3: The Project would result in the establishment and spread of noxious weeds.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, Alternative 4 would facilitate a net increase in the establishment and spread of noxious weeds as a result of increased construction activity in undeveloped areas. Activities of the alternative that would facilitate noxious weed establishment include the removal of additional towers, construction of new towers, clearing of additional staging and pulling areas, and additional improvements to existing roads as well as construction of new roads that will be necessary for increased construction activities. The potential introduction or spread of noxious and invasive weeds would occur primarily during construction activities, but this impact would continue during operation and maintenance phases. The introduction of noxious and invasive weeds would be related to ground disturbance from clearing and grading; road maintenance; the use of vehicles, construction equipment, or earth materials contaminated with non-native plant seed; use of straw bales or wattles that contain seeds of non-native plant species; and enhanced public access to the project corridor during and after construction. Additionally, weed seeds stuck to equipment or clothing are often spread to new areas by construction or maintenance personnel. Implementation of Alternative 4 would provide many avenues for new propagules (any part of a plant that may generate a new individual plant) to be carried into areas that previously were isolated from sources of noxious weed seeds. However, implementation of Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), and B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads) would reduce impacts to less than significant (Class II).

Impact B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. This alternative impacts two new habitats (Mixed Chaparral, Recently Burned and Mexican Elderberry/Giant Wild Rye Scrub) and, compared to the proposed Project, would result in similar types of impacts but comprises a net increase in the size and magnitude of direct and indirect impacts to wildlife as a result of increased construction activities in undeveloped areas. These activities include increased clearing, grading, and tower construction in undisturbed portions of CHSP. Direct impacts to wildlife associated with construction of the proposed Project would include mortality from trampling or crushing; increased noise levels due to heavy equipment and helicopter use; increased vehicular and human presence along existing access roads and riparian areas; displacement due to habitat modifications, including vegetation removal, alterations of existing soil conditions; fugitive dust; and increased erosion and sediment transport. Indirect effects to wildlife as a result of the proposed Project include the introduction of non-native, invasive plant species, alterations to existing hydrological conditions, and exposure to contaminants. However, the implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement

an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant (Class II).

Impact B-5: Construction activities conducted during the breeding season would result in the loss of nesting birds and raptors.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. This alternative impacts two new habitats (Mixed Chaparral, Recently Burned and Mexican Elderberry/Giant Wild Rye Scrub) and could potentially result in disturbance to nesting bird species that are restricted to these habitats. Compared to the proposed Project, this alternative would result in similar types of impacts but would result in a net increase in the size and magnitude of direct and indirect impacts to nesting birds associated with increased ground-disturbing activity, including tower pad preparation and construction and grading of new access roads in undeveloped areas of the Chino Hills. Direct impacts to nesting birds or raptors as a result of construction activities for the proposed Project could include the removal or disturbance of vegetation that supports nesting birds, increased noise levels from heavy equipment and helicopter operations, increased human presence, and exposure to fugitive dust. Indirect impacts could include the loss of habitat due to the colonization of noxious weeds and a disruption of breeding activity due to facilitated use of new or improved spur and access roads by the public. These factors could result in the disruption of breeding activity, and subsequent nest failure. However, the implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II).

Impact B-6: The Project would cause the loss of foraging habitat for wildlife.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. As noted in Impact B-1, this alternative impacts two new habitats for wildlife, including Mixed Chaparral, Recently Burned and Mexican Elderberry/Giant Wild Rye Scrub, which could provide suitable foraging habitat for a variety of wildlife species. Compared to the proposed Project, Alternative 4 would result in similar types of impacts but would comprise a net increase in the size and magnitude of direct and indirect impacts as a result of increased ground-disturbing activity, including tower pad preparation and construction and grading of new access roads. Direct impacts would include the permanent removal and temporary disturbance of common and rare vegetation communities utilized as foraging habitat for both common and rare wildlife, fugitive dust, and increased noise levels due to heavy equipment and helicopter operations occurring in these areas. Indirect impacts to foraging habitat could include alterations to existing topographical and hydrological conditions, increased erosion and sediment transport, and the establishment of noxious weed colonies. However, implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), and Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) would reduce impacts to less than significant (Class II).

Impacts to Endangered or Threatened Species, or Proposed or Critical Habitat (Criterion BIO2)

Impact B-7: The Project ~~would~~ could disturb endangered, threatened, or proposed plant species or their habitat.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. This alternative impacts two new habitats (Mixed Chaparral, Recently Burned and Mexican Elderberry/Giant Wild Rye Scrub) that may contain endangered, threatened, or proposed plant species, and, compared to the proposed Project, comprises a net increase in the size and magnitude of direct and indirect impacts as a result of increased ground-disturbing activity in undeveloped areas. Direct impacts to listed plant species could occur from construction activities that remove vegetation, grade soils, or cause sedimentation, including tower pad preparation, clearing helicopter staging areas, and the construction, grading, and widening of new spur roads and existing access roads. Indirect impacts could include the disruption of native seed banks through soil alterations, the accumulation of fugitive dust, increased erosion and sediment transport, and the colonization of non-native, invasive plant species. However, the implementation of Mitigation Measures AQ-1a (Fugitive dust control), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.), and H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) would reduce impacts to endangered, threatened, and proposed plant species to less-than-significant levels (Class II). Take of federally and/or State-listed plant species through direct mortality or the loss of occupied habitat would only be authorized in the context of a Biological Opinion issued by the FWS and/or an Incidental Take Authorization from CDFG.

Impact B-8: The Project ~~would~~ could result in the loss of California red-legged frogs and mountain yellow-legged frogs.

Each route of Alternative 4 would result in the additional loss of undeveloped habitat (including riparian) within the Chino Hills. However, these added impacts would not reduce populations of California red-legged frogs and mountain yellow-legged frogs because this portion of the Project is outside the occupied range of these species. Therefore, impacts to these species associated with this alternative would be identical to the proposed Project. Implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8a (Conduct protocol surveys for California red-legged frogs and implement avoidance measures), and Mitigation Measure B-8b (Conduct biological monitoring) would reduce potential impacts to these species to a less-than-significant level (Class II).

Impact B-9: The Project would result in the loss of arroyo toads.

While Alternative 4 would result in a net increase in the size and magnitude of direct and indirect impacts to wildlife as a result of increased ground-disturbing activity in undeveloped areas, these added impacts would not reduce suitable habitat for the arroyo toad because this portion of the Project is outside the

known range of this species. Therefore, impacts to arroyo toads associated with this alternative would be identical to the proposed Project. APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), and Mitigation Measure B-8b (Conduct biological monitoring) are proposed to offset impacts to this species. These measures include, but are not limited to, avoiding the peak breeding period, the placement of exclusion fencing if animals are present, implementation of a capture and release program, and construction monitoring by authorized biologists. Implementation of these measures would avoid or mitigate take, including loss of habitat, if present, thereby reducing potential impacts to a less-than-significant level (Class II).

Impact B-10: The Project ~~would~~ could result in the loss of desert tortoises.

While Alternative 4 would result in a net increase in the size and magnitude of direct and indirect impacts to wildlife as a result of increased ground-disturbing activity in undeveloped areas, these added impacts would not take place within the range of the desert tortoise and would not result in additional impacts to this species. Therefore, impacts to desert tortoises associated with this alternative would be identical to the proposed Project. Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-10 (Conduct presence or absence surveys for desert tortoise and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid or mitigate effects to this species, including loss of habitat, if present, thereby reducing potential impacts to a less-than-significant level (Class II).

Impact B-11: The Project ~~would~~ could result in mortality of desert tortoises as a result of increased predation by common ravens.

While Alternative 4 would result in a net increase in the size and magnitude of direct and indirect impacts to wildlife as a result of increased ground-disturbing activity in undeveloped areas, these added impacts would not take place within the range of the desert tortoise and would not require mitigation because nest sites for common raven are not expected to increase appreciably as a result of tower construction. Therefore, populations of common ravens, and their predation pressure on the desert tortoise, are not expected to result from additional towers, and impacts would be less than significant (Class III).

Impact B-12: The Project ~~would~~ could result in the loss of special-status fish.

While Alternative 4 would result in a net increase in the size and magnitude of direct and indirect impacts as a result of increased ground-disturbing activity in undeveloped areas, the Santa Ana speckled dace and unarmored threespine stickleback do not occur within the Chino Hills and would not be affected by re-routes associated with Alternative 4. As the distribution of Santa Ana sucker and arroyo chub is limited to the Aliso Creek watershed within Alternative 4, which comprises many seasonal drainages, construction activities associated with Alternative 4 could result in injury or mortality to these species, if present. If special-status fish species are present, direct impacts could include mortality due to crushing by heavy equipment and vehicles and water quality degradation caused by increased sedimentation, erosion, or

accidental chemical spills. Indirect impacts could include loss of suitable breeding and spawning habitat, removal of riparian and aquatic vegetation, and decreased water quality due to sedimentation and erosion. However, implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms) would reduce these impacts to less-than-significant levels (Class II).

Impact B-13: The Project ~~would~~ could result in the loss of Critical Habitat for the Santa Ana Sucker.

Critical habitat for the Santa Ana sucker does not occur in the area of the Alternative 4 re-routes. Therefore, impacts to critical habitat for this species would be exactly the same as described for the proposed Project. Mitigation measures have been identified that would minimize impacts to Santa Ana sucker critical habitat. These measures include Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms). Implementation of these measures would reduce impacts to Santa Ana sucker critical habitat to less than significant (Class II).

Impact B-14: The Project ~~would~~ could result in the loss of California condor.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. This alternative impacts two new habitats and, compared to the proposed Project, would result in similar types of impacts but comprises a net increase in the size and magnitude of direct and indirect impacts associated with additional road grading and tower construction, increased construction debris, litter, leaking equipment, and increased vehicle traffic resulting in road kills. In addition, this alternative would introduce 6.2 (Route A), 9.7 (Route B), 5.7 (Route C), 4.7 (Route 4C Modified), or 9.8 (Route D) miles of new transmission line in and around Chino Hills State Park. However, these impacts would occur outside of the known range of California condor. Therefore, impacts associated with this alternative would be identical to those described for the proposed Project. Implementation of Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-8b (Conduct biological monitoring), and B-14 (Monitor construction in condor habitat and remove trash and micro-trash from the work area daily) would avoid or mitigate take, including the loss of habitat and the potential for micro-trash ingestion, and reduce impacts to this species to less-than-significant levels (Class II). Project actions that result in the take of this species would only be authorized through the context of a Biological Opinion from the FWS.

Electrocutions and/or line collisions as a result of Project implementation are discussed further under Impacts B-20 and B-21.

Impact B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative would result in a net increase in the size and magnitude of direct and indirect impacts to nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat as a result of additional road grading and tower construction immediately adjacent to riparian habitats. Construction and removal of towers would impact no riparian habitat for Routes A or C Modified, and approximately 0.18 acres of riparian habitat for Route B, 1.08 acres for Route C, and 0.76 acres for Route D. It is unknown at this time what acreage of disturbance to vegetation communities would occur due to construction of new roads, staging areas, etc. as final engineering has not been performed for this alternative. Direct impacts to southwestern willow flycatchers, least Bell's vireos, or yellow-billed cuckoos could include disruption of breeding activity due to increased dust, noise, and human presence associated with construction activities, and the loss of habitat due to improvement of access roads and altered hydrology. Indirect impacts include the loss of habitat due to the establishment of noxious weeds and a disruption of breeding activity or the flushing of adult or fledging birds through the use of the new or improved access and spur roads by the public. Increased construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment, which would constitute take. However, implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure B-15 (Conduct protocol surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to these species to less-than-significant levels (Class II).

Impact B-16: The Project would result in the loss of coastal California gnatcatchers.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. There are two recent CNDDB records (1992, 2002) of coastal California gnatcatcher within ~~1.3~~one mile~~s~~ of Alternative 4. Additionally, one individual was observed in Powder Canyon approximately 1,000 feet from the ROW during surveys for the Alternative 4 re-routes. Habitat in the area where the bird was sighted is contiguous with habitat crossed by the re-routes. Compared to the proposed Project, this alternative would result in similar types of impacts but would result in a net increase in the size and magnitude of direct and indirect impacts to coastal California gnatcatchers as a result of additional ground-disturbing activity. Construction impacts include tower pad preparation and assembly and grading of new ROW and access roads within the Chino Hills. The removal of habitat in these areas during the breeding season would likely result in the displacement of breeding birds and the abandonment of active nests. Noise from construction, which would occur in many sections of the Chino Hills, could also adversely affect nesting birds, including gnatcatchers. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment, which would constitute take. However,

implementation of APMs BIO-4 through BIO-6 and Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-16 (Conduct protocol or focused surveys for coastal California gnatcatchers and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II).

Impact B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.

Construction activities, including the installation of permanent structures and/or roads, would result in the loss of critical habitat on Segments 7 and 8. Alternative 4 would result in a similar loss of Coastal Sage Scrub along Segment 8A relative to the proposed Project. Some of this may be occupied habitat for the coastal California gnatcatcher. Take of this federally and State-listed species through loss of occupied habitat and/or modification of designated critical habitat would only be authorized in the context of a Biological Opinion issued by the FWS.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. This alternative approaches within varying distances of critical habitat in the CHSP area, and Routes C and C Modified are~~is~~ located partially within critical habitat. Route C would result in approximately 11 acres of disturbance along 1.9 miles within designated critical habitat. Route C Modified would result in approximately 4.9 acres of disturbance along 1.1 miles within designated critical habitat. Impacts to critical and/or occupied habitat for this species are similar to those described for the proposed Project (Section 3.4.6.1) and implementation of APMs BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measures B-16 and B-17 (Conduct protocol or focused surveys for coastal California gnatcatchers and implement avoidance measures, Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II).

Route A. Route A approaches within 0.3 mile of critical habitat for coastal California gnatcatcher but does not impact critical habitat for this species. This route is within 1.0 mile of a CNDDB (1992) record for coastal California gnatcatcher in CHSP immediately south of Telegraph Canyon. With implementation of the mitigation measures listed above, impacts to coastal California gnatcatcher for Alternative 4, Route A, would be less than significant (Class II).

Route B. Route B approaches within 0.3 mile of critical habitat for coastal California gnatcatcher but does not impact critical habitat for this species. This route is within 1.0 mile of a CNDDB (1992) record for coastal California gnatcatcher in CHSP immediately south of Telegraph Canyon. With implementation of the mitigation measures listed above, impacts to coastal California gnatcatcher for Alternative 4, Route B, would be less than significant (Class II).

Route C. Route C occurs partially within critical habitat for this species. Approximately 1.9 miles of transmission line would occur within critical habitat, and construction/removal of 13 structures would occur resulting in approximately 11.1 acres of disturbance to California gnatcatcher critical habitat. This route is within 1.3 miles of a CNDDB record for coastal California gnatcatcher in CHSP immediately south of Telegraph Canyon. However, with implementation of the mitigation measures listed above, impacts to coastal California gnatcatcher for Alternative 4, Route C, would be less than significant (Class II).

Route C Modified. Route C Modified occurs partially within critical habitat for this species. Approximately 1.1 miles of new transmission line would occur within critical habitat, and construction of four structures would occur resulting in approximately 4.9 acres of disturbance to California gnatcatcher critical habitat. However, approximately 0.9 mile of 500-kV transmission line would be removed from critical habitat. Specifically, three 500-kV structures would be removed, resulting in approximately 0.8 acre of temporary disturbance that would be restored upon completion of line removal activities. This route is within 1.2 miles of a CNDDB record for coastal California gnatcatcher in CHSP immediately south of Telegraph Canyon. However, with implementation of the mitigation measures listed above, impacts to coastal California gnatcatcher for Alternative 4, Route C Modified, would be less than significant (Class II).

Route D. Route D approaches within 0.6 mile of critical habitat for coastal California gnatcatcher but does not impact critical habitat for this species. Route D approaches within 0.4 mile of a CNDDB record (2002) for coastal California gnatcatcher immediately east of Bane Canyon on the edge of CHSP. Another CNDDB record for this species occurs within 1.3 miles of Route D near Telegraph Canyon in CHSP. With implementation of the mitigation measures listed above, impacts to coastal California gnatcatcher for Alternative 4, Route D, would be less than significant (Class II).

Impact B-18: The Project ~~would~~ could disturb nesting Swainson's hawks.

While Alternative 4 would result in a net increase in the size and magnitude of direct and indirect impacts to wildlife as a result of increased ground-disturbing activity in undeveloped areas compared to the proposed Project, these added impacts would not increase disturbance of nesting Swainson's hawks because Alternative 4 is outside of the breeding range for this species. Therefore, impacts to this species are identical to those described for the proposed Project (Section 3.4.6.1) and implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1b (Implement a Worker Environmental Awareness Program), B-18a and B-18b (Conduct pre-construction surveys for Swainson's hawks, Removal of nest trees for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II).

Impact B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. This alternative would result in a net decrease, compared to the proposed Project, in marginal foraging habitat for Swainson's hawks as a result of tower pad assembly, grading of new access roads, and construction of a new switching station within grasslands of the Chino Hills. Therefore, impacts to this species are incrementally greater than those described for the proposed Project (Section 3.4.6.1) but would be reduced to a less-than-significant level (Class II) with the implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-18a (Conduct pre-construction surveys for Swainson's hawks), B-19 (Compensate for loss of foraging habitat for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan).

Impact B-20: The Project ~~would~~ could result in electrocution of State and/or federally protected birds.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. This alternative would result in incremental increases in the frequency of electrocution of State and/or federally protected birds as the

distance of transmission lines that occur within natural habitats are greater along Alternative 4 than the proposed Project. However, implementation of APMs BIO-4 and BIO-9 as part of the proposed Project in accordance with the guidance on raptor protection in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) would occur. Because of the long duration of the construction phase of the proposed Project, APLIC may update the guidelines during this time frame. Therefore, SCE shall use the most recent APLIC guidelines for protection of raptors on power lines. These measures would reduce impacts to less than significant (Class III).

Impact B-21: The Project ~~would~~ could result in collision with overhead wires by State and/or federally protected birds.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. This alternative would result in incremental increases in the frequency of collisions of State and/or federally protected birds as the distance of transmission lines that occur within natural habitats are greater along Alternative 4 than the proposed Project. However, with implementation of APM BIO-9 and the incorporation of raptor safety protection into the project design (i.e. tower/conductor [lines] on NFS lands), impacts to State and/or federally protected birds resulting from transmission line collisions would be less than significant (Class III).

Impact B-22: The Project ~~would~~ could result in disturbance to Mohave ground squirrel.

While Alternative 4 would result in a net increase in the size and magnitude of direct and indirect impacts to wildlife as a result of increased ground-disturbing activity in undeveloped areas, these added impacts would not increase disturbance to Mohave ground squirrel, as suitable habitat is not present for this species within the re-routed portions of Alternative 4. Therefore, impacts to this species are identical to those described for the proposed Project (Section 3.4.6.1) and implementation of APMs BIO-4 through BIO-7 and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measures B-22a (Conduct protocol surveys for Mohave ground squirrels), B-22b (Implement construction monitoring for Mohave ground squirrels), and B-22c (Preserve off-site habitat for the Mohave ground squirrel) would reduce impacts to less-than-significant levels (Class II).

Have a substantial adverse effect on a candidate, Forest Service Sensitive, or special-status species (Criterion BIO3)

Impact B-23: The Project would result in loss of candidate, Forest Service Sensitive, or special-status plant species.

Alternative 4 follows the same route as the proposed Project for all Segments except Segment 8A. This Alternative would result in similar impacts as the proposed Project to candidate, FS Sensitive, or special-status plant species, but comprise a net increase in the size and magnitude of direct and indirect impacts as a result of increased ground-disturbing activity in undeveloped areas. ~~Two~~ Three special-status plant species, Catalina mariposa lily, intermediate mariposa lily, and California walnut, were identified during surveys of the Alternative 4 re-routes. Additional species are known from the area (see Table 3.4-6, Special-Status Plants with the Potential to Occur in the Project Area). Construction-related impacts would occur due to activities including, but not limited to, tower pad preparation and construction areas, tower

removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access and/or spur roads. Direct impacts to special-status plant species would be the same as described for listed plant species (Impact B-7) and may occur in a variety of ways, including the direct removal of plants during the course of construction. Clearing and grading associated with the placement of towers or the grading of access or spur roads may also result in the alteration of soil conditions, including the loss of native seed banks and changes to the topography and drainage of a site such that the capability of the habitat to support special-status species is impaired. Indirect impacts include the creation of conditions that are favorable for the invasion of weedy exotic species that prevent the establishment of desirable vegetation and may adversely affect wildlife. Construction on steep hillsides may also result in off-site sediment transport that may bury rare plants in adjacent habitat or alter soil conditions. Dust from road travel, grading, or other construction activities may also reduce photosynthetic capacity in plants over time or inhibit reproduction by physically coating reproductive structures or excluding insect pollinators. As previously described for vegetation communities, soil disturbance may also result in the spread of invasive plant species. However, implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.), and B-23 (Preserve offsite habitat/management of existing populations of special-status plants) would reduce impacts to less than significant (Class II).

Impact B-24: The Project ~~would~~ could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.

Alternative 4 follows the same route as the proposed Project for all Segments except Segment 8A. Impacts to southwestern pond turtles under each Alternative 4 routing option would be slightly greater in magnitude than under the proposed Project because a greater number of sites potentially occupied by southwestern pond turtles (i.e., perennial or nearly perennial aquatic habitat), including Carbon Canyon, Soquel Canyon, Telegraph Canyon, Aliso Canyon, and Bane Canyon, would be spanned or closely approached during transmission line construction under Alternative 4 than under the proposed Project. Spanning or closely approaching a greater number of sites potentially occupied by these species would increase the likelihood of impacts resulting from injury or mortality and also increase the likelihood of permanent loss of southwestern pond turtle nesting habitat due to permanent structures and/or roads and temporary loss of habitat from construction activities. Construction and removal of towers would impact no riparian habitat for Routes A or C Modified, and approximately 0.18 acres of riparian habitat for Route B, 1.08 acres for Route C, and 0.76 acres for Route D. It is unknown at this time what acreage of disturbance to vegetation communities would occur due to construction of new roads, staging areas, etc. as final engineering has not been performed for this alternative. However, implementation of APMs BIO-1 through BIO-3 and BIO-5 through BIO-7, and Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-24 (Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a

(Implement Construction Fugitive Dust Control Plan) would reduce potential impacts to this species to a less-than-significant level (Class II).

Impact B-25: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.

Alternative 4 follows the same route as the proposed Project for all Segments except Segment 8A. Impacts to two-striped garter snakes and south coast garter snakes under Alternative 4 would be slightly greater in magnitude than under the proposed Project because a greater number of sites potentially occupied by these species (i.e., perennial or nearly perennial aquatic habitat), including Carbon Canyon, Soquel Canyon, Telegraph Canyon, Aliso Canyon, and Bane Canyon, would be spanned or closely approached during transmission line construction under Alternative 4 than under the proposed Project. Spanning or closely approaching a greater number of sites potentially occupied by these species would increase the likelihood of impacts resulting from injury or mortality. Construction and removal of towers would impact no riparian habitat for Routes A or C Modified, and approximately 0.18 acres of riparian habitat for Route B, 1.08 acres for Route C, and 0.76 acres for Route D. It is unknown at this time what acreage of disturbance to vegetation communities would occur due to construction of new roads, staging areas, etc. as final engineering has not been performed for this alternative. However, implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-25 (Conduct focused surveys for the two-striped garter snake and south coast garter snake and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce potential impacts to these species to a less-than-significant level (Class II).

Impact B-26: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, Coast Range newts.

While Alternative 4 would result in a net increase in the size and magnitude of direct and indirect impacts to wildlife as a result of increased ground-disturbing activity in undeveloped areas, these added impacts would not increase injury or mortality of, and loss of habitat for, Coast Range newts, as suitable habitat is not present for this species within Alternative 4. Therefore, impacts are identical to the proposed Project and Implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-26 (Conduct focused surveys for coast range newt and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid injury or mortality to this species, thereby reducing impacts to a less-than-significant level (Class II).

Impact B-27: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.

Alternative 4 follows the same route as the proposed Project for all Segments except Segments 8A and 8C. As described in Section 3.4.6.1, project-related construction activities could result in injury or mortality of 11 terrestrial California Species of Special Concern and FS Sensitive amphibian and reptile species (the special-status terrestrial herpetofauna). A subset of eight of those 11 total species has the potential to be affected under Alternative 4. These species include western spadefoot, San Diego horned lizard, silvery legless lizard, orange-throated whiptail, coastal rosy boa, San Bernardino ringneck snake, coast patch-nosed snake, and northern red diamond rattlesnake.

For the remaining three species (i.e., the San Gabriel Mountains slender salamander, California horned lizard, and San Bernardino mountain kingsnake), which do not occur in the re-routed portions of Alternative 4, impacts are identical to the proposed Project. Impacts to the special-status terrestrial herpetofauna under each of the Alternative 4 routing options would be slightly greater in magnitude than impacts to those species under the proposed Project as a result of construction-related activities including tower pad preparation, tower removal, pulling and tensioning sites, assembly yards, and areas subject to grading for new access and/or spur roads. Individuals of one or more of the special-status terrestrial herpetofauna could be injured or killed during these ground-disturbing project activities in undeveloped upland habitats and in some developed areas throughout Alternative 4. Direct impacts also include being hit by vehicles on access roads; mechanical crushing during tower site preparation, grading of spur roads, and preparation of staging and stringing/pulling locations; fugitive dust; and general disturbance due to increased human activity. Furthermore, implementation of Alternative 4 may result in permanent loss of habitat due to permanent structures and/or roads and temporary loss of habitat from construction activities. Indirect impacts to these species include compaction of soils and the introduction of exotic plant species. However, implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-27 (Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid injury or mortality to these species, thereby reducing impacts to a less-than-significant level (Class II).

Impact B-28: The Project ~~would~~ could disturb wintering mountain plovers.

While Alternative 4 would result in a net increase in the size and magnitude of direct and indirect impacts to wildlife as a result of increased ground-disturbing activity in undeveloped areas, these added impacts would not increase disturbance to wintering mountain plovers as suitable habitat is not present for this species within the Alternative 4 re-routes. Therefore, impacts to wintering mountain plovers resulting from this alternative are identical to the proposed Project and are less than significant (Class III).

Impact B-29: The Project would result in the loss of occupied burrowing owl habitat.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative would result in a net increase in the size and magnitude of direct and indirect impacts to burrowing owl as a result of increased construction activities (additional road grading and tower construction) within suitable habitats of the Chino Hills associated with Alternative 4. Direct impacts to

burrowing owls as a result of construction activities for the proposed Project would include the crushing of burrows, removal or disturbance of vegetation, increased noise levels from heavy equipment and helicopter operations, increased human presence, and exposure to fugitive dust. Indirect impacts could include the loss of habitat due to the colonization of noxious weeds and a disruption of breeding activity due to facilitated use of new or improved spur and access roads by the public. However, implementation of APMs BIO-2 and BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-29 (Implement CDFG protocol for burrowing owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II).

Impact B-30: The Project would result in the loss of occupied California spotted owl habitat.

While Alternative 4 would result in a net increase in the size and magnitude of direct and indirect impacts to wildlife as a result of increased ground-disturbing activity in undeveloped areas, these added impacts would not increase the loss of occupied California spotted owl habitat as suitable habitat for this species (bigcone Douglas fir-canyon oak forest and canyon oak forest) is not present in the Alternative 4 re-routes. Therefore, impacts to this species are identical to those described for the proposed Project (Section 3.4.6.1) and implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II).

Impact B-31: The Project ~~would~~ could disturb nesting California spotted owls.

As stated above, suitable habitat for California spotted owl (bigcone Douglas fir-canyon oak forest and canyon oak forest) is not present in the Alternative 4 re-routes. Therefore, impacts to this species are identical to those described for the proposed Project (Section 3.4.6.1) and implementation of APMs BIO-2 and BIO-4 through BIO-6 and Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II).

Impact B-32: The Project ~~would~~ could disturb nesting avian "species of special concern."

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative will result in a net increase in the size and magnitude of direct and indirect impacts to nesting avian Species of Special Concern as a result of additional road grading and tower construction immediately within and adjacent to undeveloped areas and riparian habitats. ~~Construction and removal of towers would impact~~Land disturbance associated with the re-routed portions of this alternative would be approximately ~~25.15~~ 96.9 acres for Route A, ~~44.16~~ 124.5 acres for Route B, ~~59.96~~ 153.5 acres for Route C, 132.7 acres for Route 4C Modified, and ~~44.23~~ 134.1 acres for Route D. ~~It is unknown at this time what acreage of disturbance to vegetation communities would occur due to construction of new roads, staging areas, etc. as final engineering has not been performed for this alternative.~~ Increased construction activity during the breeding season would likely result in the displacement of breeding birds and the abandonment of active nests. Construction disturbance during the breeding season could result in the

incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment, which would constitute take and violate the MBTA. However, implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce potential impacts to a less-than-significant level (Class II).

Impact B-33: The Project ~~would~~ could result in the mortality of and loss of habitat for, special-status bat species.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, Alternative 4 (particularly Route C) would result in an incremental increase, within the Chino Hills, in the number of impacted acres of roosting habitat identified for these species as a result of additional road grading and tower construction. Direct impacts to these species, if present, include mortality of individuals during construction activities, permanent loss of habitat due to construction of permanent structures (e.g., new towers or access roads) or other construction activities (removal of roosting habitat at pulling and assembly sites), and temporary disturbance during construction (noise, air turbulence, dust, and ground vibrations from helicopters and construction equipment). Bats that forage near the ground, such as the pallid bat, would also be subject to crushing or disturbance by vehicles driving at dusk, dawn, or during the night. The construction and use of access roads could also disturb bats. Construction-related activities, which would generate noise, traffic, dust, and diesel fumes, could result in the direct loss of roosting habitat and subsequent mortality to adult bats or pups if any bats were present in the Alternative 4 area. Indirect effects could include increased traffic, dust, and human presence in the project area that could result in bats abandoning their roosts or maternal colonies. Therefore, SCE shall implement APMs BIO-1, BIO-4, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), AQ-1a (Implement Construction Fugitive Dust Control Plan), B-33a (Maternity colony or hibernaculum surveys for roosting bats), B-33b (Provision of substitute roosting bat habitat), and B-33c (Exclude bats prior to demolition of roosts) to reduce impacts to a less-than-significant level (Class II).

Impact B-34: The Project ~~would~~ could result in transmission line strikes by special-status bat species.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative will result in an incremental increase in the frequency of transmission line strikes by special-status bat species as the distance of transmission lines that occur within natural habitats is greater along Alternative 4 than the proposed Project. Specifically, an additional 6.2 (Route A), 9.7 (Route B), 5.7 (Route C), 4.7 (Route 4C Modified), or 9.8 (Route D) miles of transmission line would occur within and adjacent to Chino Hills State Park. However, given that most bat species can use echolocation to discriminate objects as small as 0.4 to 0.004 inches in size (Vaughan 1986), and the size of guard lines and 500-kV or 220-kV transmission lines are typically equal to or greater than 0.5 inches in diameter (SCE 2007), the frequency of transmission line strikes is expected to be extremely low. Therefore, the number of fatal strikes is still expected to be quite low and insufficient to substantially reduce the number of these species (Class III).

Impact B-35: The Project ~~would~~ could result in mortality of and loss of habitat for, special-status mammals.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. This alternative would result in a net increase in the size and magnitude of direct and indirect impacts to special status mammals as a result of additional ground-disturbing activity, including tower pad preparation and construction and grading of new ROW and access roads in undeveloped areas. These additional impacts would only affect the Northwestern San Diego pocket mouse, Southern grasshopper mouse, and San Diego black-tailed jackrabbit as potential habitat for the other species identified in Section 3.4.6.1 does not occur in the Chino Hills, and impacts to these species would be identical to the proposed Project (see Table 3.4-22). Any potential impacts associated with the implementation of Alternative 4 would be quite small relative to the overall population size and range of these species. However, these animals would still be subject to potential mortality from construction activities. Nonetheless, because habitat for these species is relatively abundant elsewhere, the additional habitat impacted by implementation of Alternative 4 would not substantially reduce available habitat, restrict the range, or cause regional populations to drop below self-sustaining levels. The implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities, Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to special-status mammal species to less-than-significant levels (Class II).

Impact B-36: The Project ~~would~~ could result in mortality of San Diego desert woodrat.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative would result in a net increase in the size and magnitude of direct and indirect impacts to San Diego desert woodrat due to additional ground-disturbing activity, including tower pad preparation and construction and grading of new access roads in the foothills of the Chino Hills. Direct impacts from construction activities would include the mortality of individual San Diego desert woodrats or disturbance (noise, air turbulence, dust, and ground vibrations from helicopters and construction equipment) to occupied desert woodrat nests. Construction and use of access roads would also result in impacts to this species. Indirect impacts to San Diego desert woodrats include the spread of noxious weeds that would degrade habitat quality and alteration of soils. However, implementation of APMs BIO-1 and BIO-4 through BIO-6 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-36 (Conduct focused surveys for San Diego desert woodrats and passively relocate), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) in the areas of suitable habitat, would reduce impacts to less than significant (Class II).

Impact B-37: The Project ~~would~~ could result in mortality of, and loss of habitat for, the ringtail.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative would result in a net increase in the size and magnitude of direct and indirect impacts to

ringtails due to additional ground-disturbing activity, including tower pad preparation and construction and grading of new access roads in the Chino Hills. Direct impacts due to construction activities would include mortality of individual ringtails or disturbance of ringtail maternity dens during the pup-rearing season (1 May to 1 September). The construction and use of access roads in riparian areas could also disturb denning ringtails. Construction noise, dust, human presence, or ground disturbance could result in the abandonment of these nest sites or result in mortality of juvenile animals. Indirect impacts to ringtails could include the spread of noxious weeds that would degrade habitat quality, degradation of water quality due to siltation, and alteration of soils. However, the implementation of APMs BIO-1, BIO-4, and BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-37 (Conduct focused surveys for ringtail and passively relocate during the non-breeding season), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce project impacts to ringtails to a less-than-significant level (Class II).

Impact B-38: The Project ~~would~~ could result in mortality of American badgers.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative would result in a net increase in the size and magnitude of direct and indirect impacts to American badgers due to additional ground-disturbing activity, including tower pad preparation and construction and grading of new access roads within suitable habitat in the Chino Hills. Direct impacts to American badgers include mechanical crushing of individuals or burrows by vehicles and construction equipment, noise, dust, and loss of habitat. Indirect impacts include alteration of soils, such as compaction that could preclude burrowing, and the spread of exotic weeds. However, any potential mortality would be quite small relative to the overall population size and implementation of APMs BIO-1, BIO-4, BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), B-38 (Conduct focused surveys for American badger and passively relocate during the non-breeding season), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II).

Have a substantial adverse effect on federally protected wetlands (Criterion BIO4)

Impact B-39: The Project ~~would~~ could result in the loss of wetland habitats.

Any loss of these habitats associated with the proposed Project or alternatives is significant. Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative would result in a net increase in the size and magnitude of direct and indirect impacts to federally-protected wetlands due to additional road grading, tower construction and removal, and culvert repair. Furthermore, the increased use of wet ford crossings along access roads within the Chino Hills could increase discharges and runoff, adversely affecting federally protected wetlands. Construction and removal of towers would impact no riparian habitat for Routes A or C Modified, and approximately 0.18 acres of riparian habitat for Route B, 1.08 acres for Route C, and 0.76 acres for Route D. It is unknown at this time what acreage of disturbance to wetland habitats would occur due to construction of new roads, staging areas, etc. as final engineering has not been performed for this alternative. If avoidance of jurisdictional waters and wetlands is not possible, implementation of APMs BIO-1 through BIO-7, and

Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce the impacts to federally protected wetlands to less-than-significant levels (Class II).

Interfere substantially with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)

Impact B-40: The Project ~~would~~ could interfere with established bird and bat migratory corridors.

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative will result in an incremental increase in the frequency of collisions as the distance of transmission lines that occur within natural habitats is greater along Alternative 4 than the proposed Project. Specifically, an additional 6.2 (Route A), 9.7 (Route B), 5.7 (Route C), 4.7 (Route 4C Modified), or 9.8 (Route D) miles of transmission line would occur within and adjacent to Chino Hills State Park. However, implementation of APMs BIO-4 and BIO-9 as part of the proposed Project in accordance with the guidance on raptor protection in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) would ensure impacts to bird and bat migratory corridors would be less than significant (Class III).

Impact B-41: Corona noise ~~would~~ could result in disturbance to wildlife.

Corona generates audible noise during operation of transmission lines. The noise is generally characterized as a crackling, hissing, or humming sound and is most noticeable during wet conductor conditions such as rain or fog. Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Implementation of Alternative 4 would increase the length of Segment 8 by an additional 6.2 (Route A), 9.7 (Route B), 5.7 (Route C), 4.7 (Route 4C Modified), or 9.8 (Route D) miles of transmission line within and adjacent to Chino Hills State Park. In addition, the impacted area would be greater in size, and corona noise impacts would be greater in magnitude compared to the proposed Project. However, as the effects of corona noise on wildlife are poorly understood, it is difficult to predict the degree to which the increase in corona noise will impact local wildlife. Corona noise is already present along most of Alternative 4, and while Alternative 4 will result in louder corona noise for most segments and a new source of corona noise for the new segments, wildlife can be expected to have already been exposed and likely habituated to this disturbance. Therefore, implementation of Alternative 4 will not result in substantial impacts due to corona noise. This impact would be less than significant (Class III).

Impact B-42: The Project would result in effects to Management Indicator Species.

The ANF LRMP (USDA 2005) requires forest scale monitoring of habitat status and trend for select Management Indicator Species (MIS) on the ANF. MIS are likely to be subject to various levels of disturbance from implementation of the proposed Project on NFS lands. Because the re-routes associated with Alternative 4 would occur on non-NFS lands, impacts to MIS would be exactly the same as the proposed Project and would be reduced to a less-than-significant level (Class II) with the implementation

of APMs BIO-1 and BIO-4 through BIO-6 and Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), B-8b (Conduct biological monitoring), B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), B-30 (Conduct pre- and during construction nest surveys for spotted owl), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan). Therefore, no additional mitigation measures are required.

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances (Criterion BIO6)

Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative would result in similar impacts to biological resources, but it would comprise a net increase in the size and magnitude of direct and indirect impacts due to increased construction activities in undeveloped areas. However, because of the extensive planning involved in project design, including implementation of APMs BIO-1 through BIO-7, and the mitigation measures described above in Criteria BIO1 through BIO5, Alternative 4 is consistent with the local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the San Bernardino County General Plan and Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act, and impacts related to Criterion BIO6 are identical to the proposed Project (no impact).

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP (Criterion BIO7)

Through Project design and implementation of APMs BIO-1 through BIO-7 and the mitigation measures described in Criteria BIO1 through BIO5, SCE shall ensure consistency with the conservation goals of the WMPHCP. Alternative 4 follows the same route as the proposed Project but deviates to the south at a point approximately two miles east of State Highway 57 along Segment 8A. Compared to the proposed Project, this alternative would result in similar impacts to biological resources, but it would result in a net increase in the size and magnitude of direct and indirect impacts due to increased construction activities in undeveloped areas. However, the Alternative 4 re-routes are located outside of the WMPHCP coverage area, and therefore Alternative 4 would result in identical impacts as the proposed Project (no impact).

3.4.8.2 Cumulative Effects Analysis

This section addresses potential cumulative effects that would occur as a result of implementation of Alternatives 4a-d and 4c Modified (Chino Hills Alternative). This alternative consists of a re-route of existing line within and near CHSP to a proposed switching station and removal of existing lines and towers within and just outside of CHSP. In addition, Segment 8C would not be upgraded. Segment 8B would be upgraded as described under Alternative 2. The remainder of this alternative route (west of MP19.2) would be identical to that of the proposed Project and would, therefore, result in identical impacts as the proposed Project. The re-routed portion of the Alternative 4(A-D, including 4C Modified)

route would require the establishment of a new ROW, and two sets of existing transmission lines and associated towers and pads would be removed. As a result, this alternative traverses similar habitat types as the portion of the proposed Project route to the west. This portion of the proposed Project would also require the same types of construction activities to build, and would result in the same operational capacity as the proposed Project. However, given that a substantial portion occurs in areas that have not been disturbed or developed this alternative's contribution to cumulative impacts would be incrementally greater than that of the proposed Project.

Geographic Extent

Alternative 4 differs from the proposed Project for a section of the proposed route leading to the western portion of San Bernardino County near Ontario. This area is still encompassed by the geographic extent of the cumulative analysis defined for the proposed Project in Section 3.4.6.2. Therefore, the geographic extent of the cumulative analysis for Alternative 4 is exactly the same as that for the proposed Project and would include all of the Northern, Central, and Southern Regions.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 4 are exactly the same as for the proposed Project, as described in Section 3.4.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 4 would be exactly the same as the proposed Project, described in Section 3.4.6.2.

Cumulative Impact Analysis

As described in Section 6.2.4, impacts associated with Alternative 4 would contribute to cumulative impacts ~~be cumulatively considerable~~ if they would have the potential to combine with similar impacts of other past, present, or reasonably foreseeable projects. The minor re-route of the proposed Project transmission line associated with Alternative 4 would not differ significantly from the proposed Project's contribution to cumulative impacts. However, as a greater portion of the Project would be located in undeveloped areas under Alternative 4, this alternative's contribution to cumulative biological impacts would be marginally greater than the proposed Project. This difference would not be substantial, and the significance of cumulative impacts under Alternative 4 would be the same as the significance of cumulative impacts for the proposed Project.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 4 in Section 3.4.8.1 (Direct and Indirect Effects Analysis) would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative significant impacts to a less-than-significant level.

3.4.9 Alternative 5: Partial Underground Alternative

The following section describes impacts of Alternative 5 (Partial Underground Alternative) on Biological Resources, as determined by the significance criteria listed in Section 3.4.4.1. Mitigation measures are introduced where necessary in order to reduce significant impacts to less-than-significant levels. As described in Section 2.5, this alternative would be the same as the proposed Project, with the exception

that the line would be installed underground for approximately four miles through Chino Hills, between MP 21.9 and 25.4 of Segment 8A (3.5 miles). This underground portion would occur underneath the City of Chino Hills and increase the overall impact acreage of Segment 8 by approximately nine acres (seven acres of barren/developed and two acres of California annual grassland). Additionally, a large marshalling yard (estimated to be 20 to 30 acres in size) would be required for the storage of all electrical components and specialized materials associated with the GIL system. The location of the marshalling yard would be established as close to the boring site as possible; however, an exact location has not been identified. Depending on the final location for the marshalling yard, temporary impacts associated with ground disturbance could be potentially significant if the final location were to occur within habitat suitable for special-status plants or wildlife species.

The portion of Segment 8 that would be placed underground for Alternative 5 is situated in an area that is primarily located on developed land within the City of Chino Hills, although the Western Transition Station is located in California annual grassland. Land use on either side of the re-routed segment is characterized as barren/developed. Compared to the proposed Project, with the exception of an additional seven acres of barren/developed and two acres of California annual grassland and the 20 to 30 acres for the marshalling yard that will be impacted by Alternative 5, types of impacts to Biological Resources will be identical (See Section 3.4.6.1).

3.4.9.1 Direct and Indirect Effects Analysis

The significance criteria used to identify impacts to Biological Resources are introduced in Section 3.4.4.1 (Criteria for Determining Impact Significance). Impacts associated with this alternative are presented below under the applicable significance criterion.

Impacts to Riparian or Natural Communities (Criterion BIO1)

Impacts associated with Criterion BIO1 for Alternative 5 would be the same as impacts associated with this criterion for the proposed Project. Although this alternative introduces an underground placement of part of the proposed transmission line in the Southern Region, this section would cross identical habitats as the proposed Project (barren/developed, California annual grassland). Compared to the proposed Project, with the exception of an additional seven acres of barren/developed, two acres of California annual grassland, and potentially up to 30 acres of undetermined ground surface as defined by the final location for the marshalling yard that will be impacted by Alternative 5, impacts to Biological Resources will be identical (See Section 3.4.6.1). The impacts and their associated mitigation measures that fall under Criterion BIO1 are summarized in the following paragraphs. Please see Section 3.4.6.1 (Direct and Indirect Effects Analysis) for a detailed description of these impacts, as they are largely the same as the proposed Project.

Impact B-1: Construction activities would result in temporary and permanent losses of native vegetation.

Construction of Alternative 5 would result in the same impacts to native vegetation as the proposed Project, with the exception of the additional loss of two acres of California grassland habitat, and potentially up to 30 acres of undetermined ground surface as defined by the final location for the marshalling yard. Project-related construction activities would require additional restoration/compensation for additive impacts to this vegetation community or any other vegetation communities potentially impacted due to the final location of the marshalling yard (Mitigation Measure B-1). As described in detail in Section 3.4.6.1, with the exception of agricultural or barren/developed land, construction

activities that result in the disturbance to the plant communities identified above would be considered a significant impact without mitigation (Class II). Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant and no additional mitigation measures are required for this increase in impacted vegetation.

Impact B-2: The Project would result in the loss of desert wash or riparian habitat.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of undetermined ground surface as defined by the final location for the marshalling yard within the Chino Hills. These added impacts will not affect any desert wash or riparian habitat and impacts to these resources would be exactly the same as described for the proposed Project. Implementation of Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant (Class II). No additional mitigation measures are required to minimize impacts to these riparian habitats.

Impact B-3: The Project would result in the establishment and spread of noxious weeds.

Impacts related to noxious weeds for Alternative 5 would be the same as described for the proposed Project for the Northern and Central Regions. Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of undetermined ground surface as defined by the final location for the marshalling yard within the Chino Hills in the Southern Region. These added impacts would marginally increase the potential for establishment and spread of noxious weeds. However, implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), and B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads) would reduce impacts related to noxious weeds to less than significant (Class II). Therefore, no additional mitigation measures are required to minimize impacts due to noxious weeds.

Impact B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.

Alternative 5 would include the same elements as the proposed Project and would result in similar impacts to wildlife. The underground portion of this alternative would include impacts to an additional two acres of California annual grassland and potentially up to 30 acres of undetermined ground surface as defined by the final location for the marshalling yard, which could slightly increase impacts to wildlife over those described for the proposed Project. This alternative would require the implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust

Control Plan). Implementation of these mitigation measures would reduce impacts to less than significant (Class II) and no additional mitigation measures are required to minimize impacts to.

Impact B-5: The Project would result in loss of nesting birds during the breeding season.

Alternative 5 contains exactly the same foraging and nesting habitat for both resident and migratory birds as the proposed Project. However, additional habitat would be disturbed from the underground construction techniques and proposed marshaling yard. Displacement of native birds or raptors during the breeding season would be considered a significant impact without mitigation. To reduce impacts to less-than-significant levels**,** SCE would implement Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan). As described in detail in Section 3.4.6.1, the displacement of most birds during the breeding season would be a violation of the Migratory Bird Treaty Act, but Impact B-5 would be reduced to less-than-significant levels (Class II) with mitigation. No additional mitigation measures are required to minimize impacts to nesting birds.

Impact B-6: The Project would cause the loss of foraging habitat for wildlife.

Alternative 5 would result in the loss of an additional two acres of California annual grassland and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard, which would constitute a slightly greater impact to wildlife foraging habitat compared to the proposed Project. This alternative would require the implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), and Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) to reduce impacts to less-than-significant levels (Class II). No additional mitigation measures are required for this relatively small increase in impacted foraging habitat.

Impacts to Endangered or Threatened Species, or Proposed or Critical Habitat (Criterion BIO2)

Ground-disturbing activity, including tower pad preparation and construction, grading of new access roads, tower removal, and use or improvement of existing access roads has the potential to disturb listed plant and wildlife species. As components of this alternative, additional ground disturbance activities would include tunnel boring, GIL system installation, and the establishment of the temporary marshalling yard. Impacts to listed plant and wildlife species are detailed below. Impacts to individual species would be the same as described for the proposed Project (Section 3.4.6.1).

Impact B-7: The Project ~~would~~ could disturb endangered, threatened, or proposed plant species or their habitat.

Alternative 5 would be subject to the same types of ground-disturbing activity as the proposed Project, with the exception of those components identified above. Ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access and/or spur roads has the potential to disturb the listed plant species described above in Section 3.4.6.1. Although no listed plant species were observed during surveys, there remains the potential that new populations of listed species could potentially

establish in areas where they were not previously observed due to dispersal and/or a change in the existing conditions that could favor some listed species, such as a recent burn. Additionally, as the final location for the marshalling yard has not yet been identified, the location could encompass areas that were not subjected to botanical surveys. As such, the potential remains for listed plant species to occur in the undetermined location of the marshalling yard. Nonetheless, impacts to listed plants, if present, would be identical to those described for the proposed Project as a result of implementation of this alternative. The additional two acres of California annual grassland and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard impacted by Alternative 5 may increase impacts to endangered, threatened, or proposed species or their habitats, if present. Therefore, the implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.) would reduce impacts to endangered, threatened, and proposed plant species to less-than-significant levels (Class II). No additional mitigation measures are required to minimize impacts to these plant species.

Impact B-8: The Project ~~would~~ could result in the loss of California red-legged frogs and Mountain yellow-legged frogs.

Alternative 5 would be identical to the proposed Project in the areas potentially inhabited by these species, and impacts to these species would be identical to those described for the proposed Project (Section 3.4.6.1). The implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8a (Conduct protocol surveys for California red-legged frogs and implement avoidance measures), and Mitigation Measure B-8b (Conduct biological monitoring) would reduce potential impacts to these species a less-than-significant level (Class II). No additional mitigation measures are required to minimize impacts to these amphibians.

Impact B-9: The Project would result in the loss of arroyo toad.

Alternative 5 would be identical to the proposed Project in the areas potentially inhabited by arroyo toad, and impacts to this species would be identical to those described for the proposed Project (Section 3.4.6.1). SCE would be required to implement APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), and Mitigation Measure B-8b (Conduct biological monitoring). Implementation of these measures would avoid or mitigate take, including loss of

habitat, if present, thereby reducing potential impacts to a less-than-significant level (Class II). No additional mitigation measures are required to minimize impacts to this species.

Impact B-10: The Project ~~would~~ could result in the loss of desert tortoise.

Alternative 5 would be identical to the proposed Project in the areas of the Northern Region potentially inhabited by the desert tortoise, and impacts to this species would be identical to those described for the proposed Project (Section 3.4.6.1). These impacts would require implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-10 (Conduct surveys for desert tortoises and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Implementation of these measures would avoid or mitigate effects to this species, including loss of habitat, if present, thereby reducing potential impacts to a less-than-significant level (Class II). No additional mitigation measures are required to minimize impacts to this species.

Impact B-11: The Project ~~would~~ could result in mortality of desert tortoises as a result of increased predation by common ravens.

As with the proposed Project, Alternative 5 would not require mitigation because increases in nest sites for common raven as a result of tower construction are not expected to change. Therefore, populations of common raven and their predation pressure on the desert tortoise are not expected as a result of this alternative, and impacts would be less than significant (Class III). Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts will not take place within the range of the desert tortoise and, therefore, no additional mitigation measures are required to minimize impacts to this species.

Impact B-12: The Project ~~would~~ could result in the loss of special-status fish.

Alternative 5 would occur in Chino Hills in a largely developed and disturbed area, and would not impact any additional waterways that could potentially be inhabited by fish. Therefore, this impact would be exactly the same as that described for the proposed Project (Section 3.4.6.1) and would require implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities),Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), and Mitigation Measure B-8b (Conduct biological monitoring). These measures would reduce impacts to special-status fish to less-than-significant levels (Class II). No additional mitigation measures are required to minimize impacts to these species.

Impact B-13: The Project ~~would~~ could result in the loss of Critical Habitat for the Santa Ana sucker.

Alternative 5 would occur in Chino Hills in a largely developed and disturbed area, and would not impact any additional critical habitat for the Santa Ana sucker. Therefore, impacts to critical habitat for this species would be exactly the same as described for the proposed Project. Mitigation is recommended to reduce impacts to critical habitat for the Santa Ana sucker to less than significant (Class II). These

measures include Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms). No additional mitigation is required.

Impact B-14: The Project ~~would~~ could result in the loss of California condors.

Alternative 5 would be identical to the proposed Project in the areas of the Northern and Central Regions potentially inhabited by California condor, and impacts to this species would be identical to those described for the proposed Project (Section 3.4.6.1). In the Southern Region, potential for transmission line strikes by this species would be slightly lower than the proposed Project as 3.5 miles of transmission line would be placed underground. This alternative would require implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-8b (Conduct biological monitoring), and B-14 (Monitor construction in condor habitat and remove trash and micro-trash from the work area daily) to avoid or mitigate take, including the loss of habitat and the potential for micro-trash ingestion. Implementation of these measures would reduce impacts to this species to less-than-significant levels (Class II).

Electrocutions and/or line collisions as a result of the implementation of Alternative 5 are discussed further under Impacts B-20 and B-21. No additional mitigation measures are required to minimize impacts to this species.

Impact B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.

The underground portion of Alternative 5 would not occur in habitat that would support southwestern willow flycatchers, least Bell's vireos, or yellow-billed cuckoos and therefore impacts to these species would be exactly the same as described for the proposed Project (Section 3.4.6.1). These impacts would require implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure B-15 (Conduct protocol surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). This impact would be considered significant without mitigation (Class II). No additional mitigation measures are required to minimize impacts to these species.

Impact B-16: The Project would result in the loss of coastal California gnatcatchers.

Alternative 5 would result in the additional loss of nine acres and potentially up to an additional 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills, which is within the range of the coastal California gnatcatcher. However, these habitats (barren/developed,

California annual grassland) are not suitable habitats for this species, and, therefore, impacts to this species would be exactly the same as described for the proposed Project (Section 3.4.6.1). Implementation of APMs BIO-4 through BIO-6, Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-16 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). Additional mitigation measures would not be required to eliminate or minimize impacts to the coastal California gnatcatcher.

Impact B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.

Alternative 5 would result in the additional loss of nine acres and potentially up to an additional 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills, which is within the range of the coastal California gnatcatcher. However, these areas are not designated as critical habitat for the coastal California gnatcatcher, and they consist of barren/developed and California annual grassland habitats that are not suitable for this species. Therefore, impacts to this species would be exactly the same as those described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measures B-16 and B-17 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures, Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to reduce impacts to less-than-significant levels (Class II). No additional mitigation measures are required to minimize impacts to the coastal California gnatcatcher.

Impact B-18: The Project ~~would~~ could disturb nesting Swainson's Hawks.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts will not disturb nesting Swainson's hawks as the area containing the underground portion of this alternative is not known to support nesting occurrences for this species. Therefore, impacts to this species would be exactly the same as those described for the proposed Project. Project implementation could result in disturbance that causes Swainson's hawks to abandon their nests or otherwise fail to reproduce, resulting in significant impacts without mitigation. Implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1b (Implement a Worker Environmental Awareness Program), B-18a and B-18b (Conduct pre-construction surveys for Swainson's hawks, Removal of nest trees for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). No additional mitigation measures are required to minimize impacts to this species.

Impact B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.

Loss of foraging habitat for the Swainson's hawk as a result of Project implementation could substantially reduce the habitat available for the species, reduce the number, cause populations to drop below self-sustaining levels, restrict the range, or threaten to eliminate populations. Alternative 5 would result in the additional loss of 7 acres of barren/developed, 2 acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard

within the Chino Hills. These added impacts could reduce foraging habitat for Swainson's hawks; however, implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-18a (Conduct pre-construction surveys for Swainson's hawks), B-19 (Compensate for loss of foraging habitat for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II) and no additional mitigation measures are required to minimize impacts to this species.

Impact B-20: The Project ~~would~~ could result in electrocution of State and/or federally protected birds.

Because implementation of Alternative 5 would decrease the length of conductor lines along Segment 8 by 3.5 miles, the impacted area would be smaller in size, and Impact B-20 would be lower in magnitude than the proposed Project. However, the decrease in the frequency of transmission line electrocutions due to this 3.5 mile reduction of aboveground transmission lines is expected to be quite low, because this area is not located near any established bird migratory corridors or dispersal routes. Therefore, the total number of electrocution events is still expected to be quite low and, as with the Alternative 2, insufficient to substantially reduce the number of State and/or federally protected bird species. SCE would implement APMs BIO-4 and BIO-9 as part of the proposed Project in accordance with the guidance on raptor protection in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). However, because of the long duration of the construction phase of the proposed Project, APLIC may update the guidelines during this time frame. Therefore, SCE shall use the most recent APLIC guidelines for protection of raptors on power lines. Impacts to State and/or federally protected birds resulting from electrocution would be less than significant with APMs incorporated (Class III) and no additional mitigation is required.

Impact B-21: The Project ~~would~~ could result in result in collision with overhead wires by State and/or federally protected birds.

Because implementation of Alternative 5 would decrease the length of conductor lines along Segment 8 by 3.5 miles, the impacted area would be smaller in size, and Impact B-21 would be slightly lower in magnitude than the proposed Project. However, the decrease in the frequency of transmission line strikes due to this 3.5 mile reduction of aboveground transmission lines is expected to be quite low, because this area is not located near any established bird migratory corridors or dispersal routes. Therefore, the total number of collision events with overhead wires is still expected to be quite low and, as with Alternative 2, insufficient to substantially reduce the number of State and/or federally protected bird species. Line collisions as a result of Project implementation will not substantially reduce the number of State and/or federally protected birds, cause populations to drop below self-sustaining levels, restrict the range, or threaten to eliminate populations. However, with implementation of APM BIO-9 and the incorporation of raptor safety protection into the project design (i.e. tower/conductor [lines] on NFS lands) impacts to State and/or federally protected birds resulting from transmission line collisions would be less than significant (Class III). No additional mitigation for Impact B-21 is required for Alternative 5.

Impact B-22: The Project ~~would~~ could result in disturbance to Mohave ground squirrels.

Implementation of Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts will not take place within the range of the Mohave ground squirrel, and, therefore, impacts to

Mohave ground squirrels would be exactly the same as those described for the proposed Project (Section 3.4.6.1). Implementation of APMs BIO-4 through BIO-7, Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measures B-22a (Conduct protocol surveys for Mohave ground squirrels), B-22b (Implement construction monitoring for Mohave ground squirrels), and B-22c (Preserve off-site habitat for the Mohave ground squirrel) would reduce impacts to less-than-significant levels (Class II). No additional mitigation measures are required to minimize impacts to this species.

Have a substantial adverse effect on a candidate, Forest Service Sensitive, or special-status species (Criterion BIO3)

Impact B-23: The Project would result in loss of candidate, Forest Service Sensitive, or special-status plant species.

Alternative 5 would be subject to the same types of ground-disturbing activity as the proposed Project with the exception of those components identified above. Ground-disturbing activity, including, but not limited to, tower pad preparation and construction areas, tower removal sites, pulling and tensioning sites, assembly yards, and areas subject to grading for new access and/or spur roads has the potential to disturb special-status plant species. Additionally, as the final location for the marshalling yard has not yet been identified, the location could encompass areas that were not subjected to botanical surveys. As such, the potential remains for special-status plant species to occur in the undetermined location of the marshalling yard. Nonetheless, impacts to special-status plants, if present, would be identical to those described for the proposed Project as a result of implementation of this alternative. The additional two acres of California annual grassland and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard impacted by Alternative 5 may increase impacts to special-status species or their habitats, if present. As discussed above, effects to these species shall be reduced by the implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.), and B-23 (Preserve offsite habitat/management of existing populations of special-status plants). Mitigation measures for Impact B-23 are sufficient to reduce impacts to candidate, FS Sensitive, or special-status plants to less than significant (Class II). Therefore, no additional mitigation measures are required for these species.

Impact B-24: The Project ~~would~~ could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts would not take place within suitable habitat for southern pond turtles, and, therefore, impacts to this species would be exactly the same as for the proposed Project (see Section 3.4.6.1). As described for the proposed Project, if pond turtles are present, damage or destruction of southwestern pond turtle nesting areas would constitute a significant impact under CEQA without mitigation. Nesting areas are frequently used by

multiple individuals, and suitable nesting habitat can be limited in many areas. Destruction of southwestern pond turtle nesting areas would result in a substantial reduction in numbers of this rare species. However, implementation of APMs BIO-1 through BIO-3 and BIO-5 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-24 (Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would prevent mortality or injury of pond turtles, avoid damage or destruction of nesting areas, and mitigate the loss of nesting habitat, thereby reducing potential impacts to a less-than-significant level (Class II). No additional mitigation measures are required to minimize impacts to this species.

Impact B-25: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts would not take place within suitable habitat for two-striped garter snakes and south coast garter snakes, and, therefore, impacts to these species would be exactly the same as described for the proposed Project. Implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-25 (Conduct focused surveys for the two-striped garter snake and south coast garter snake and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid injury or mortality to these species, thereby reducing potential impacts to a less-than-significant level (Class II). No additional mitigation measures are required to minimize impacts to this species.

Impact B-26: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, Coast Range newts.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts would not take place within suitable habitat for Coast Range newts, and, therefore, impacts to this species would be exactly the same as described for the proposed Project (Section 3.4.6.1). Implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-26 (Conduct focused surveys for coast range newt and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate

compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid injury or mortality to this species, thereby reducing impacts to a less-than-significant level (Class II). No additional mitigation measures are required to minimize impacts to this species.

Impact B-27: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.

Alternative 5 would result in the additional loss of two acres of California annual grassland, which is suitable habitat for the northern red diamond rattlesnake, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard in the Chino Hills. However, this additional impacted acreage is low, and impacts to unique amphibian and reptile species would be slightly greater in magnitude than those described for the proposed Project. Mitigation measures for Impact B-27 are sufficient to minimize impacts to candidate, FS Sensitive, or special-status amphibian and reptile species. Implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-27 (Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce potential impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures are required for these species.

Impact B-28: The Project ~~would~~ could disturb wintering mountain plovers.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts would not take place within suitable habitat for wintering mountain plovers, and, therefore, impacts to this species would be exactly the same as described for the proposed Project. Alternative 5 would not require mitigation for this impact because the total acreage of impacted habitat is small relative to regional availability, and implementation of Alternative 5 would not restrict the range of the species. Therefore, impacts to wintering mountain plovers resulting from construction disturbance are less than significant (Class III).

Impact B-29: The Project would result in loss of occupied burrowing owl habitat.

Alternative 5 would result in the additional loss of two acres of California annual grassland, which is suitable habitat for the burrowing owl, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. Therefore, the loss of occupied burrowing owl habitat would potentially be slightly greater in magnitude than that described for the proposed Project. Implementation of APMs BIO-2 and BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-29 (Implement CDFG protocol for burrowing owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). These mitigation measures are sufficient to minimize impacts to burrowing owl; therefore, no additional mitigation measures are required for this species.

Impact B-30: The Project would result in loss of occupied California spotted owl habitat.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts would not take place within suitable habitat for California spotted owl, and, therefore, impacts to this species would be exactly the same as described for the proposed Project (Section 3.4.6.1). SCE would implement APMs BIO-2 and BIO-4 through BIO-6 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Therefore, impacts to the California spotted owl resulting from loss of occupied habitat are considered less than significant (Class II) with mitigation. No additional mitigation measures are required to minimize impacts to this species.

Impact B-31: The Project ~~would~~ could disturb nesting California spotted owls.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts would not take place within suitable nesting habitat for California spotted owl, and, therefore, impacts to spotted owl habitat would be exactly the same as described for the proposed Project (Section 3.4.6.1). SCE would implement APMs BIO-2 and BIO-4 through BIO-6, Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) that would reduce impacts to less-than-significant levels (Class II). No additional mitigation measures are required to minimize impacts to this species.

Impact B-32: The Project ~~would~~ could disturb nesting avian "species of special concern."

Alternative 5 would result in the additional loss of two acres of California annual grassland, which is suitable nesting habitat for several nesting avian "species of special concern," including grasshopper sparrow and northern harrier. Additionally, up to 30 acres of ground surface within the Chino Hills, as defined by the final location for the marshalling yard, could be temporarily disturbed through implementation of this alternative. Therefore, overall impacts to avian "species of special concern" would be slightly greater than those described for the proposed Project (Section 3.4.6.1). Construction-related disturbance that causes nest abandonment and/or loss of reproductive effort would constitute a significant impact and violate the MBTA. However, implementation of APMs BIO-4 through BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce potential impacts to a less-than-significant level (Class II). These mitigation measures are sufficient to minimize impacts to these species. Therefore, no additional mitigation measures are required for avian "species of special concern."

Impact B-33: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status bat species.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts would not take place within suitable roosting habitat for special-status bat species, and, therefore, impacts to these species are identical to those described for the proposed Project (Section 3.4.6.1). If active hibernacula and maternity roosts cannot be avoided, impacts would be significant. However, implementation of APMs BIO-1, BIO-4, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), AQ-1a (Implement Construction Fugitive Dust Control Plan), B-33a (Maternity colony or hibernaculum surveys for roosting bats), B-33b (Provision of substitute roosting bat habitat), and B-33c (Exclude bats prior to demolition of roosts) would reduce impacts to a less-than-significant level (Class II). No additional mitigation measures are required to minimize impacts to these species.

Impact B-34: The Project ~~would~~ could result in transmission line strikes by special-status bat species.

Because implementation of Alternative 5 would decrease the length of conductor lines along Segment 8 by 3.5 miles, the impacted area would be smaller in size, and Impact B-34 would be slightly lower in magnitude than for the proposed Project. However, the decrease in the frequency of transmission line strikes due to this 3.5-mile reduction of aboveground transmission lines is expected to be quite low, because this area is not located near any established bat migratory corridors or dispersal routes. Therefore, the number of collision events with overhead wires is still expected to be quite low and, as with the proposed Project, insufficient to substantially reduce the number of special-status bat species. SCE would implement APMs BIO-1, BIO-4, and BIO-6 to minimize adverse affects to special-status bats. Line strikes as a result of Project implementation will not substantially reduce the number of special-status bat species, cause their populations to drop below self-sustaining levels, restrict their range, or threaten to eliminate their populations. Therefore, impacts to special-status bat species resulting from transmission line strikes are less than significant (Class III).

Impact B-35: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status mammals.

Alternative 5 will result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat (which is suitable habitat for a variety of special-status mammals), and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. As described for the proposed Project (Section 3.4.6.1), the area of suitable habitat for the Los Angeles pocket mouse, Tehachapi pocket mouse, San Joaquin pocket mouse, Northwestern San Diego pocket mouse, Southern grasshopper mouse, Tulare grasshopper mouse, and San Diego black-tailed jackrabbit potentially impacted by Alternative 5 would be quite small relative to the overall population size and range of these species. Implementation of Alternative 5 would not substantially reduce available habitat; however, these animals would still be subject to potential mortality from construction activities. Therefore, impacts to these species as a result of Project implementation would be slightly greater than those described for the proposed Project. SCE indicates that APM BIO-1 and APM BIO-5 would be implemented, which would include preconstruction clearance surveys and the use of biological monitors

during construction of the proposed Project. In addition, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would be implemented to reduce impacts to less than significant (Class II).

Impact B-36: The Project ~~would~~ could result in mortality of San Diego desert woodrats.

Construction activities associated with Alternative 5 could substantially reduce regional populations of this species in the Chino and Puente Hills. Alternative 5 would result in the additional loss of two acres of California annual grassland and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. As the final location of marshaling yard is not known, impacts to this species may be greater than the proposed Project (Section 3.4.6.1). Impacts to this species as a result of Alternative 5 implementation would be reduced to a less-than-significant level (Class II) with the implementation of APMs BIO-1 and BIO-4 through BIO-6, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-36 (Conduct focused surveys for San Diego desert woodrats and passively relocate), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Additional No additional mitigation measures are required.

Impact B-37: The Project ~~would~~ could result in mortality of and loss of habitat for, the ringtail.

Alternative 5 would result in the additional loss of seven acres of barren/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts will not take place within suitable habitat for ringtails, and, therefore, impacts to this species would be exactly the same as those described for the proposed Project (Section 3.4.6.1). The implementation of APMs BIO-1, BIO-4, and BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-37 (Conduct focused surveys for ringtail and passively relocate during the non-breeding season), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce project impacts to ringtails to a less-than-significant level (Class II). No additional mitigation measures are required to minimize impacts to this species.

Impact B-38: The Project ~~would~~ could result in mortality of American badgers.

Alternative 5 would result in the additional loss of two acres of California annual grassland, which is suitable habitat for the American badger, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard. This would constitute a marginal increase in potential impacts and overall impacts to American badgers would be slightly greater than those described for the proposed Project (Section 3.4.6.1). Construction activities could significantly reduce the number of American badger in the Antelope Valley and Chino and Puente Hills. However, impacts to the American badger would be reduced to a less-than-significant level (Class II) with the implementation of APMs BIO-1, BIO-4, BIO-5, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), Mitigation

Measure B-3a (Prepare and implement a Weed Control Plan), B-38 (Conduct focused surveys for American badger and passively relocate during the non-breeding season), and AQ-1a (Implement Construction Fugitive Dust Control Plan). Mitigation measures for Impact B-38 are sufficient to minimize impacts to this species. Therefore, no additional mitigation measures are required for the American badger.

Have a substantial adverse effect on federally protected wetlands (Criterion BIO4)

Impact B-39: The Project ~~would~~ could result in the loss of wetland habitats.

Alternative 5 will result in the additional loss of seven acres of disturbed/developed, two acres of California annual grassland habitat, and potentially up to 30 acres of ground surface as defined by the final location for the marshalling yard within the Chino Hills. However, these added impacts will not affect any federally protected wetlands, and impacts would be exactly the same as described for the proposed Project (Section 6.1). Any loss of these habitats associated with Alternative 5 is significant. If avoidance of jurisdictional waters and wetlands is not possible, implementation of APMs BIO-1 through BIO-7, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) will reduce the impacts to federally protected wetlands to less-than-significant levels (Class II). Therefore, no additional mitigation measures are required to minimize impacts to these protected habitats.

Interfere substantially with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)

Impact B-40: The Project ~~would~~ could interfere with established bird and bat migratory corridors.

Implementation of Alternative 5 would decrease the length of conductor lines along Segment 8 by 3.5 miles, resulting in a smaller impacted area that would interfere with established bird and bat migratory corridors. However, the reduction of aboveground transmission lines along Segment 8 is expected to have little effect on Impact B-40, because this area is not located near any of the established bird and bat migratory corridors. Therefore, the number of collision and other interference events with overhead wires is still expected to be very similar to the proposed Project and would require implementation of APMs BIO-1, BIO-4, and BIO-6 to minimize interference with established bird and bat migratory corridors. Line strikes as a result of implementation of Alternative 5 would not substantially reduce the numbers of migrating bird or bat species, cause their populations to drop below self-sustaining levels, restrict their range, or threaten to eliminate their populations. Thus, implementation of Alternative 5 would not substantially interfere with established bird or bat migratory corridors, and impacts to migrating bird and bat species would be less than significant (Class III). No additional mitigation for Impact B-40 is required for Alternative 5.

Impact B-41: Corona noise ~~would~~ could result in disturbance to wildlife.

Corona generates audible noise during operation of transmission lines. The noise is generally characterized as a crackling, hissing, or humming sound and is most noticeable during wet conductor

conditions such as rain or fog. Alternative 5 follows the exact same route as the proposed Project but includes an underground portion approximately 3.5 miles in length along Segment 8. Implementation of Alternative 5 would decrease the length of above-ground conductor lines along Segment 8 by 3.5 miles, resulting in a smaller area that would produce corona noise as compared to the proposed Project. In all other areas, impacts would be identical to the proposed Project. However, as the effects of corona noise on wildlife are poorly understood, it is difficult to predict the degree to which the increase in corona noise for the above-ground portions of Alternative 5 or the decrease for the underground portion will impact local wildlife. Corona noise is already present along most of Alternative 5, and while Alternative 5 will result in louder corona noise for most segments and a new source of corona noise for the new segments, wildlife can be expected to have already been exposed and likely habituated to this disturbance. Therefore, implementation of Alternative 5 will not result in substantial impacts due to corona noise. This impact would be less than significant (Class III).

Impact B-42: The Project would result in effects to Management Indicator Species.

The ANF LRMP (USDA 2005) requires forest scale monitoring of habitat status and trend for select Management Indicator Species (MIS) on the ANF. MIS are likely to be subject to various levels of disturbance from implementation of the proposed Project on NFS lands. Because the underground portion associated with Alternative 5 would occur on non-NFS lands, impacts to MIS would be exactly the same as the proposed Project and would be reduced to a less-than-significant level (Class II) with the implementation of APMs BIO-1 and BIO-4 through BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), B-8b (Conduct biological monitoring), B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), B-30 (Conduct pre- and during construction nest surveys for spotted owl), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan). Therefore, no additional mitigation measures are required.

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances (Criterion BIO6)

Because of the extensive planning involved in project design, including implementation of APMs BIO 1 through BIO-7, and the mitigation measures described above in Criteria BIO1 through BIO5, Alternative 5 is consistent with the local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. Therefore, no impact would occur.

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP (Criterion BIO7)

Through Project design and implementation of APMs BIO-1 through BIO-7 and the mitigation measures described in Criteria BIO1 through BIO5, SCE shall ensure consistency with the conservation goals of the WMPHCP. Therefore, no impact would occur.

3.4.9.2 Cumulative Effects Analysis

This section addresses potential cumulative effects that would occur as a result of implementation of Alternative 5 (Partial Underground Alternative). This alternative consists of a 3.5 mile underground re-route of the proposed transmission line. The remainder of this alternative route (north of Segment 8A) would be identical to that of the proposed Project and would, therefore, result in identical impacts as the proposed Project. The re-routed underground portion of the Alternative 5 route follows the same path as the proposed aboveground Project route. As a result, this alternative traverses the same or similar habitat types as the portion of the proposed Project route it is proposed to replace, and additional impacts are limited primarily to barren/developed habitats. Based on the substantial similarity of Alternative 5 to the proposed Project, this alternative's contribution to cumulative impacts would be virtually identical to that of the proposed Project.

Geographic Extent

Alternative 5 only differs from the proposed Project for a short 3.5-mile portion of the proposed route in the City of Chino Hills. This area is still encompassed by the geographic extent of the cumulative analysis defined for Alternative 2 in Section 3.4.6.2. Therefore, the geographic extent of the cumulative analysis for Alternative 5 is exactly the same as that for Alternative 2 and would include all of the Northern, Central, and Southern Regions.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 5 are exactly the same as for Alternative 2, as described in Section 3.4.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 5 would be exactly the same as Alternative 2, described in Section 3.4.6.2.

Cumulative Impact Analysis

As described in Section 3.4.6.2, impacts associated with Alternative 5 would contribute to cumulative impacts~~be cumulatively considerable~~ if they would have the potential to combine with similar impacts of other past, present, or reasonably foreseeable projects. The underground re-route of the proposed Project transmission line associated with Alternative 5 would not differ from the proposed Project's contribution to cumulative impacts and therefore, cumulative impacts of Alternative 5 would be exactly the same as cumulative impacts for Alternative 2.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 5 in Section 3.4.9.1 (Direct and Indirect Effects Analysis) would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level.

3.4.10 Alternative 6: Maximum Helicopter Construction in the ANF Alternative

This section describes impacts of Alternative 6 (Maximum Helicopter Construction in the ANF) on biological resources, as determined by the significance criteria listed in Section 3.4.4.1. Mitigation measures are introduced where necessary in order to reduce significant impacts to less-than-significant levels. Alternative 6 was requested by the FS to reduce ground disturbance associated with new road construction and improvements to existing access roads on the ANF. As described in Section 2.6, this alternative would utilize helicopter construction within the ANF to the maximum extent feasible along Segments 6 and 11.

3.4.10.1 Direct and Indirect Effects Analysis

The significance criteria used to identify impacts to biological resources are introduced in Section 3.4.4.1 (Criteria for Determining Impact Significance). Impacts associated with this alternative are presented below under the applicable significance criterion.

Impacts to Riparian or Natural Communities (Criterion BIO1)

Construction activities associated with Alternative 6 described above and in Section 2.6 would result in a net decrease in size and magnitude of construction impacts to biological resources identified under the proposed Project. The impacts and their associated mitigation measures that fall under Criterion BIO1 are summarized in the following paragraphs.

Impact B-1: Construction activities would result in temporary and permanent losses of native vegetation.

Alternative 6 is identical to the proposed Project in the Northern and Southern Regions. In the Central Region, on NFS lands, this alternative differs from the proposed Project by ~~a net decrease of one helicopter staging area and~~ an approximate 42.5-mile reduction in the amount of access/spur roads that would be improved or created under the proposed Project. Alternative 6 follows the same route as the proposed Project through the ANF, impacting similar habitats, but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of the reduction in permanent impacts associated with this alternative. One additional habitat type, Yellow Pine Forest (Plantation), would be impacted by implementation of this alternative. Construction may also result in the creation of conditions that are favorable for the invasion of weedy exotic species that prevent the establishment of desirable vegetation (See Impact B-3 below).

Overall, as described in Section 2.6.2.2 (Land Disturbance), the type and general location of land disturbance associated with Alternative 6 is expected to be comparable to SCE's proposed Project, although there would be a noticeable reduction in permanent land disturbance as a result of the 42.5-mile reduction in new spur roads/upgrades to existing roads and land disturbance associated with ground-based construction. For SCE's proposed Project (Alternative 2), construction within Segment 6 on the ANF would result in approximately 2.5 acres of temporary disturbance (±15% range of 2.1-2.9 acres) and approximately ~~53.5~~ 52.1 acres of permanent disturbance (±15% range of ~~45.5-61.6~~ 44.3-59.9 acres) associated with new and/or upgraded roads (see Table 2.2-7 at the end of Section 2). Segment 11 within the ANF would result in no acres of temporary and approximately ~~40.9~~ 39.3 acres of permanent disturbance (±15% range of ~~34.7-47.0~~ 33.4-45.2 acres) associated with new and/or upgraded roads (see Table 2.2-6 at the end of Section 2).

Alternative 6 would reduce the amount of new and/or upgraded roads by approximately 42.5 miles within the ANF, which would otherwise be required under SCE's proposed Project. Under Alternative 6, construction within Segment 6 would result in approximately 0.375 ~~5~~ acres of temporary disturbance (±15% range of ~~0.4-0.6~~ 0.31-0.42 acres) and approximately ~~26.2~~ 25.4 acres of permanent disturbance (±15% range of ~~22.2-30.1~~ 21.6-29.2 acres) associated with new and/or upgraded roads (see Table 2.6-4 at the end of Section 2); Segment 11 within the ANF (NFS lands) would result in no acres of temporary and approximately 21.5~~7~~ acres of permanent disturbance (±15% range of ~~18.5-25.0~~ 18.3-24.7 acres) (see Table 2.6-3 at the end of Section 2). Overall, within Segment 6 permanent land disturbance is expected to be reduced by approximately ~~27.3~~ 26.6 acres (~~53.5~~ 56.7 acres vs. ~~26.2~~ 30.1); and in Segment 11 is expected to be reduced by approximately ~~19.2~~ 19.3 acres (~~40.9~~ 63.1 acres vs. ~~21.7~~ 43.8 acres).

Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant (Class II). No further mitigation is required.

Impact B-2: The Project would result in the loss of desert wash or riparian habitat.

As Alternative 6 is identical to the proposed Project in the Northern Region, the amount of desert wash impacted by the alternative in this region is identical to the proposed Project. Similarly, the amount of riparian habitat impacted by this alternative in the Southern Region is also identical to the proposed Project.

Approximately 96 Riparian Conservation Areas (RCAs) occur where the transmission line crosses a stream or drainage. One hundred and seventy-one occur where access or spur roads cross ephemeral, intermittent, or perennial drainages under the proposed Project. While riparian areas are considered on both NFS lands and non-NFS lands, RCAs are defined only for the ANF as required by the ANF LRMP. Of the 267 RCAs that occur on NFS lands, 95 would be subject to impacts under the proposed Project that would be considered other than neutral or beneficial. These impacts would occur from road grading, tree removal, culvert installation, stream diversion or similar impacts. Other than neutral or beneficial effects to these resources is not consistent with FS guidelines and would require the completion of a Forest Plan Amendment.

The single largest impact to RCAs from the proposed Project and alternatives would occur from the widening of the access roads to 16 feet and the construction of new spur roads. Widening of the access roads in some cases would remove riparian vegetation, including mature oak trees, alders, and other riparian trees that occur in RCAs. Under Alternative 6, the number of RCAs that would occur where access or spur roads cross drainages would be reduced to 86, with ~~57~~ 58 being subject to potentially adverse impacts. This would result in a difference of ~~38~~ 37 fewer RCAs impacted under Alternative 6 as compared to the proposed Project.

Alternative 6 follows the same route as the proposed Project through the ANF, impacting similar habitats, but comprising a slight decrease in the size and magnitude of direct and indirect impacts to desert wash and riparian habitat (~~0.57~~ 0.06 acre) as a result of the increased helicopter construction and related decrease in the amount of access road improvements. However, impacts to riparian habitat on the ANF, including RCAs would still occur as a result of necessary access road improvements. Impacts to desert wash and riparian habitat are described in Section 3.4.6, Alternative 2: SCE's Proposed Project. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native

vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant (Class II). No further mitigation is required.

Impact B-3: The Project would result in the establishment and spread of noxious weeds.

Alternative 6 follows the same route as the proposed Project through the ANF, impacting similar habitats~~, but with a net decrease of one helicopter staging area~~. There would ~~also~~ be an approximate 42.5-mile decrease in the amount of access roads used, improved, and constructed under this alternative. This decrease in the construction/use of access/spur roads infers that 42.5 miles of road will not be further impacted by the spread of invasive plants due to construction activity. Spanish broom, a ~~noxious~~ nonnative and invasive weed, was identified at helicopter Sites 9 and 10 that would be used under Alternative 6. Spanish broom was also identified at sites SCE 7 (the same site as Site 9 under Alternative 6) and SCE 5 that would be used under the proposed Project. The potential introduction or spread of noxious and invasive weeds would occur primarily during construction activities, but would also continue to occur during operation and maintenance phases. Similar to the proposed Project, the introduction of noxious and invasive weeds would be related to ground disturbance from clearing and grading; road maintenance; the use of vehicles, construction equipment, or earth materials contaminated with non-native plant seed; use of straw bales or wattles that contain seeds of non-native plant species; and enhanced public access to the project corridor during and after construction. Additionally, equipment or clothing is often contaminated with weed seeds and seeds can be spread by construction or maintenance personnel. Implementation of Alternative 6 would provide many avenues for new propagules (any part of a plant that may generate a new individual plant) to spread into previously isolated areas. However, implementation of Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), and B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads) would reduce impacts to less than significant (Class II). No further mitigation is required.

Impact B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.

Alternative 6 follows the same route as the proposed Project through the ANF~~ with a net decrease of one helicopter staging area~~, impacting identical wildlife species, but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of the reduction in the amount of access roads created or improved, especially in undisturbed portions of the ANF. With the increase in helicopter construction, access road use and improvement would decrease over the proposed Project, but disturbance related to helicopter use, including construction of helicopter staging sites, noise, dust, and vibration, would increase. For example, under the proposed Project approximately 6,633 – 9.339 heavy helicopter trips would occur during construction while approximately 27,423 – 38,335 trips would occur under Alternative 6. As described in Section 3.4.6.1, direct impacts to wildlife, including special-status species, associated with construction of Alternative 6 would include mortality from trampling or crushing; increased noise levels due to heavy equipment and helicopter use; increased vehicular and human presence along existing access roads and riparian areas; displacement due to habitat modifications, including vegetation removal, alterations of existing soil conditions; fugitive dust; and increased erosion and sediment transport. Indirect effects to wildlife as a result of Alternative 6 include the introduction of non-native, invasive plant species, alterations to existing hydrological conditions, and exposure to

contaminants. Additionally, animals may be displaced due to helicopter activities, and the habitat they move into may not support adequate forage or may result in increased competition for resources. Animals that are relocating may have less time to spend mating, foraging, rearing young, etc., and could be at an increased risk for predation. These factors could decrease fitness and survival for displaced animals. However, the implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant (Class II). No further mitigation is required.

Impact B-5: Construction activities conducted during the breeding season would result in the loss of nesting birds or raptors.

Alternative 6 follows the same route as the proposed Project through the ANF ~~with a net decrease of one helicopter staging area~~, impacting identical avian species, but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including an approximate 42.5-mile reduction in access road improvement and creation. However, noise from increased helicopter operation could adversely impact nesting birds to a greater degree than the proposed Project. For example, under the proposed Project approximately 6,633 – 9,339 heavy helicopter trips would occur during construction while approximately 27,423 – 38,335 trips would occur under Alternative 6. The increased use of helicopters for implementation of Alternative 6 would also increase noise, vibration, dust, and air turbulence, and would cause visual disturbance to nesting birds above the levels anticipated for the proposed Project. These factors could result in the disruption of breeding activity, and subsequent nest failure. However, the implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No further mitigation is required.

Impact B-6: The Project would cause the loss of foraging habitat for wildlife.

Alternative 6 follows the same route as the proposed Project through the ANF, impacting similar habitat for wildlife species (including special-status species) with the addition of Yellow Pine Forest, but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including an approximate 42.5-mile reduction in access road improvement and creation. Direct impacts as a result of construction activities associated with Alternative 6 would include the permanent removal and temporary disturbance of common and rare vegetation communities utilized as foraging habitat for wildlife, fugitive dust, and increased noise levels due to heavy equipment and helicopter operations occurring in these areas. These impacts would primarily occur during tower pad preparation; grading for helicopter staging areas; and construction, grading, and widening of new spur roads or existing access roads that would still be needed under this alternative. Indirect impacts to foraging habitat could include alterations to existing topographical and hydrological conditions, increased erosion and sediment transport, and the establishment of noxious weeds. Implementation of Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control

Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), and Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits) would reduce impacts to less than significant (Class II). No further mitigation is required.

Impacts to Endangered or Threatened Species, or Proposed or Critical Habitat (Criterion BIO2)

Impact B-7: The Project ~~would~~ could disturb endangered, threatened, or proposed plant species or their habitat.

Alternative 6 follows the same route as the proposed Project through the ANF ~~with a net decrease of one helicopter staging area~~, impacting similar habitat types, but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of the reduction in new and improved access and spur roads. Overall, within Segment 6 permanent land disturbance is expected to be reduced by approximately 27.3 acres (53.5 acres vs. 26.2); and in Segment 11 is expected to be reduced by approximately 19.2 acres (40.9 acres vs. 21.7 acres). Mt. Gleason Indian Paintbrush, a State Rare and FS Sensitive species, was identified adjacent to helicopter Site 49. ~~In addition, suitable habitat for this species occurs in Site 4, although the species was not detected during surveys.~~ As described in Section 3.4.6.1, direct impacts to listed plant species could occur from construction activities that remove vegetation, grade soils, or cause sedimentation, including tower pad preparation, clearing helicopter staging areas, and the construction, grading, and widening of new spur roads and existing access roads that would still be required under this alternative. Indirect impacts could include the disruption of native seed banks through soil alterations, the accumulation of fugitive dust, increased erosion and sediment transport, and the colonization of non-native, invasive plant species. However, the implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.) would reduce impacts to endangered, threatened, and proposed plant species to less-than-significant levels (Class II). No further mitigation is required.

Impact B-8: The Project ~~would~~ could result in the loss of California red-legged frogs and Mountain yellow-legged frogs.

Alternative 6 follows the same route as the proposed Project through the ANF. However, ~~with a net decrease of one helicopter staging area, impacting fewer habitats suitable for the California red-legged frog and mountain yellow legged frog than the proposed Project. In addition,~~ this alternative would comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including an approximate 42.5-mile reduction in the amount of access roads created or improved. However, access roads to stringing and pulling sites would still be improved or constructed under this alternative. As discussed above in Section 3.4.6.1, the use of wet ford crossings along access roads could increase turbidity and sedimentation at, and downstream of, the crossing. California red-legged frogs may use minor tributaries that would be crossed by construction vehicles, especially as refugia when major waterways are experiencing high rates of flow and when water is present in the tributaries. As described for the proposed Project, direct impacts to the California red-legged frog and mountain yellow-legged frog, if present, could occur from construction activities as a result of mechanical crushing, loss of breeding or basking sites, fugitive dust, and human trampling. Disturbance would be associated with the removal of vegetation and alterations of existing topographical and

hydrological conditions, particularly along drainage crossings and within RCAs. Indirect impacts to these species could include the degradation of water quality, changes in water runoff due to spur road and access road construction or upgrades, increased erosion and sediment transport, and the spread of noxious weeds along riparian areas. However, it is important to note that construction activities in some areas that could potentially support these species, such as the upgrades to the crossing at upper Big Tujunga Creek, use of West Fork Cogswell Road, and use of the road along upper Big Tujunga Creek near Shortcut Station would not occur under this alternative, and would reduce potential impacts when compared to the proposed Project. ~~t~~The implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8a (Conduct protocol surveys for California red-legged frogs and implement avoidance measures), and Mitigation Measure B-8b (Conduct biological monitoring) would reduce potential impacts to these species a less-than-significant level (Class II). No further mitigation is required.

Impact B-9: The Project would result in the loss of arroyo toads.

Alternative 6 follows the same route as the proposed Project through the ANF ~~with a net decrease of one helicopter staging area, impacting less habitat suitable for arroyo toad than the proposed Project~~. ~~In addition~~However, this alternative would comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including an approximate 42.5-mile reduction in the improvement and construction of access roads. Improvement of some access roads in areas supporting or potentially supporting the arroyo toad, including 3N23 (Monte Cristo Creek), 4N18.2 (Lynx Gulch), and 3N27(Edison/Fall Creek) would not occur under this alternative but vehicles such as pick-up trucks may still use these roads for access. However, not improving these roads would greatly decrease potential effects to toads in these areas. ~~However, n~~Noise and disturbance associated with helicopter use can disturb arroyo toads and interfere with breeding. As described for the proposed Project, direct impacts to arroyo toads could occur as a result of crushing from mechanized equipment, temporary disruption of foraging or thermoregulation sites in adjacent upland areas, fugitive dust, or the disruption of egg masses from impacts to water quality. Indirect effects to this species may be caused by the diversion or modification of water flows, increased downstream sediment transport, or the establishment of noxious weeds. However, implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), and Mitigation Measure B-8b (Conduct biological monitoring) would avoid or mitigate take, including loss of habitat, thereby reducing potential impacts to a less-than-significant level (Class II). No further mitigation is required.

Impact B-10: The Project ~~would~~ could result in the loss of desert tortoises.

Alternative 6 is identical to the proposed Project in the Northern Region, where the desert tortoise has the potential to occur. Any added impacts associated with Alternative 6 would not affect suitable habitat for desert tortoises, as suitable habitat is absent for this species within the additional areas affected by this alternative. Therefore, impacts to desert tortoises would be identical to those described for the proposed Project (Section 3.4.6.1). Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-10 (Conduct surveys for desert tortoises and implement avoidance measures), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce potential impacts to a less-than-significant level (Class II). No further mitigation is required.

Impact B-11: The Project ~~would~~ could result in mortality of desert tortoises as a result of increased predation by common ravens.

Increases in nest sites for common raven as a result of tower construction would not change from the proposed Project under this alternative, as Alternative 6 is identical to the proposed Project in the Northern Region. Populations of common raven and their predation pressure on the desert tortoise are not expected to result from additional towers, and impacts are expected to be less than significant. Alternative 6 differs from the proposed Project only on the ANF where suitable habitat for the desert tortoise is absent. Therefore, impacts to this species are identical to those described for the proposed Project (Section 3.4.6.1) and would be less than significant (Class III). No further mitigation is required.

Impact B-12: The Project ~~would~~ could result in the loss of special-status fish.

Alternative 6 would occur in the exact same alignment as Alternative 2. The primary difference in this alternative is the reduction of road use on the ANF from road grading and the development of spur roads. In addition, use of the West Fork Cogswell road, which is located adjacent to the West Fork of the San Gabriel River, would not occur. The West Fork of the San Gabriel River in this area supports Santa Ana sucker, arroyo chub, and Santa Ana speckled dace, as well as critical habitat for the Santa Ana sucker. Alternative 6 would result in a reduction in the amount of heavy road traffic and grading required on many of the Forest System roads. This includes major road grading and upgrades within RCAs and perennial water bodies such as Big Tujunga Creek and portions of the West Fork of the San Gabriel River. Under Alternative 6 the number of stream crossings is reduced from 171 to 86. As described for Alternative 2, road grading will occur in RCAs associated with the San Gabriel River above Cogswell reservoir. ~~Overall this will result in a net decrease in the size and magnitude of direct and indirect impacts as a result of increased ground disturbing activity in undeveloped areas. This alternative would also result in a net decrease of one helicopter staging area when compared to the proposed Project.~~ However, ~~T~~the elimination of the West Fork Cogswell road will result in a net decrease in the size and magnitude of direct and indirect impacts to special-status fish species.

Project-generated runoff ~~could~~ would not result in ~~mortality or sublethal effects~~impacts to ~~all life stages of~~ special-status fish~~es~~ due to the fact that Santa Ana sucker are below the Big Tujunga Reservoir and the Cogswell Reservoir and sedimentation would settle out in the reservoirs and would not impact special-status fish species.~~, though with the implementation of mitigation measures this is not expected to occur.~~ ~~U~~Therefore, under Alternative 6 there would be a decrease in potential impacts to Santa Ana Sucker, arroyo chub, and Santa Ana speckled dace since the West Fork Cogswell Road would not be used. Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native

vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8b (Conduct biological monitoring), and B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms) would reduce these impacts to less than significant levels (Class II). No further mitigation is required.

Impact B-13: The Project ~~would~~ could result in the loss of Critical Habitat for the Santa Ana sucker.

Alternative 6 would occur in the exact same habitat and alignment as Alternative 2. The primary difference in this alternative is the reduction of road use on the ANF from road grading and the development of spur roads. In addition, use of the West Fork Cogswell road, which is located adjacent to critical habitat for the Santa Ana sucker, would not occur. Therefore, Alternative 6 would avoid potential direct effects to critical habitat for this species. Therefore, no impact would occur. ~~Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms and impacts to Santa Ana sucker critical habitat would be less than significant (Class III)~~.

Impact B-14: The Project ~~would~~ could result in the loss of California condor.

Alternative 6 follows the same route as the proposed Project through the ANF ~~with a net decrease of one helicopter staging area~~, resulting in identical types of impacts to the California condor, but comprising a net increase in the size and magnitude of direct and indirect impacts as a result of additional helicopter operation and potential for leaking equipment. There would be a decrease in the amount of access roads improved and/or constructed under this alternative~~, and construction of one less helicopter staging area would occur~~. Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-14 (Monitor construction in condor habitat and remove trash and micro-trash from the work area daily) would reduce impacts to this species, including the loss of habitat and the potential for micro-trash ingestion, to less-than-significant levels (Class II). No further mitigation is required.

Electrocutions and/or line collisions as a result of Project implementation are discussed further under Impacts B-20 and B-21.

Impact B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.

Alternative 6 follows the same route as the proposed Project through the ANF ~~with a net decrease of one helicopter staging area. This alternative~~but would result in decreased impacts to listed riparian birds as compared to the proposed Project as a result of the 42.5-mile reduction in the amount of access and spur road construction. The dense riparian habitat present on the West Fork Cogswell road would not be disturbed under this alternative. Additionally, some roads in areas supporting suitable habitat for listed riparian birds on the ANF, including 3N23 (Monte Cristo Creek), 2N23 (Shortcut Edison), West Fork Cogswell Road, and 3N27 (Edison/Fall Creek), would not be improved under Alternative 6 and therefore would decrease potential impacts to these species on the ANF. However, this alternative is identical to

Alternative 2 in the Southern Region where least Bell's vireo are known to occur, and impacts to this species in this area would be the same as described for Alternative 2. Alternative 6 would comprise a net increase in the size and magnitude of direct and indirect impacts associated with additional helicopter operation immediately adjacent to riparian habitats, although these impacts would be considered short-term and temporary. Construction disturbance related to the remaining access roads, tower pad construction, staging areas, stringing and pulling areas, concrete batch plant locations, and helicopter staging areas located near riparian areas during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment, which would constitute take. However, implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure B-15 (Conduct protocol surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to these species to less-than-significant levels (Class II). No further mitigation is required.

Impact B-16: The Project would result in the loss of coastal California gnatcatchers.

Alternative 6 ~~follows the same route as~~differs from the proposed Project ~~through~~ on the ANF, where this Alternative would result in the maximum number of towers being constructed by helicopter. ~~with a net decrease of one helicopter staging area. This alternative would result in a net decrease in the size and magnitude of direct and indirect impacts as a result of a reduction in the improvement and construction of access roads along the steep slopes at the southern end of the ANF. The removal of habitat in these areas during the breeding season could result in the displacement of breeding birds and the abandonment of active nests, if present. Noise from helicopter operation, which would occur in many sections of the ANF, could also adversely affect nesting birds, including gnatcatchers if present~~. However, coastal California gnatcatchers are not known or expected to occur within the ANF due to a lack of suitable habitat. Impacts to this species in the Southern Region where it is known to occur would be identical to those described for the proposed Project. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment, which would constitute take. However, implementation of APMs BIO-4 through BIO-6 and Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-16 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). No further mitigation is required.

Impact B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.

Alternative 6 follows the same route as the proposed Project through the ANF ~~with a net decrease of one helicopter staging site~~; however, critical and/or known occupied habitat does not exist within the ANF portion of Alternative 6. Therefore, impacts to this species are identical to those described for the proposed Project (Section 3.4.6.1) and implementation of APMs BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measures B-16 and B-17 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance

measures, Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). No further mitigation is required.

Impact B-18: The Project ~~would~~ could disturb nesting Swainson's Hawks.

Alternative 6 is identical to the proposed Project in the Northern Region, where the Swainson's hawk occurs. Any added impacts associated with Alternative 6 would not affect nesting Swainson's hawks, as suitable habitat is absent for this species within the additional areas affected by this alternative. Therefore, impacts to this species are identical to those described for the proposed Project (Section 3.4.6.1) and implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1b (Implement a Worker Environmental Awareness Program), B-18a and B-18b (Conduct pre-construction surveys for Swainson's hawks, Removal of nest trees for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). No further mitigation is required.

Impact B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.

Suitable habitat for the Swainson's hawk does not occur in the Central Region where Alternative 6 deviates from the proposed Project. In the Northern Region, where suitable habitat for this species occurs, this alternative is identical to the proposed Project. Therefore, impacts to this species are identical to those described for the proposed Project (Section 3.4.6.1) and implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-18a (Conduct pre-construction surveys for Swainson's hawks), B-19 (Compensate for loss of foraging habitat for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). No further mitigation is required.

Impact B-20: The Project ~~would~~ could result in electrocution of State and/or federally protected birds.

Alternative 6 differs from the proposed Project in the amount of construction that would be completed via helicopter on NFS lands. However, the towers and lines would be identical to the proposed Project and risk of electrocution of State and/or federally protected birds would be the same as described in Section 3.4.6.1. Therefore, implementation of APMs BIO-4 and BIO-9 would ensure impacts would be less than significant (Class III). No further mitigation is required.

Impact B-21: The Project ~~would~~ could result in ~~result in~~ collision with overhead wires by State and/or federally protected birds.

As the characteristics of the towers and lines that would be constructed under Alternative 6 are identical to the proposed Project, the risk of collision with overhead wires by State and/or federally protected birds would be the same as described for the proposed Project (Section 3.4.6.1). Therefore, implementation of APM BIO-9 would ensure impacts would be less than significant (Class III). No further mitigation is required.

Impact B-22: The Project ~~would~~ could result in disturbance to Mohave ground squirrels.

Alternative 6 differs from the proposed Project in the amount of construction that would be completed via helicopter on NFS lands. This alternative is identical to the proposed Project in the Northern Region,

where the Mohave ground squirrel has the potential to occur. Any added impacts associated with Alternative 6 would not reduce suitable habitat for the Mohave ground squirrel, as suitable habitat is not present for this species within the ANF portion of Alternative 6. Therefore, impacts to this species are identical to those described for the proposed Project (Section 3.4.6.1) and implementation of APMs BIO-4 through BIO-7 and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measures B-22a (Conduct protocol surveys for Mohave ground squirrels), B-22b (Implement construction monitoring for Mohave ground squirrels), and B-22c (Preserve off-site habitat for the Mohave ground squirrel) would reduce impacts to less-than-significant levels (Class II). No further mitigation is required.

Have a substantial adverse effect on a candidate, Forest Service Sensitive, or special-status species (Criterion BIO3)

Impact B-23: The Project would result in loss of candidate, Forest Service Sensitive, or special-status plant species.

Alternative 6 follows the same route as the proposed Project through the ANF ~~with a net decrease of one helicopter staging area~~, impacting similar habitat, but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of a decrease in grading for new access and/or spur roads and improvements to existing access roads. In addition, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. A total of 15 special-status plant occurrences would be avoided under Alternative 6 as a result of this reduction in the use and improvement of access roads. Surveys conducted in July, 2008 detected short-joint beaver tail cactus, a CNPS List 1B.2 and FS Sensitive species, at helicopter Sites 1 and 3. San Gabriel manzanita, also a CNPS List 1B.2 and FS Sensitive species, was detected in Sites 5 and 6 and adjacent to Site 9 (proposed Project site SCE 7). Suitable habitat for San Gabriel manzanita is also present at Site 4. Suitable habitat for Lemmon's syntrichopappus, a CNPS List 4.3 and FS Watch List species, is present in Sites 5 and 6. Plummer's mariposa lily (CNPS List 1B.2, FS Sensitive), is present adjacent to Site 6. An unidentified *Calochortus* sp., which could be a special-status species, was identified in Site 7 (proposed Project helicopter site 6B). Additional surveys conducted in May and June 2009 detected San Gabriel scrub oak at Site 11 and San Gabriel manzanita adjacent to Site 13. In total, 8 helicopter sites support special-status plants on or adjacent to the sites under Alternative 6, while 5 sites support special-status plants under Alternative 2. As described for the proposed Project, direct impacts to special-status plant species would be the same as described for listed plant species (Impact B-7) and may occur in a variety of ways, including the direct removal of plants during the course of construction. Clearing and grading associated with the placement of towers or the grading of access or spur roads may also result in the alteration of soil conditions, including the loss of native seed banks and changes to the topography and drainage of a site such that the capability of the habitat to support special-status species is impaired. Indirect impacts include the creation of conditions that are favorable for the invasion of weedy exotic species that prevent the establishment of desirable vegetation and may adversely affect wildlife. Additional indirect impacts include dust and sediment transport. As previously described for vegetation communities, soil disturbance may also result in the spread of invasive plant species. However, avoidance and implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and

implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants), and B-23 (Preserve offsite habitat/management of existing populations of special-status plants) would reduce impacts to less than significant (Class II). No further mitigation is required.

Impact B-24: The Project ~~would~~ could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.

Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile reduction in the construction/improvement of spur and access roads. In addition, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. This alternative would also restrict use of the Monte Cristo and Lynx Gulch roads and reduce potential effects to over ~~85~~ 84 RCAs. By avoiding these major riparian areas, Alternative 6 would result in identical types of impacts to southwestern pond turtles, but comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of the approximate 42.5-mile reduction in the improvement and construction of access roads and a decrease in impacts to riparian areas. However, as discussed above in Section 3.4.6.1, the use of wet ford crossings along access roads could increase turbidity and sedimentation at and downstream of the crossing. Direct effects to southwestern pond turtle may occur from construction activity as a result of mechanical crushing; loss of nesting, breeding or basking sites; and human trampling. Disturbance would be associated with the removal of vegetation, construction and widening of access and spur roads, excavation of footings, and tower construction adjacent to areas that support this species. Indirect impacts to southwestern pond turtle would include alteration of habitat that would preclude pond turtle use, degradation of water quality over time due to siltation and sedimentation, and the spread of noxious weeds. Implementation of APMs BIO-1 through BIO-3 and BIO-5 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-24 (Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid damage or destruction of nesting areas and mitigate the loss of nesting habitat, thereby reducing potential impacts to a less-than-significant level (Class II). No further mitigation is required.

Impact B-25: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.

Alternative 6 follows the same route as the proposed Project through the ANF ~~with a net decrease of one helicopter staging area~~. In addition, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. This alternative would also restrict use of the Monte Cristo and Lynx Gulch roads and reduce potential effects to over ~~85~~ 84 RCAs. By avoiding these major riparian areas, identical types of impacts to two-striped garter snakes and south coast garter snakes would occur, but this alternative would comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including an approximate 42.5-mile reduction in the amount of access and spur roads

to be constructed or improved. As discussed above in Section 3.4.6.1, direct impacts due to construction activities include mortality or injury of individual two-striped garter snakes and south coast garter snakes as a result of mechanical crushing; loss of nesting, breeding or basking sites; fugitive dust; and human trampling. Indirect effects to these species include degradation of water quality through siltation caused by vehicles using wet ford stream crossings; removal of vegetation; and grading of tower pads, staging areas, helicopter pads, and pulling sites. Other indirect effects include compaction of soils and introduction of exotic plant species. Furthermore, Project implementation may result in loss of habitat due to permanent structures and/or roads and temporary loss of habitat from construction activities. However, implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-25 (Conduct focused surveys for the two-striped garter snake and south coast garter snake and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid injury or mortality to these species, thereby reducing potential impacts to a less-than-significant level (Class II). No further mitigation is required.

Impact B-26: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, Coast Range newts.

Alternative 6 follows the same route as the proposed Project through the ANF. ~~with a net decrease of one helicopter staging area~~. ~~In addition~~However, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. This alternative would also restrict use of the Monte Cristo and Lynx Gulch roads and reduce potential effects to over ~~85~~ 84 RCAs. By avoiding these major riparian areas, Alternative 6 would result in identical types of impacts to Coast Range newts, but comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including an approximate 42.5-mile reduction in the amount of access and spur roads to be constructed or improved. As described above in Section 3.4.6.1, direct impacts to Coast Range newt include mechanical crushing or road kill during construction, human trampling, loss of breeding sites due to water quality degradation, fugitive dust, and loss of foraging habitat. Indirect impacts include degradation of water quality through siltation caused by vehicles using wet ford stream crossings; removal of vegetation; and grading tower pads, staging areas, helicopter pads, and pulling sites. Other indirect effects include compaction of soils and introduction of exotic plant species. However, implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-26 (Conduct focused surveys for coast range newt and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid injury or mortality to this species, thereby reducing impacts to a less-than-significant level (Class II). No further mitigation is required.

Impact B-27: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species (special-status terrestrial herpetofauna).

Alternative 6 follows the same route as the proposed Project through the ANF. ~~with a net decrease of one helicopter staging area. In addition~~However, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. This alternative would also restrict use of the Monte Cristo and Lynx Gulch roads and reduce potential effects to over ~~85~~ 84 RCAs. By avoiding these major riparian areas, Alternative 6 would result in identical types of impacts to special-status terrestrial herpetofauna as the proposed Project. However, this alternative comprises a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including an approximate 42.5-mile reduction in the amount of access and spur roads to be constructed or improved. The San Diego horned lizard, a California Species of Special Concern and FS Sensitive species, was identified in helicopter Site 6. As described in Section 3.4.6.1, direct impacts include being hit by vehicles on access roads; mechanical crushing during tower site preparation, grading of spur roads, and preparation of staging and stringing/pulling locations; fugitive dust; and general disturbance due to increased human activity. Furthermore, implementation of this alternative may result in permanent loss of habitat due to permanent structures and/or roads and temporary loss of habitat from construction activities. Individuals of one or more of the special-status terrestrial herpetofauna could be injured or killed during ground-disturbing activities in undeveloped upland habitats and in some developed areas throughout Alternative 6. Indirect impacts to these species include compaction of soils and the introduction of exotic plant species. However, implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-27 (Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No further mitigation is required.

Impact B-28: The Project ~~would~~ could disturb wintering mountain plovers.

Alternative 6 is identical to the proposed Project in the Northern Region where mountain plovers have the potential to occur, and differs from the proposed Project only on the ANF where suitable habitat for this species does not occur. As with the proposed Project, the total acreage of wintering mountain plover habitat impacted by Alternative 6 is small relative to regional availability, and implementation of Alternative 6 would not restrict the range of the species. Therefore, impacts to wintering mountain plovers resulting from this alternative are identical to the proposed Project, and are less than significant (Class III).

Impact B-29: The Project would result in the loss of occupied burrowing owl habitat.

Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile reduction in the amount of spur and access roads constructed/upgraded. This alternative would impact similar habitats, but comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including a reduction in the amount of access and spur roads to be constructed or improved immediately adjacent to the northern boundary of the ANF where burrowing owls have the potential to occur. As described in Section 3.4.6.1, direct impacts to burrowing owls as a result of construction activities for

Alternative 6 would include the crushing of burrows, removal or disturbance of vegetation, increased noise levels from heavy equipment and helicopter operations, increased human presence, and exposure to fugitive dust. Indirect impacts could include the loss of habitat due to the colonization of noxious weeds and a disruption of breeding activity due to facilitated use of new or improved spur and access roads by the public. However, implementation of APMs BIO-2 and BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-29 (Implement CDFG protocol for burrowing owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No further mitigation is required.

Impact B-30: The Project would result in the loss of occupied California spotted owl habitat.

Alternative 6 follows the same route as the proposed Project through the ANF, impacting identical habitats suitable for California spotted owl (bigcone Douglas fir-canyon oak forest and canyon oak forest), but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of the 42.5-mile decrease in access and spur road construction. Suitable habitat for spotted owl is located at several locations, including between the helipad and the tower alignment at Sites 4 and 7. In addition, a California spotted owl was detected by AMEC during 2008 surveys within the PAC that encompasses Site 4. Increased helicopter construction would introduce a substantial increase in the amount of noise, vibration, dust, visual disturbance, and air turbulence in California spotted owl habitat. These factors could disrupt breeding activity and ultimately lead to avoidance of breeding altogether, or the failure of an already established nest. Since a limited operating period will be utilized to protect breeding and nesting, the impacts will be reduced. In addition, there would be a decrease in the disturbance to spotted owl habitat related to road improvement and construction in areas that would be constructed by helicopter. Nonetheless, increased noise and human disturbance impacts to spotted owls as a result of Alternative 6 may result in displacement from territories, interference with breeding, and abandonment of nests. However, implementation of APMs BIO-2 and BIO-4 through BIO-6 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No further mitigation is required.

Impact B-31: The Project ~~would~~ could disturb nesting California spotted owls.

As stated above, Alternative 6 would result in a net decrease in direct and indirect impacts to habitats suitable for California spotted owl (bigcone Douglas fir-canyon oak forest and canyon oak forest) due to the 42.5-mile reduction in the construction/improvement of access and spur roads. Increased helicopter construction activity during the breeding season would likely result in the displacement of breeding California spotted owls and the abandonment of active nests. A limited operating period will be in place to protect breeding and nesting spotted owls, thus the impact would be reduced. In addition, some of the spotted owl habitat on the ANF would not be included in the maximum helicopter construction portion of this alternative, and spotted owls would be subject to construction disturbance from the widening and creation of new access roads as well as stringing and pulling sites, concrete batch plant sites, tower construction and demolition, etc. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment, which would constitute take and violate the MBTA. However, implementation of APMs BIO-2 and BIO-4 through BIO-6,

Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl [including LOPs]), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No further mitigation is required.

Impact B-32: The Project ~~would~~ could disturb nesting avian "species of special concern."

Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile reduction in the construction/improvement of access and spur roads. In addition, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. This alternative would also restrict use of the Monte Cristo and Lynx Gulch roads and reduce potential effects to over ~~85~~ 84 RCAs. This alternative would result in identical types of impacts to avian "species of special concern" as described for the proposed Project (Section 3.4.6.1), but would comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity. A yellow-breasted chat (California Species of Special Concern) was detected in Site 6 during July 2008 surveys. Increased construction activity during the breeding season would likely result in the displacement of breeding birds and the abandonment of active nests. Noise from increased helicopter operation, which would occur in many sections of the ANF as a result of Alternative 6, would also adversely affect nesting birds. Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment, which would constitute take and violate the MBTA. However, implementation of APMs BIO-4 through BIO-6, and Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce potential impacts to a less-than-significant level (Class II). No further mitigation is required.

Impact B-33: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status bat species.

Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile decrease in the amount of access and spur roads constructed and improved. In addition, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. This alternative would also restrict use of the Monte Cristo and Lynx Gulch roads and reduce potential effects to over ~~85~~ 84 RCAs. By avoiding these major riparian areas, Alternative 6 would result in identical types of impacts to special-status bat species as described for the proposed Project (Section 3.4.6.1). However, this alternative would comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity. Townsend's big-eared bat and pallid bat (both California Species of Special Concern and FS Sensitive species), were detected during the July 2008 reconnaissance surveys. Townsend's big-eared bat was detected in helicopter Site 7, and pallid bat was identified adjacent to Site 3 under a bridge, although suitable habitat for this species does not occur within Site 3. Increased construction activity in the vicinity of active hibernacula and maternity roosts would likely result in the displacement of bats and the abandonment of these sites. Furthermore, noise from increased helicopter operation, which would occur in many sections of the ANF as a result of Alternative 6, would also adversely affect special-status bats. As described in Section 3.4.6.1, direct

impacts to these species include mortality of individuals during construction activities, permanent loss of habitat due to construction of permanent structures (e.g., new towers or access roads) or other construction activities (removal of roosting habitat at pulling and assembly sites), and temporary disturbance during construction (noise, air turbulence, dust, and ground vibrations from helicopters and construction equipment). Bats that forage near the ground, such as the pallid bat, would also be subject to crushing or disturbance by vehicles driving at dusk, dawn, or during the night. Construction-related activities, which would generate noise, traffic, dust, and diesel fumes, could result in the direct loss of roosting habitat and subsequent mortality to adult bats or pups if any bats were present in the proposed Project area. Indirect effects could include increased traffic, dust, and human presence in the Project area that could result in bats abandoning their roosts or maternal colonies. However, implementation of APMs BIO-1, BIO-4, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), AQ-1a (Implement Construction Fugitive Dust Control Plan), B-33a (Maternity colony or hibernaculum surveys for roosting bats), B-33b (Provision of substitute roosting bat habitat), and B-33c (Exclude bats prior to demolition of roosts) would reduce impacts to a less-than-significant level (Class II). No further mitigation is required.

Impact B-34: The Project ~~would~~ could result in transmission line strikes by special-status bat species.

As the characteristics of the towers and lines that would be constructed under Alternative 6 are identical to the proposed Project, the risk of collision with overhead wires by special-status bat species would be the same as described for the proposed Project (Section 3.4.6.1). Because most bat species can use echolocation to discriminate objects as small as 0.4 to 0.004 inches in size (Vaughan, 1986), and the size of guard lines and 500-kV or 220-kV transmission lines are typically equal to or greater than 0.5 inches in diameter (SCE, 2007), the frequency of transmission line strikes is expected to be extremely low. Therefore, impacts associated with Alternative 6 are identical to the proposed Project and are less than significant (Class III).

Impact B-35: The Project ~~would~~ could result in mortality of and loss of habitat for, special-status mammals.

Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile reduction in the construction and improvement of access and spur roads, resulting in a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity. This reduction in impacts would only affect the Los Angeles pocket mouse and San Diego black-tailed jackrabbit as potential habitat for the other species identified in Section 3.4.6.1 does not occur on the ANF and impacts to these species would be identical to the proposed Project (see Table 3.4-22). Any potential mortality associated with the implementation of Alternative 6 would be quite small relative to the overall population size and range of these species. Furthermore, because habitat for these species is limited in the ANF, and relatively abundant elsewhere, the habitat impacted by implementation of Alternative 6 would not substantially reduce available habitat, restrict the range, or cause regional populations to drop below self-sustaining levels. Implementation of APM BIO-1 and APM BIO-5 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measure AQ-1a (Implement Construction Fugitive

Dust Control Plan) would minimize impacts to special-status mammal species. Therefore, impacts to these species as a result of implementation of Alternative 6 would be less than significant with mitigation incorporated (Class II).

Impact B-36: The Project ~~would~~ could result in mortality of San Diego desert woodrats.

Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile reduction in the amount of access and spur roads that would be constructed or improved, resulting in a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity. As described in Section 3.4.6.1, direct impacts from construction activities would include the mortality of individual San Diego desert woodrats or disturbance (noise, air turbulence, dust, and ground vibrations from helicopters and construction equipment) to occupied desert woodrat nests. Construction and use of access roads would also result in impacts to this species. Indirect impacts to San Diego desert woodrats include the spread of noxious weeds that would degrade habitat quality and alteration of soils. However, implementation of APMs BIO-1 and BIO-4 through BIO-6, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-36 (Conduct focused surveys for San Diego desert woodrats and passively relocate), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) in the areas of suitable habitat would reduce impacts to less than significant (Class II). No further mitigation is required.

Impact B-37: The Project ~~would~~ could result in mortality of and loss of habitat for, the ringtail.

Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile reduction in the amount of access and spur roads that would be constructed and improved. In addition, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. This alternative would also restrict use of the Monte Cristo and Lynx Gulch roads and reduce potential effects to over ~~85~~ 84 RCAs. Alternative 6 would result in a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity. As described in Section 3.4.6.1, direct impacts due to construction activities would include mortality of individual ringtails or disturbance of ringtail maternity dens during the pup-rearing season (1 May to 1 September). The construction and use of access roads in riparian areas could also disturb denning ringtails. Construction noise, dust, human presence, or ground disturbance could result in the abandonment of these nest sites or result in mortality of juvenile animals. Indirect impacts to ringtail could include the spread of noxious weeds that would degrade habitat quality, degradation of water quality due to siltation, and alteration of soils. However, the implementation of APMs BIO-1, BIO-4, and BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-37 (Conduct focused surveys for ringtail and passively relocate during the non-breeding season), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan), would reduce impacts to ringtails to a less-than-significant level (Class II). No further mitigation is required.

Impact B-38: The Project ~~would~~ could result in mortality of American badgers.

Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile reduction in the construction and improvement of access and spur roads. This alternative would result in identical types of impacts to badgers, but comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity. As described in Section 3.4.6.1, direct impacts to American badger include mechanical crushing of individuals or burrows by vehicles and construction equipment, noise, dust, and loss of habitat. Indirect impacts include alteration of soils, such as compaction that could preclude burrowing, and the spread of exotic weeds. However, any potential mortality would be quite small relative to the overall population size of the American badger and this species has not been recently observed on the ANF. Implementation of APMs BIO-1, BIO-4, BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), B-38 (Conduct focused surveys for American badger and passively relocate during the non-breeding season), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No further mitigation is required.

Have a substantial adverse effect on federally protected wetlands (Criterion BIO4)

Impact B-39: The Project ~~would~~ could result in the loss of wetland habitats.

Any loss of these habitats associated with the proposed Project or alternatives is significant. Alternative 6 follows the same route as the proposed Project through the ANF with ~~a net decrease of one helicopter staging area and~~ a 42.5-mile reduction in the construction and improvement of access and spur roads. In addition, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. This alternative would also restrict use of the Monte Cristo and Lynx Gulch roads and reduce potential effects to over ~~85~~ 84 RCAs. By avoiding these major riparian areas, Alternative 6 would result in the identical types of impacts to federally protected wetlands, but comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity. Helicopter staging areas associated with this alternative would be located in upland areas away from wetlands. However, improvements to remaining access roads and construction of towers may impact wetland habitats. If avoidance of jurisdictional waters and wetlands is not possible, implementation of APMs BIO-1 through BIO-7, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce the impacts to federally protected wetlands to less-than-significant levels (Class II). No further mitigation is required.

Interfere substantially with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)

Impact B-40: The Project ~~would~~ could interfere with established bird and bat migratory corridors.

Alternative 6 follows the same route as the proposed Project, and consists of the same tower and transmission line characteristics, resulting in identical impacts to bird and bat migratory corridors. Implementation of APM BIO-9 as part of the proposed Project would ensure this impact would be less than significant (Class III). No further mitigation is required.

Impact B-41: Corona noise ~~would~~ could result in disturbance to wildlife.

Corona generates audible noise during operation of transmission lines. The noise is generally characterized as a crackling, hissing, or humming sound and is most noticeable during wet conductor conditions such as rain or fog. Alternative 6 follows the exact same route as the proposed Project and includes the same components along Segments 6 and 11 through the ANF. Implementation of Alternative 6 would result in exactly the same impacts related to corona noise as the proposed Project. As the effects of corona noise on wildlife are poorly understood, it is difficult to predict the degree to which the increase in corona noise of Alternative 6 would impact local wildlife. Corona noise is already present along most of Alternative 6, including in the ANF at levels ranging from less than 20 dBA to 51 dBA (see Table 3.10-3, of Section 3.10, Noise), and while Alternative 6 would result in louder corona noise for most segments at levels ranging from 22 to 60 dBA (see Table 3.10-5, of Section 3.10, Noise), and a new source of corona noise for the new segments, wildlife can be expected to have already been exposed and likely habituated to this disturbance. Therefore, implementation of Alternative 6 would not result in substantial impacts to wildlife due to corona noise. This impact would be less than significant (Class III).

Impact B-42: The Project would result in effects to Management Indicator Species.

Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile reduction in the construction and improvement of access and spur roads. In addition, the West Fork Cogswell road which runs adjacent to the West Fork of the San Gabriel River would not be used and the construction of the Big Tujunga River crossing would not occur. This alternative would also restrict use of the Monte Cristo and Lynx Gulch roads and reduce potential effects to over ~~55~~ 84 RCAs. With the implementation of this alternative there may be some temporary increases in noise effects from helicopter use to MIS such as spotted owl, mountain lion, song sparrow, or mule deer; however, these effects would be considered short term. In addition, loss of bigcone Douglas fir habitat would decrease from 6.9 acres under Alternative 2 to 5.2 acres under Alternative 6. However, loss of Coulter pine habitat would increase under this alternative (7.7 acres under Alternative 2 and 10.1 acres under Alternative 6). This alternative would result in a reduction in disturbance to important riparian areas where many MIS are known to occur. Implementation of APMs BIO-1 through BIO-7 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), B-8b (Conduct biological monitoring), B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), B-30 (Conduct pre- and during construction nest surveys for

spotted owl), AQ-1a (Implement Construction Fugitive Dust Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and H-1b (Dry weather construction) would reduce impacts to less than significant (Class II). No further mitigation is required.

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (Criterion BIO6)

Alternative 6 follows the same route as the proposed Project through the ANF, resulting in identical impacts to biological resources but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including an approximate 42.5-mile reduction in the amount of access and spur roads to be constructed or improved. However, because of the extensive planning involved in Project design, including implementation of APMs BIO-1 through BIO-7, and the mitigation measures described above in Criteria BIO1 through BIO5, Alternative 6 is consistent with the local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act, and impacts related to Criterion BIO6 are identical to the proposed Project (no impact).

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP (Criterion BIO7)

Through Project design and implementation of APMs BIO-1 through BIO-7 and the mitigation measures described in Criteria BIO1 through BIO5, SCE shall ensure consistency with the conservation goals of the WMPHCP. Alternative 6 follows the same route as the proposed Project through the ANF with a ~~net decrease of one helicopter staging area and a~~ 42.5-mile reduction in the construction and improvement of access and spur roads, resulting in identical types of impacts to biological resources but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity. However, the area where Alternative 6 differs from the proposed Project is located outside of the WMPHCP coverage area and therefore would result in identical impacts as the proposed Project (no impact).

3.4.10.2 Cumulative Effects Analysis

This section addresses potential cumulative effects that would occur as a result of implementation of Alternative 6. In Segments 6 and 11, the maximum number of towers would be constructed via helicopter, and 11 new helicopter staging areas would be constructed (12 helicopter staging areas would be constructed under the proposed Project).

Alternative 6 follows the same route as the proposed Project through the ANF, impacting similar habitats and species, but comprising a net decrease in the size and magnitude of direct and indirect impacts as a result of decreased ground-disturbing activity, including an approximate 42.5-mile reduction in the amount of access and spur roads to be constructed or improved.

Geographic Extent

Alternative 6 only differs from the proposed Project within the ANF. This area is still encompassed by the geographic extent of the cumulative analysis defined for Alternative 2 in Section 3.4.6.2 Therefore, the geographic extent of the cumulative analysis for Alternative 6 is exactly the same as that for Alternative 2 and would include all of the Northern, Central, and Southern Regions.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 6 are exactly the same as for Alternative 2, as described in Section 3.4.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 6 would be exactly the same as Alternative 2, described in Section 3.4.6.2.

Cumulative Impact Analysis

As described in Section 3.4.6.2, impacts associated with Alternative 6 would contribute to cumulative impacts~~be cumulatively considerable~~ if they would have the potential to combine with similar impacts of other past, present, or reasonably foreseeable projects. Cumulative impacts of Alternative 6 would be less than cumulative impacts for Alternative 2, due to a decrease in new road construction and improvement. This is most evident on the ANF where cumulative impacts would be reduced for several special-status species when compared to Alternative 2. However, because of the substantial similarity of Alternative 6 to Alternative 2 over the project as a whole, cumulative impacts would be very similar to those described for Alternative 2, except on the ANF.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 6 in Section 3.4.10.1 (Direct and Indirect Effects Analysis) would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level.

3.4.11 Alternative 7: 66-kV Subtransmission Alternative

The following section describes the impacts of Alternative 7 (66-kV Subtransmission Alternative) on Biological Resources, as determined by the significance criteria listed in Section 3.4.4.1. Mitigation measures are introduced where necessary in order to reduce significant impacts to less-than-significant levels. As described in Section 2.7, this alternative would deviate from the proposed Project along Segment 7, through the Duck Farm Project, where the 66-kV subtransmission line would be routed underground beginning at approximately S7 MP 8.9. The underground segment would extend approximately 6,000 feet, transitioning back to overhead construction at approximately S7 MP 9.9. The underground portion would follow the same route as the proposed Project (Alternative 2). Additionally, Alternative 7 includes a 66-kV underground re-route around the Whittier Narrows Recreation Area in Segment 7 that would exit the ROW at Peck Road and be placed underground. The underground re-route would follow Peck Road to Durfee Road, where it would turn west and continue along Durfee Road for approximately 3,000 feet before rejoining the proposed alignment (Alternative 2) at approximately S7 MP 12.025. A re-route of the overhead 66-kV lines along Segment 7 in Whittier Narrows is also proposed as part of this alternative. This element of Alternative 7 would consist of relocating the existing 66-kV subtransmission line to the north side of the existing 220-kV ROW, requiring a 20-foot expansion of the existing ROW, beginning at Durfee Avenue through Legg Lake Park and the Whittier Narrows Recreation Area to the San Gabriel Junction. Under this re-route, fewer, but taller, 66-kV structures would be required along this portion of the Segment 7 alignment compared to the proposed Project. Alternative 7 also includes two options for a 66-kV re-route of overhead construction along Segment 8A, around Whittier Narrows Recreation Area. The re-route Option 1 would occur from the San Gabriel

Junction, extend along San Gabriel Boulevard to Durfee Avenue, to Siphon Road. This~~e~~ re-route would follow Siphon Road for approximately 2,100 feet before rejoining the ROW just east of the San Gabriel River. A new approximately 1,200-foot ROW would be required to cross from the existing 66-kV ROW on the west side of the San Gabriel River to the 220-kV ROW on the east side of the San Gabriel River, where the re-route would tie back into the Project ROW. Under re-route Option 2, the 66-kV lines would continue west along the north side of Durfee Avenue utilizing new LWSPs, re-entering the existing 220-kV ROW at approximately Segment 8A MP 3.2. The 66-kV lines would continue southeast along the south side of the existing 220-kV ROW up to the east side of the San Gabriel River utilizing new TSPs. A 20-foot expansion of the existing ROW between Segment 8A MP 3.2 and 3.8 would be required to provide adequate clearance for conductor sway between the 66-kV lines and the new double-circuit 500-kV structures within the ROW and allow for one-for-one placement of the 66-kV TSPs alongside the new double-circuit 500-kV structures.

The portion of Segment 7 that would be re-routed underground through the Duck Farm Project for Alternative 7 is situated in an area that is primarily barren/developed, with pockets of ruderal habitat and disturbed annual grassland. The portion of Segment 7 that would be re-routed around the Whittier Narrows Recreation Area traverses barren/developed land and nonnative woodland. The portion of Segment 8A that would be re-routed around the Whittier Narrows Recreation Area consists of coastal sage scrub, barren/developed land, grassland, and several types of riparian vegetation. All the communities in this section support high concentrations of weeds. The Affected Environment along the rest of the Alternative 7 route in the Southern Region is identical to the proposed Project. Furthermore, temporary and permanent ground disturbance as it relates to the re-routed portions of the alternative would amount to only incremental increases in impacts to these additional areas. However, less ground disturbance in Whittier Narrows would occur as a result of this alternative because there would be fewer 66-kV structures constructed in Segment 7, and some of the 66-kV lines would be re-routed around the recreation area.

3.4.11.1 Direct and Indirect Effects Analysis

The significance criteria used to identify impacts to Biological Resources are introduced in Section 3.4.4.1 (Criteria for Determining Impact Significance). Impacts associated with this alternative are presented below under the applicable significance criterion.

Impacts to Riparian or Natural Communities (Criterion BIO1)

Impacts associated with Criterion BIO1 for Alternative 7 would be the same as impacts associated with this criterion for the proposed Project. Although this alternative introduces ~~three~~ four re-routes of part of the 66-kV subtransmission line in the Southern Region, the re-routes would cross identical types of habitats as the proposed Project (coastal sage scrub, barren/developed land, mulefat scrub, nonnative woodland, southern sycamore alder riparian woodland, ruderal grassland, southern arroyo willow riparian forest, southern cottonwood willow riparian forest, southern willow scrub). Temporary and permanent ground disturbance as it relates to the re-routed portion of the alternative would be primarily due to the undergrounding of two of the re-routed portions and the construction of overhead subtransmission line in the vicinity of the Whittier Narrows Recreation Area. New access and spur roads may also be required for the new approximately 1,200 foot ROW for the San Gabriel River crossing within Segment 8A associated with the Whittier Narrows 66-kV overhead re-route Option 1. The impacts and their associated mitigation measures that fall under Criterion BIO1 are summarized in the following paragraphs. Please

see Section 3.4.6.1 (Direct and Indirect Effects Analysis) for a detailed description of these impacts, as they are the same as the proposed Project, and just vary in magnitude.

Impact B-1: Construction activities would result in temporary and permanent losses of native vegetation.

The Alternative 7 re-routes would impact primarily barren/developed areas. However, approximately 82 acres of mulefat scrub, 81 acres of ruderal grassland, and 37 acres of southern sycamore alder riparian woodland occur within the re-routed portions of this alternative, with additional natural communities present as well (see Table 3.4-15). It is unknown at this time what acreage of these and other natural communities present would be affected as final engineering has not been conducted on this alternative. Compared to the proposed Project, there would be additional ~~acreage of~~ native vegetation crossed and impacted by the re-routes ~~would constitute marginally greater impacts under Alternative 7~~. However, there would be fewer structures within Whittier Narrows Recreation Area, equating to less ground disturbance, and the additional areas impacted outside of the ROW under this alternative largely consist of barren/developed areas, ruderal grassland, and non-native woodland. Additionally, the Segment 8A overhead re-route Option 2 would be sited along city streets before entering the existing 200-kV ROW in the Whittier Narrows Recreation Area. Most of Option 1 would be routed along streets and a paved access road that runs along the southern boundary of the Whittier Narrows Recreation Area. Option 1 ~~The underground portions of the Alternative 7 re-routes would traverse barren/developed lands, ruderal grassland, and nonnative woodland. The overhead 66 kV sub-transmission line re-route along Segment 8A~~ would traverse coastal sage scrub, barren/developed lands, ruderal grassland, and various riparian habitats. While these communities generally have a large weed component in the project area; they still provide habitat for wildlife, including several special-status species. As described in detail in Section 3.4.6.1, with the exception of agricultural or barren/developed land, construction activities that result in disturbance to the plant communities identified above would be considered a significant impact without mitigation. Therefore, Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would be implemented to reduce impacts to native vegetation to less than significant (Class II) and no additional mitigation would be required.

Impact B-2: The Project would result in the loss of desert wash or riparian habitat.

Riparian habitat (approximately 14 acres of freshwater marsh, 83 acres of mulefat scrub, 1 acre of ruderal wetland, 3 acres of southern coast live oak riparian forest, 37 acres of southern sycamore alder riparian woodland, 14 acres of southern arroyo willow riparian forest, 21 acres of southern cottonwood willow riparian forest, 4 acres of sparsely vegetated streambed, and 17 acres of southern willow scrub) is present within the Alternative 7 overhead re-route Option 1. Option 2 follows the same route as Option 1 until the intersection of Siphon Road and Durfee Avenue, where Option 2 continues along Durfee Avenue before entering the existing 220-kV ROW at the border to the Whittier Narrows Recreation Area. Impacts to riparian vegetation would be similar to the proposed Project, but would be slightly ~~greater~~ less in magnitude in the Southern Region because of the ~~additional riparian habitats~~decrease in ground disturbance associated with fewer 66-kV subtransmission structures in the existing ROW ~~crossed by the re-routed section of the Segment 8A 66-kV subtransmission line alignment~~in Segment 7 and Segment 8A (Option 2). Option 1 would cross additional riparian areas outside of the existing ROW, but the acreage

and location of disturbance is unknown at this time. The underground portions of this alternative would not impact desert wash or riparian habitats.

Because of the overall loss of desert wash and riparian habitat within California, along with the role these habitats play in providing suitable habitat for several special-status species, the loss of riparian habitat associated with Alternative 7 would be significant without mitigation. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce these impacts to less than significant (Class II) and no additional mitigation would be required.

Impact B-3: The Project would result in the establishment and spread of noxious weeds.

Impacts associated with noxious weeds would be the same as described for the proposed Project in the Northern and Central Regions. Alternative 7 includes one underground 66-kV subtransmission line segment along the proposed Project route in Segment 7, one underground 66-kV subtransmission line re-route along Segment 7, one overhead 66-kV re-route within the existing 220-kV ROW in Segment 7, and ~~one~~ two 66-kV subtransmission line re-route options along Segment 8A that would be overhead construction. These re-routes would generally be within existing ROWs, except for the approximately 1,6~~2~~00-foot section of new ROW that would be required for the Segment 8A re-route Option 1 and the underground section of Segment 7 around the Whittier Narrows Recreation Area. The new ROW required for the Segment 8A re-route Option 1 would traverse an established population of giant reed (*Arundo donax*). In addition, all ~~three~~ four re-routes would traverse areas supporting populations of various weed species. Because these re-routed segments would occur in areas that currently support weed populations, the potential for the spread of weeds into other less disturbed areas along the re-routes would be high. However, compared to the proposed Project as a whole, these ~~additional~~ impacted areas would ~~only~~ marginally ~~increase~~ decrease the potential for the establishment and spread of noxious weeds in the Southern Region as a result of slightly decreased ground disturbance under this alternative. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), and B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads) would reduce impacts to less than significant (Class II). Therefore, no additional mitigation measures would be required to minimize impacts due to noxious weeds.

Impact B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.

Impacts to wildlife under Alternative 7 in the Northern and Central Regions would be identical to the proposed Project. In the Southern region, Alternative 7 includes one underground 66-kV subtransmission line segment along the proposed Project route in Segment 7, one underground 66-kV subtransmission line re-route along Segment 7, one overhead 66-kV re-route within the existing 220-kV ROW in Segment 7, and ~~one~~ two 66-kV subtransmission line re-route options along Segment 8A that would be overhead construction. ~~Two~~ Three of the re-routes are in the vicinity of the Whittier Narrows Recreation Area. This area is contiguous with the San Gabriel River, which could provide a movement corridor from the San Gabriel Mountains and the Montebello and Puente Hills, which also constitute an east-west movement corridor across the southern San Gabriel Valley and into the Chino Hills and Cleveland National Forest to

the southeast. Many species of wildlife utilize the Whittier Narrows Recreation Area as it is a pocket of open space within an otherwise urbanized environment. New access and spur roads could be required for the approximately ~~1,200~~1,600-foot section of new ROW required for the Segment 8A re-route Option 1 under this alternative. As discussed for the proposed Project, wildlife, including reptiles and small mammals, may be subject to mortality by vehicles on new and existing access roads both during construction and during maintenance activities for the duration of operation of this alternative. Compared to the proposed Project, this alternative would result in similar, but marginally greater, impacts to wildlife under the Segment 8A overhead re-route Option 1. Option 2 follows city streets before entering the existing 220-kV ROW, but would require less ground disturbance as a result of fewer 66-kV structures in the existing ROW. Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would be implemented to reduce impacts to less than significant (Class II) and no additional mitigation measures would be required.

Impact B-5: Construction activities conducted during the breeding season would result in the loss of nesting birds and raptors.

Impacts to birds and raptors under Alternative 7 in the Northern and Central Regions would be identical to the proposed Project. In the Southern region, Alternative 7 includes one underground 66-kV subtransmission line segment along the proposed Project route in Segment 7, one underground 66-kV subtransmission line re-route along Segment 7, one overhead 66-kV re-route within the existing 220-kV ROW in Segment 7, and two 66-kV subtransmission line re-route options along Segment 8A that would be overhead construction. Three of the re-routes are in the vicinity of the Whittier Narrows Recreation Area. ~~In the Southern region, Alternative 7 includes one underground 66-kV subtransmission line segment along the proposed Project route in Segment 7, one underground 66-kV subtransmission line re-route along Segment 7, and one 66-kV subtransmission line re-route along Segment 8A that would be overhead construction. Two of the re-routes are in the vicinity of the Whittier Narrows Recreation Area.~~ The Whittier Narrows Recreation Area is a pocket of open space in an urbanized environment and includes riparian habitats, nonnative woodland, and coastal sage scrub. These communities commonly support breeding birds, including raptors. ~~Because t~~The proposed transmission line would occur along the same route as the proposed Project, and would impact the same habitats~~,~~. ~~t~~The subtransmission line re-routes associated with Alternative 7 would constitute marginally greater impacts to habitats that could support breeding birds under the Segment 8A overhead re-route Option 1. However, under Option 2, less disturbance to areas that could support breeding birds would occur. ~~Additionally, i~~If construction occurs during the breeding season for birds (generally February 1 through August 31 for raptors and March 15 through September 15 for other birds), impacts could include nest abandonment, failure to nest, and direct mortality of eggs and/or nestlings. With the exception of a few species, nesting birds are protected under the Migratory Bird Treaty Act. Nesting birds are also offered protection by the CDFG and raptors (e.g., eagles, hawks, and owls) and their nests are protected under both federal and State law. Therefore, Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would be required to reduce impacts to nesting birds. Implementation of these mitigation measures would reduce impacts to less than significant (Class II). No additional mitigation measures would be required.

Impact B-6: The Project would cause the loss of foraging habitat for wildlife.

Impacts to wildlife foraging habitat under Alternative 7 would be the same as the proposed Project for the Northern and Central Regions. In the Southern Region, impacts would be marginally greater than the proposed Project due to the underground portion of Segment 7 that would go through the Duck Farm Project and the overhead Segment 8A re-route Option 1. Both of these components would impact potential foraging habitat for wildlife that would be in addition to the foraging habitat impacted by the proposed transmission line, which would follow the same route as the proposed Project. The underground portion of Segment 7 that would be placed outside of the Whittier Narrows Recreation Area would follow Durfee Avenue along primarily barren/developed lands. Impacts to foraging habitat for wildlife would be similar but marginally greater in magnitude than the proposed Project under the Segment 8A overhead re-route Option 1 and similar to the proposed Project under Option 2, with the exception of the small increase in ground disturbance at the underground segment in the Duck Farm. These impacts ~~and~~ would require the implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), and Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits). Implementation of the specified mitigation measures would reduce impacts to less than significant (Class II) and no additional mitigation measures would be required.

Impacts to Endangered or Threatened Species, or Proposed or Critical Habitat (Criterion BIO2)

Ground-disturbing activity, including tower pad preparation and construction, grading of new access roads, tower removal, and use or improvement of existing access roads has the potential to disturb listed plant and wildlife species. Impacts to these species are detailed below. Impacts to individual species would be the same as described for the proposed Project (Section 3.4.6.1) and would vary only in magnitude, as described below.

Impact B-7: The Project ~~would~~ could disturb endangered, threatened, or proposed plant species or their habitat.

Potential habitat for Brand's phacelia and thread-leaved brodiaea may occur within the Alternative 7 overhead re-route options and this alternative would result in the incremental increase in the loss of habitat for, and potential disturbance to, these species. The implementation of Mitigation Measures AQ-1a (Implement Construction Fugitive Dust Control Plan), B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and B-7 (Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.) would reduce impacts to Brand's phacelia and thread-leaved brodiaea and other endangered, threatened, and proposed plant species, if present, to less-than-significant levels (Class II). No additional mitigation measures would be required.

Impact B-8: The Project ~~would~~ could result in the loss of California red-legged frogs and Mountain yellow-legged frogs.

The Alternative 7 re-routes would not occur in any areas that would support California red-legged frog or mountain yellow-legged frog populations. In the Alternative 7 project area, habitat for these species

occurs only in the Central Region, where Alternative 7 is identical to the proposed Project. Therefore, impacts to these species would be exactly the same as those described for the proposed Project (Section 3.4.6.1). The implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure B-8a (Conduct protocol surveys for California red-legged frogs and implement avoidance measures), and Mitigation Measure B-8b (Conduct biological monitoring) would reduce potential impacts to these species a less-than-significant level (Class II). Therefore, no additional mitigation measures would be required to minimize impacts to these amphibians.

Impact B-9: The Project would result in the loss of arroyo toad.

Suitable habitat for the arroyo toad does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, habitat for this species occurs primarily in the Central Region where Alternative 7 is identical to the proposed Project. Therefore, impacts to arroyo toads would be exactly the same as those described for the proposed Project (Section 3.4.6.1). SCE would be required to implement APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), and Mitigation Measure B-8b (Conduct biological monitoring). Implementation of these measures would avoid or mitigate take, including loss of habitat, if present, thereby reducing potential impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures would be required to minimize impacts to arroyo toad.

Impact B-10: The Project ~~would~~ could result in the loss of desert tortoise.

Suitable habitat for the desert tortoise does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, habitat for this species occurs only in the Northern Region where Alternative 7 is identical to the proposed Project. Implementation of Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-10 (Conduct surveys for desert tortoises and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would avoid or mitigate effects to this species, including loss of habitat, if present, thereby reducing potential impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures would be required.

Impact B-11: The Project ~~would~~ could result in mortality of desert tortoises as a result of increased predation by common ravens.

Suitable habitat for the desert tortoise does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, habitat for this species occurs only in the Northern Region where Alternative 7 is identical to the proposed Project. Therefore, potential nest sites for common raven as a result of tower construction are not expected to change as a result of implementation of Alternative 7 and impacts would be the same as described for the proposed Project (Section 3.4.6.1). These impacts would not require mitigation because potential nest sites for common raven as a result of tower construction are not expected to increase appreciably. Therefore, additional populations of common raven and their predation pressure on the desert tortoise are not expected to result from additional towers, and impacts would be less than significant (Class III).

Impact B-12: The Project ~~would~~ could result in the loss of special-status fish.

Suitable habitat for special-status fish is very limited in the re-routed portions of Alternative 7, and this area is not within the known distribution of the Santa Ana sucker, Santa Ana speckled dace, or unarmored threespine stickleback. While historically these species were likely present in the watershed they are no longer expected to occur. The arroyo chub has some potential to occur as this species is widely distributed in the region. While there is some potential increase in indirect effects to waterways, the effects of this alternative would be largely the same as the proposed Project. With the exception of the arroyo chub, habitat for these species occurs only in the Central Region where Alternative 7 is identical to the proposed Project. Therefore, impacts to special-status fish would be identical to those described for the proposed Project (Section 3.4.6.1). Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure B-8b (Conduct biological monitoring) would reduce these impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures would be required.

Impact B-13: The Project ~~would~~ could result in the loss of Critical Habitat for the Santa Ana sucker.

Critical habitat for the Santa Ana sucker does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, critical habitat for the Santa Ana sucker occurs only in the Central Region where Alternative 7 is identical to the proposed Project. Therefore, impacts to critical habitat for the Santa Ana sucker would be identical to those described for the proposed Project (Section 3.4.6.1). Implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure B-8b (Conduct biological monitoring) would reduce these impacts to less than significant levels (Class II). Therefore, no additional mitigation measures would be required.

Impact B-14: The Project ~~would~~ could result in the loss of California condor.

The California condor is not known to utilize the Alternative 7 project area in the vicinity of the three re-routes. However, flight paths are changing and there is the potential for this species to forage in this area in the future, although suitable nesting habitat is lacking. The Alternative 7 re-routes will not substantially reduce suitable habitat for the California condor or substantially increase impacts associated with micro-trash ingestion. Therefore, impacts to this species would be the same as those described for the proposed Project (Section 3.4.6.1). Implementation of Mitigation Measure B-1a (Provide restoration/ compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-8b (Conduct biological monitoring), and Mitigation Measure B-14 (Monitor construction in condor habitat and remove trash and micro-trash from the work area daily) would reduce impacts to this species, if present, to less-than-significant levels (Class II). Therefore, no additional mitigation measures would be required.

Electrocutions and/or line collisions as a result of Project implementation are discussed further under Impacts B-20 and B-21.

Impact B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.

There are no ~~known~~ confirmed southwestern willow flycatcher occurrences in the Alternative 7 alignment, and the Alternative 7 re-routes do not fall within critical habitat for willow flycatchers (USFWS, 2005d). However, the Alternative 7 re-routes, as well as portions of the proposed transmission line, are within the historical range of the species and individuals of an undetermined subspecies were detected in Whittier Narrows (AMEC, 2009). Potentially suitable nesting habitat is present within the Whittier Narrows Recreation Area and the Alternative 7 re-route options to the Segment 8A 66-kV subtransmission line. The least Bell's vireo is known to nest along portions of Segment 8 and directly adjacent to Segment 7. Nesting least Bell's vireos have been confirmed at the Whittier Narrows Recreation Area, Tonner Canyon, and the Santa Fe Flood Control Basin. Suitable habitat for the least Bell's vireo occurs along the Alternative 7 above-ground re-route Option 1 in Segment 8A, and territorial least Bell's vireos were detected along the abandoned power line that runs adjacent to Siphon Road in 2009. Virtually all of the suitable habitat along Siphon Road appeared to be occupied in 2009 (AMEC, 2009). However, Alternative 7 would incrementally reduce impacts to the least Bell's vireo as a result of decreased ground disturbance in areas that could support this species. Both Segment 8A re-route options would constitute marginally less impact to least Bell's vireo, although route Option 1 would place the subtransmission line in marginal habitat and would therefore further reduce potential impacts to this species over route Option 2. The yellow-billed cuckoo is not known to currently nest along any portions of Alternative 7. However, Alternative 7 is within the historical range of the yellow-billed cuckoo, and marginally suitable nesting habitat is present in the Whittier Narrows Recreation Area, including the above-ground Segment 8A re-route; Whittier Narrows Nature Center; and the Rio Hondo. Therefore, impacts to special-status riparian birds would be marginally greater than those described for the proposed Project (Section 3.4.6.1) and would require implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat),

Mitigation Measure B-15 (Conduct protocol surveys for listed riparian birds and avoid occupied habitat), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). These measures would reduce impacts to listed riparian birds, if present, to less than significant (Class II). Therefore, no additional mitigation measures would be required.

Impact B-16: The Project would result in the loss of coastal California gnatcatchers.

The coastal California gnatcatcher is known to nest within the Southern Region along Segments 7 and 8 in the Montebello Hills, Coyote Hills near Fullerton, and the Puente-Chino Hills. During focused surveys conducted in August 2007 through January 2008 for the proposed Project, gnatcatchers were detected in the Montebello Hills along Segment 8, at the Puente Hills Landfill near Segment 8, and just south of Turnbull Canyon Road along Segment 8. Subsequent surveys in 2009 detected gnatcatchers in the Puente Hills Landfill and north of the alignment in Powder Canyon. Approximately 14.9 acres of coastal sage scrub habitat occurs within the western portion of the above-ground Segment 8A 66-kV subtransmission line re-route options, which is suitable for coastal California gnatcatcher. Therefore, impacts to this species would be the same but marginally greater in magnitude than those described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-4 through BIO-6 and Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-16 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to reduce impacts to less-than-significant levels (Class II). No additional mitigation measures would be required.

Impact B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.

As described above, suitable habitat for this species occurs in the Alternative 7 Segment 8A 66-kV subtransmission line re-route options, and marginally greater impacts to this species are associated with the alternative. Designated critical habitat occurs in the vicinity of the Whittier Narrows Recreation Area. An additional 1.15 miles of subtransmission line would be constructed within designated critical habitat under this alternative (Segment 8A overhead re-route Option 1). Under the Segment 8A overhead re-route Option 2, the subtransmission line would be in the existing 220-kV ROW where it traverses critical habitat in this area, but would have less ground disturbance in critical habitat than Alternative 2 as a result of a decrease in the number of 66-kV subtransmission line structures. Additionally, the coastal California gnatcatcher is known to nest within the Southern Region along Segments 7 and 8 in the Montebello Hills, Coyote Hills near Fullerton, and the Puente-Chino Hills. Suitable Coastal Sage Scrub habitat within the proposed Project also exists along the San Gabriel River within the Whittier Narrows Recreation Area and within the Segment 8A 66-kV re-route options of Alternative 7. ~~During focused surveys conducted in August 2007 through January 2008 for the proposed Project, gnatcatchers were detected in the Montebello Hills along Segment 8, at the Puente Hills Landfill near Segment 8, and just south of Turnbull Canyon Road along Segment 8.~~ Impacts to the coastal California gnatcatcher habitat would be marginally greater than those described for the proposed Project (Section 3.4.6.1) under this alternative with the Segment 8A overhead re-route Option 1, and would be marginally less under re-route Option 2. Impacts ~~and~~ would require implementation of APMs BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measures B-16 and B-17 (Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures, Preserve off-site

habitat and/or habitat restoration for the coastal California gnatcatcher), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to reduce impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures would be required.

Impact B-18: The Project ~~would~~ could disturb nesting Swainson's hawks.

Suitable habitat for nesting Swainson's hawks does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, this species is likely to nest only in the Northern Region where Alternative 7 is identical to the proposed Project. Therefore, impacts to nesting Swainson's hawks would be identical to the proposed Project. Implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1b (Implement a Worker Environmental Awareness Program), B-18a and B-18b (Conduct pre-construction surveys for Swainson's hawks, Removal of nest trees for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). No additional mitigation measures would be required.

Impact B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.

As described under Impact B-18 above, suitable habitat for nesting Swainson's hawks does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, this species is likely to occur only in the Northern Region where Alternative 7 is identical to the proposed Project. Implementation of Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-3a (Prepare and implement a Weed Control Plan), B-18a (Conduct pre- and during construction surveys for Swainson's hawks), B-19 (Compensate for loss of foraging habitat for Swainson's hawks), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures would be required.

Impact B-20: The Project ~~would~~ could result in electrocution of State and/or federally protected birds.

Among birds, raptors are the most susceptible to electrocution on transmission lines because of their larger size and tendency to perch on transmission poles and towers. The majority of raptor electrocutions are caused by lines that are energized at voltage levels between 1 kV and 69 kV, and "the likelihood of electrocutions occurring at voltages greater than 69 kV is extremely low" (APLIC 2006). Because implementation of Alternative 7 (Segment 8A Option 1) would introduce overhead 66-kV subtransmission lines in Segment 8A in an area that currently does not have active subtransmission lines, the impacted area would be greater in size, and the potential for electrocution of State and/or federally protected birds would be slightly greater. However, the two underground re-routes associated with this alternative would eliminate the potential for electrocution along the undergrounded portions of the line. Therefore, the number of electrocution events would still be insufficient to substantially reduce the number of State and/or federally protected bird species under Alternative 7. SCE would implement APMs BIO-4 and BIO-9 in accordance with the guidance on raptor protection in *Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 2006* (APLIC 2006). However, because of the long duration of the construction phase of the proposed Project, APLIC may update the guidelines during this time frame. Therefore, SCE shall use the most recent APLIC guidelines for protection of raptors on power lines. Impacts to State and/or federally protected birds resulting from electrocution would be less than significant with the implementation of APMs BIO-4 and BIO-9 (Class III) and no mitigation is required.

Impact B-21: The Project ~~would~~ could result in result in collision with overhead wires by State and/or federally protected birds.

Because implementation of Alternative 7 would decrease the length of subtransmission lines along Segments 7 and 8 by a total of approximately 1.76 miles, the impacted area would be slightly smaller in size and the potential for collisions with overhead wires by State and/or federally protected birds would be slightly lower. However, the overhead re-route Option 1 along Segment 8A would introduce subtransmission line conductors in a primarily riparian area that currently includes subtransmission towers but no conductors. This would marginally increase the potential for line strikes in this area. However, the number of collisions along this approximately 1.63-mile portion of subtransmission line is expected to be low. Therefore, the overall number of collision events with overhead wires would still be quite low and insufficient to substantially reduce the number of State and/or federally protected bird species. This impact would require implementation of APM BIO-9 and the incorporation of raptor safety protection into the project design (i.e., tower/conductor [lines] on NFS lands) to reduce impacts to State and/or federally protected birds resulting from transmission line collisions. Line collisions as a result of Project implementation will not substantially reduce the number of State and/or federally protected birds, cause populations to drop below self-sustaining levels, restrict the range, or threaten to eliminate populations. Therefore, impacts to State and/or federally protected birds resulting from transmission and subtransmission line collisions would be less than significant (Class III) and no additional mitigation is required.

Impact B-22: The Project ~~would~~ could result in disturbance to Mohave ground squirrel.

Suitable habitat for the Mohave ground squirrel does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, this species is likely to occur only in the Northern Region where Alternative 7 is identical to the proposed Project. Therefore, impacts to this species would be exactly the same as those described for the proposed Project (Section 3.4.6.1). Implementation of APMs BIO-4 through BIO-7 and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan), Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measures B-22a (Conduct protocol surveys for Mohave ground squirrels), B-22b (Implement construction monitoring for Mohave ground squirrel), and B-22c (Preserve off-site habitat for Mohave ground squirrel) would reduce impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures would be required.

Have a substantial adverse effect on a candidate, Forest Service Sensitive, or special-status species (Criterion BIO3)

Impact B-23: The Project would result in loss of candidate, Forest Service Sensitive, or special-status plant species.

The re-routed portions of Alternative 7 contain habitat that could potentially support several special-status plant species, such as California androsace, Davidson's saltscale, and Parry's spineflower. Impacts to these and any other special-status plant species found to be present would require avoidance (Mitigation Measure B-7, Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.), and, if avoidance is infeasible, off-site acquisition and preservation of occupied habitat (Mitigation Measure B-23, Preserve offsite habitat/management of existing populations of special-status plants). Temporarily

impacted habitat would be restored upon completion of construction (Mitigation Measure B-1a, Provide restoration/compensation for impacts to native vegetation communities). As discussed above, indirect effects to these species that could occur due to the proliferation of noxious weeds resulting from ground-disturbing Project activities shall be reduced by the implementation of Mitigation Measure B-3a (Prepare and implement a Weed Control Plan). In addition, a Worker Environmental Awareness Program would be implemented (Mitigation Measure B-1b, Implement a Worker Environmental Awareness Program) and dust control measures would also be implemented (Mitigation Measure AQ-1a, Implement Construction Fugitive Dust Control Plan). Implementation of these mitigation measures would reduce impacts to less than significant (Class II). No additional mitigation measures would be required.

Impact B-24: The Project ~~would~~ could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.

If pond turtles are present, damage or destruction of southwestern pond turtle nesting areas would constitute a significant impact under CEQA without mitigation. Nesting areas are frequently used by multiple individuals, and suitable nesting habitat can be limited in many areas. Destruction of southwestern pond turtle nesting areas would result in a substantial reduction in numbers of this rare species. Compared to the proposed Project, Alternative 7 (Segment 8A route Option 1) crosses near additional habitats that could potentially support pond turtles. Therefore, impacts to this species would be of the same type but of slightly greater magnitude as those described for the proposed Project (Section 3.4.6.1). Implementation of APMs BIO-1 through BIO-3 and BIO-5 through BIO-7, and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-24 (Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would prevent mortality or injury of pond turtles, avoid damage or destruction of nesting areas or mitigate the loss of nesting habitat, thereby reducing potential impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures would be required.

Impact B-25: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.

Compared to the proposed Project, Alternative 7 (Segment 8A route Option 1) crosses near additional habitats that could potentially support two-striped garter snakes and south coast garter snakes. Therefore, impacts to these species would be of the same type but slightly greater in magnitude as those described for the proposed Project and would require implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), Mitigation Measure B-25 (Conduct focused surveys for the two-striped garter snake and south coast garter snake and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry

weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to avoid injury or mortality to these species, thereby reducing potential impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures would be required.

Impact B-26: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, Coast Range newts.

Suitable habitat for Coast Range newts does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area this species is likely to occur only in the Central Region and portions of the Southern Region where Alternative 7 is identical to the proposed Project. Therefore, impacts to this species would be exactly the same as described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-1 through BIO-7, Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-26 (Conduct focused surveys for coast range newt and implement monitoring, avoidance, and minimization measures), Mitigation Measure H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), Mitigation Measure H-1b (Dry weather construction), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to avoid injury or mortality to this species, thereby reducing impacts to a less-than-significant level (Class II). Therefore, no additional mitigation measures would be required.

Impact B-27: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species (special-status terrestrial herpetofauna).

Compared to the proposed Project, slightly more ground disturbance would occur under Alternative 7. Ground disturbance would occur along Durfee Avenue and within the Duck Farm Project as the 66-kV line would be placed underground in these locations. Additionally, ~~if~~ new towers are required for the Segment 8A overhead re-route Options 1 and 2, and the construction of those towers would also create additional land disturbance. Several special-status terrestrial herpetofauna could be present within the Duck Farm Project underground and Segment 8A overhead re-routes, including silvery legless lizard, coast patch-nosed snake, San Bernardino ringneck snake, and San Diego horned lizard. The re-route along Durfee Avenue is in a primarily developed area and consequently would not be expected to support special-status terrestrial herpetofauna. Because implementation of Alternative 7 would slightly increase ground disturbance, impacts would be slightly larger in size and magnitude for several of the special-status terrestrial herpetofauna species, if present. Implementation of APMs BIO-1 through BIO-7 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-27 (Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II).

Impact B-28: The Project ~~would~~ could disturb wintering mountain plovers.

Suitable habitat for wintering mountain plovers does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, this species is likely to occur only in the Northern Region where Alternative 7 is identical to the proposed Project. Under the proposed Project, these impacts were found to be less than significant. Therefore, these impacts would not require mitigation. Impacts to wintering

mountain plovers resulting from construction disturbance are considered less than significant (Class III) for Alternative 7. No additional mitigation measures would be required.

Impact B-29: The Project would result in the loss of occupied burrowing owl habitat.

The re-routed portions of Alternative 7 traverse some suitable habitat for burrowing owl. Because implementation of Alternative 7 would slightly increase the ground disturbance associated with the Project, the impacted area would be slightly larger in size, and the loss of occupied burrowing owl habitat would potentially be slightly greater in magnitude than that described for the proposed Project. Impacts would be identical to the proposed Project in all other areas of this alternative. These impacts would require the implementation of APMs BIO-2 and BIO-4 through BIO-8 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-29 (Implement CDFG protocol for burrowing owls), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Implementation of the specified mitigation measures for the proposed Project would reduce impacts to less than significant (Class II).

Impact B-30: The Project would result in the loss of occupied California spotted owl habitat.

Suitable habitat for California spotted owl does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, this species occurs only in the Central Region where Alternative 7 is identical to the proposed Project. Therefore, impacts to California spotted owl would be exactly the same as the proposed Project (Section 3.4.6.1) and would require implementation of Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Impacts to the California spotted owl resulting from loss of occupied habitat are considered less than significant with mitigation (Class II). Additional mitigation measures would not be required.

Impact B-31: The Project ~~would~~ could disturb nesting California spotted owls.

As described above under Impact B-29, suitable habitat for California spotted owl does not occur in the re-routed portions of Alternative 7. In the Alternative 7 project area, this species occurs only in the Central Region where Alternative 7 is identical to the proposed Project. Therefore, impacts to nesting California spotted owls would be exactly the same as those described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-2 and BIO-4 through BIO-6 and Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-30 (Conduct pre- and during construction nest surveys for spotted owl), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) to reduce impacts to less-than-significant levels (Class II). Therefore, no additional mitigation measures would be required.

Impact B-32: The Project ~~would~~ could disturb nesting avian "species of special concern."

Construction-related disturbance that causes nest abandonment and/or loss of reproductive effort would constitute a significant impact and violate the MBTA. Compared to the proposed Project, Alternative 7 Segment 8A reroute Option 1 would impact slightly more riparian, coastal sage scrub, and nonnative woodland habitats that could support nesting avian species of special concern. Route Option 2 would impact slightly more nonnative woodland and coastal sage scrub that could support nesting birds.

Therefore, disturbance to these species would potentially be slightly greater in magnitude than that described for the proposed Project (Section 3.4.6.1). However, implementation of APMs BIO-4 through BIO-6 and Mitigation Measures B-1a (Provide restoration/ compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No additional mitigation measures would be required.

Impact B-33: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status bat species.

Alternative 7 would include construction of an overhead 66-kV subtransmission line through additional coastal sage scrub, ruderal grassland, nonnative woodland (Segment 8A route Options 1 and 2), and various riparian habitats (Segment 8A route Option 1) compared to Alternative 2. All of these vegetation communities could potentially support special-status bat species. Therefore, potential for mortality of and loss of habitat for special-status bat species would be slightly greater in magnitude over the proposed Project if suitable trees, particularly trees ≥12 inches in diameter at 4.5 feet above grade with loose bark or other cavities, are present prior to construction activities. In all areas other than these~~is~~ re-route options, impacts to special-status bat species would be ~~exactly the same as~~ slightly less than those described for the proposed Project because of the reduction in 66-kV towers along Segment 7 in the Whittier Narrows Recreation Area. If active hibernacula and maternity roosts are present and cannot be avoided, impacts would be significant. However, implementation of APMs BIO-1, BIO-4, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), AQ-1a (Implement Construction Fugitive Dust Control Plan), B-33a (Maternity colony or hibernaculum surveys for roosting bats), B-33b (Provision of substitute roosting bat habitat), and B-33c (Exclude bats prior to demolition of roosts) would reduce impacts to a less-than-significant level (Class II). Additional mitigation would not be required under this alternative.

Impact B-34: The Project ~~would~~ could result in transmission line strikes by special-status bat species.

As implementation of Alternative 7 would re-route subtransmission lines along Segments 7 and 8 underground by a total of approximately 1.76 miles, the impacted area would be slightly smaller in size, and the potential for collisions with overhead wires by special-status bat species would be slightly lower. However, the overhead re-route Option 1 along Segment 8A would introduce subtransmission line conductors in a primarily riparian area that currently includes subtransmission towers but no conductors. This would marginally increase the potential for line strikes in this area. Alternative 7 would potentially impact special-status bat species through ~~the direct take~~mortality of individuals from fatal strikes with transmission and subtransmission lines. However, given that most bat species can use echolocation to discriminate objects as small as 0.4 to 0.004 inches in size (Vaughan 1986), and the size of guard lines and 500-kV or 220-kV transmission lines are typically equal to or greater than 0.5 inches in diameter (SCE 2007), the frequency of transmission line strikes is expected to be extremely low. In addition, 954 kcmil AAC subtransmission line conductor has a diameter of approximately 1.12 inches, large enough for bats to detect through echolocation. Therefore, the number of fatal strikes is still expected to be quite low

and insufficient to substantially reduce the number of these species, and impacts would be less than significant (Class III).

Impact B-35: The Project ~~would~~ could result in mortality of and loss of habitat for, special-status mammals.

Suitable habitat for southern grasshopper mouse, San Diego black-tailed jackrabbit, and northwestern San Diego pocket mouse occurs within the re-routed portions of Alternative 7. Although the habitat impacted by implementation of Alternative 7 would not substantially reduce available habitat, there remains the possibility of mortality to these species during construction and maintenance activities. Implementation of APM BIO-1 and APM BIO-5 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-2 (Implement RCA Treatment Plan), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan) would minimize impacts to special-status mammal species. Therefore, impacts to these species as a result of implementation of Alternative 7 would be less than significant with mitigation incorporated (Class II).

Impact B-36: The Project ~~would~~ could result in mortality of San Diego desert woodrats.

Alternative 7 would not increase the likelihood of mortality to the San Diego desert woodrat as the species is not likely occur within the Alternative 7 re-routes due to a lack of suitable habitat. Therefore, impacts to this species would be identical to those described for the proposed Project (Section 3.4.6.1). Construction activities would substantially reduce regional populations of this species in the Chino and Puente Hills without mitigation. Impacts to this species as a result of Project implementation would be reduced to a less-than-significant level (Class II) with the implementation of APMs BIO-1 and BIO-4 through BIO-6 and Mitigation Measure B-1a (Provide restoration/compensation for impacts to native vegetation communities), Mitigation Measure B-1b (Implement a Worker Environmental Awareness Program), Mitigation Measure B-3a (Prepare and implement a Weed Control Plan), Mitigation Measure B-36 (Conduct focused surveys for San Diego desert woodrats and passively relocate), and Mitigation Measure AQ-1a (Implement Construction Fugitive Dust Control Plan). Therefore, no additional mitigation measures would be required.

Impact B-37: The Project ~~would~~ could result in mortality of and loss of habitat for, the ringtail.

Marginal habitat for ringtail occurs in the Whittier Narrows Recreation Area in the vicinity of the Segment 8A overhead 66-kV subtransmission line re-route Option 1. This additional acreage of riparian habitat, compared to the proposed Project, would marginally increase the magnitude of impacts to ringtail, if present. In all other areas, impacts to ringtail would be identical to those described for the proposed Project (Section 3.4.6.1) and would require the implementation of APMs BIO-1, BIO-4, and BIO-6 and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-37 (Conduct focused surveys for ringtail and passively relocate during the non-breeding season), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan), which would reduce Alternative 7 impacts to ringtails to a less-than-significant level (Class II). No additional mitigation measures would be required.

Impact B-38: The Project ~~would~~ could result in mortality of American badgers.

Suitable grassland habitat for American badgers exists within the Segment 7 Duck Farm Project underground portion and the Segment 8A overhead re-route options of the 66-kV subtransmission line. The Segment 7 underground re-route along Durfee Avenue does not support suitable habitat for American badgers as it traverses primarily developed lands. The potential for mortality of American badgers along the re-routed portions of this alternative is small, as potential habitat acreages are small and fragmented. However, any potential mortality would be significant but implementation of APMs BIO-1, BIO-4, BIO-5, BIO-6, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-3a (Prepare and implement a Weed Control Plan), B-38 (Conduct focused surveys for American badger and passively relocate during the non-breeding season), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce impacts to less than significant (Class II). No additional mitigation measures would be required.

Have a substantial adverse effect on federally protected wetlands (Criterion BIO4)

Impact B-39: The Project ~~would~~ could result in the loss of wetland habitats.

The above-ground Segment 8A re-route Option 1 would traverse riparian habitat near federally protected wetlands in the Whittier Narrows Recreation Area. Any loss of these habitats ~~associated with the proposed Project~~ is significant. Implementation of this alternative may increase the potential to disturb wetland habitat. If avoidance of jurisdictional waters and wetlands is not possible, implementation of APMs BIO-1 through BIO-7, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-12 (Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and AQ-1a (Implement Construction Fugitive Dust Control Plan) would reduce the impacts to federally protected wetlands to less-than-significant levels (Class II). Therefore, no additional mitigation measures would be required.

Interfere substantially with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)

Impact B-40: The Project ~~would~~ could interfere with established bird and bat migratory corridors.

Alternative 7 would potentially impact migrating bird and bat species through interference with established migratory corridors as a result of fatal collisions with transmission and subtransmission lines. Because implementation of Alternative 7 (Options 1 and 2) would introduce 66-kV subtransmission lines in an area that currently does not support subtransmission lines, interference with bird and bat migratory corridors could be slightly greater in magnitude. However, the frequency of transmission line strikes is still expected to be extremely low. Therefore, implementation of Alternative 7 would not substantially interfere with established bird or bat migratory corridors, and impacts to migrating bird and bat species would be less than significant (Class III).

Impact B-41: Corona noise ~~would~~ could result in disturbance to wildlife.

Corona generates audible noise during operation of transmission lines. The noise is generally characterized as a crackling, hissing, or humming sound and is most noticeable during wet conductor

conditions such as rain or fog. Because implementation of Alternative 7 would introduce 66-kV subtransmission lines in an area that currently does not support subtransmission lines, this impact is potentially slightly greater in magnitude than the proposed Project. However, corona noise is not known to occur on subtransmission lines at levels that would cause disturbance. In addition, the two underground re-routes associated with this alternative would eliminate the potential for corona noise from the 66-kV subtransmission lines in the area of the Duck Farm Project and along Durfee Avenue in the City of South El Monte. Corona noise impacts associated with the transmission facilities that are proposed for this alternative would be identical to those described for the proposed Project. As the effects of corona noise on wildlife are poorly understood, it is difficult to predict the degree to which the increase in corona noise will impact local wildlife. Corona noise is already present along most of Alternative 7, and while Alternative 7 would result in louder corona noise for most segments and a new sources of corona noise for the new segments, wildlife can be expected to have already been exposed and likely habituated to this disturbance. Therefore, implementation of Alternative 7 would not result in substantial impacts due to corona noise. This impact would be less than significant (Class III).

Impact B-42: The Project would result in effects to Management Indicator Species.

In the Alternative 7 project area, MIS occur only in the Central Region (ANF) where Alternative 7 is identical to the proposed Project. Therefore, impacts to MIS would be exactly the same as described for the proposed Project (Section 3.4.6.1) and would require implementation of APMs BIO-1 through BIO-7, and Mitigation Measures B-1a (Provide restoration/compensation for impacts to native vegetation communities), B-1b (Implement a Worker Environmental Awareness Program), B-1c (Treat cut tree stumps with Sporax), B-2 (Implement RCA Treatment Plan), B-3a (Prepare and implement a Weed Control Plan), B-3b (Remove weed seed sources from construction access routes), B-3c (Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads), B-5 (Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat), B-8b (Conduct biological monitoring), B-9 (Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas), B-30 (Conduct pre- and during construction nest surveys for spotted owl), AQ-1a (Implement Construction Fugitive Dust Control Plan), H-1a (Implement an Erosion Control Plan and demonstrate compliance with water quality permits), and H-1b (Dry weather construction) to reduce impacts to less than significant (Class II). No further mitigation is required.

Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances (Criterion BIO6)

Because of the extensive planning involved in project design, including implementation of APMs BIO-1 through BIO-7, and the mitigation measures described above in Criteria BIO1 through BIO5, Alternative 7 is consistent with the local and regional policies and ordinances protecting biological resources including the Los Angeles County Tree Removal requirements, the Palmdale Municipal Code, and the California Desert Native Plants Act. No additional policies or ordinances apply to the Alternative 7 re-routes. Therefore, no impact would occur.

Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP (Criterion BIO7)

Through project design and implementation of APMs BIO-1 through BIO-7 and the mitigation measures described in Criteria BIO1 through BIO5, SCE shall ensure consistency with the conservation goals of the WMPHCP. Implementation of Alternative 7 will not affect the conservation goals of the WMPHCP

differently than was described for the proposed Project because the re-routes associated with this alternative do not occur within the WMPHCP planning area. Therefore, no impact would occur.

3.4.11.2 Cumulative Effects Analysis

This section addresses potential cumulative effects that would occur as a result of implementation of Alternative 7 (66-kV Subtransmission Alternative). This alternative consists of an underground 66-kV subtransmission line segment through the Duck Farm Project along Segment 7, a brief underground re-route of the 66-kV subtransmission line along Durfee Avenue around the Whittier Narrows Recreation Area, an above-ground modification to the configuration of the 66-kV subtransmission line within Segment 7 in the Whittier Narrows Recreation Area, and ~~an~~ two above-ground re-route options of the 66-kV subtransmission line in the vicinity of the Whittier Narrows Recreation Area and the San Gabriel River. The remainder of this alternative route and the transmission line components of this Alternative would be identical to that of the proposed Project and would, therefore, result in identical impacts as the proposed Project. The re-routed portion of the Alternative 7 route generally parallels the proposed Project route. As a result, this alternative traverses the same or similar habitat types as the portion of the proposed Project 66-kV subtransmission route it is proposed to replace, would require the same types of construction activities to build, and would result in the same operational capacity as the proposed Project. Based on the substantial similarity of Alternative 7 to the proposed Project, this alternative's contribution to cumulative impacts would be identical to that of the proposed Project.

Geographic Extent

Alternative 7 only differs from the proposed Project for a very small portion of the proposed 66-kV subtransmission line route in the vicinity of the Whittier Narrows Recreation Area along Segments 7 and 8A and the Duck Farm Project along Segment 7. These areas are still encompassed by the geographic extent of the cumulative analysis defined for Alternative 2 in Section 3.4.6.2. Therefore, the geographic extent of the cumulative analysis for Alternative 7 is exactly the same as that for Alternative 2 and would include all of the Northern, Central, and Southern Regions.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 7 are exactly the same as for Alternative 2, as described in Section 3.4.6.2.

Reasonably Foreseeable Future Projects and Changes

Reasonably foreseeable future projects and changes to the cumulative scenario for Alternative 7 would be exactly the same as Alternative 2, described in Section 3.4.6.2.

Cumulative Impact Analysis

As described in Section 3.4.6.2, impacts associated with Alternative 7 would contribute to cumulative impacts ~~be cumulatively considerable~~ if they would have the potential to combine with similar impacts of other past, present, or reasonably foreseeable projects. The minor re-routes of the proposed Project 66-kV subtransmission lines associated with Alternative 7 would not differ from the proposed Project's contribution to cumulative impacts and therefore, cumulative impacts of Alternative 7 would be exactly the same as cumulative impacts for Alternative 2.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

Mitigation measures introduced for Alternative 7 in Section 3.4.11.1 (Direct and Indirect Effects Analysis) would help to reduce this alternative's incremental contribution to cumulative impacts. However, no additional mitigation measures have been identified that would reduce cumulative impacts to a less-than-significant level.

3.4.12 Impact Significance Summary

Table 3.4-27 summarizes the direct and indirect environmental impacts of the proposed Project (Alternative 2) and the other alternatives on biological resources. The direct and indirect effects of the Project and alternatives have been fully described in Sections 3.4.6 through 3.4.11 above. Alternative 1 (No Project/No Action) impacts are fully described in Sections 3.4.5; however, since no potential future project information is available an impact significance level for Alternative 1 is not included in the table below.

Table 3.4-27. Summary of Impacts and Mitigation Measures – Biological Resources

Impact	Impact Significance								Mitigation Measures
	Alt. 1+	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
B-1: Construction activities would result in temporary and permanent losses of native vegetation.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a: Provide restoration/compensation for impacts to native vegetation communities. B-1b: Implement a Worker Environmental Awareness Program. B-1c: Treat cut tree stumps with Sporax AQ-1a: Implement Construction Fugitive Dust Control Plan. H-1a: Implement an Erosion Control Plan and demonstrate compliance with water quality permits.
B-2: The Project would result in the loss of desert wash or riparian habitat.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, AQ-1a, H-1a B-2: Implement RCA Treatment Plan
B-3: The Project would result in the establishment and spread of noxious weeds.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-2 B-3a: Prepare and implement a Weed Control Plan. B-3b: Remove weed seed sources from construction access routes. B-3c: Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.
B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, AQ-1a, H-1a

Table 3.4-27. Summary of Impacts and Mitigation Measures – Biological Resources

Impact	Impact Significance							Mitigation Measures
	Alt. 1+	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
B-5: Construction activities conducted during the breeding season would result in the loss of nesting birds or raptors.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a B-5: Conduct pre-construction surveys and monitoring for breeding birds.~~protocol or focused surveys for listed riparian birds and avoid occupied habitat~~.
B-6: The Project would cause the loss of foraging habitat for wildlife.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, AQ-1a, H-1a
B-7: The Project ~~would~~ could disturb endangered, threatened, or proposed plant species or their habitat.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a, H-1a B-7: Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.
B-8: The Project ~~would~~ could result in the loss of California red-legged frogs and mountain yellow-legged frogs.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, AQ-1a, H-1a B-8a: Conduct protocol surveys for California red-legged frogs and implement avoidance measures. B-8b: Conduct biological monitoring. H-1b: Dry weather construction.
B-9: The Project would result in the loss of arroyo toads.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-8b, AQ-1a, H-1a, H-1b B-9: Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas.
B-10: The Project ~~would~~ could result in the loss of desert tortoises.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	No	B-1a, B-1b, B-3a, AQ-1a B-10: Conduct presence or absence surveys for desert tortoise, preserve habitat, and implement avoidance measures.
B-11: The Project ~~would~~ could result in mortality of desert tortoises as a result of increased predation by common ravens.	Not known	Class III	Class III	Class III	Class III	Class III	Class III	No	None recommended.
B-12: The Project ~~would~~ could result in the loss of special-status fish.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-8b, H-1a, H-1b B-12: Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms.
B-13: The Project ~~would~~ could result in the loss of Critical Habitat for the Santa Ana sucker.	Not known	Class II	Class II	Class II	Class II	~~Class II~~No Impact	Class II~~I~~	Yes	B-1a, B-1b, B-2, B-3a, B-8b, H-1a, H-1b, B-12

Table 3.4-27. Summary of Impacts and Mitigation Measures – Biological Resources

Impact	Impact Significance							Mitigation Measures
	Alt. 1+	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
B-14: The Project ~~would~~ could result in the loss of California condors.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-8b B-14: Monitor construction in condor habitat and remove trash and micro-trash from the work area daily.
B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-5, AQ-1a, H-1a B-15: Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat.
B-16: The Project would result in the loss of coastal California gnatcatchers.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	~~Yes~~No	B-1b, AQ-1a B-16: Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures.
B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	~~Yes~~No	B-1a, B-3a, B-15, AQ-1a B-17: Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher.
B-18: The Project ~~would~~ could disturb nesting Swainson's hawks.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	No	B-1b, AQ-1a B-18a: Conduct pre-construction surveys for Swainson's hawks. B-18b: Removal of nest trees for Swainson's hawks.
B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	No	B-1a, B-3a, B-17a, AQ-1a B-19: Compensate for loss of foraging habitat for Swainson's hawks.
B-20: The Project ~~would~~ could result in electrocution of State and/or federally protected birds.	Not known	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
B-21: The Project ~~would~~ could result in collision with overhead wires by State and/or federally protected birds.	Not known	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
B-22: The Project ~~would~~ could result in disturbance to Mohave ground squirrels.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	No	B-1a, B-1b, B-3a, AQ-1a B-22a: Conduct protocol surveys for Mohave ground squirrels. B-22b: Implement construction monitoring for Mohave ground squirrels. B-22c: Preserve off-site habitat for the Mohave ground squirrel.

Table 3.4-27. Summary of Impacts and Mitigation Measures – Biological Resources

Impact	Impact Significance								Mitigation Measures
	Alt. 1+	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
B-23: The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, B-7, AQ-1a, H-1a B-23: Preserve offsite habitat/management of existing populations of special-status plants.
B-24: The Project ~~would~~ could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a, H-1a, H-1b B-24: Conduct focused presence/absence surveys for southwestern pond turtle and implement monitoring, avoidance, and minimization measures.
B-25: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a, H-1a, H-1b B-25: Conduct focused surveys for the two-striped garter snake and south coast garter snake and implement monitoring, avoidance, and minimization measures.
B-26: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, Coast Range newts.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a, H-1a, H-1b B-26: Conduct focused surveys for coast range newt and implement monitoring, avoidance, and minimization measures.
B-27: The Project ~~would~~ could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a B-27: Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna.
B-28: The Project ~~would~~ could disturb wintering mountain plovers.	Not known	Class III	Class III	Class III	Class III	Class III	Class III	No	None recommended.
B-29: The Project would result in the loss of occupied burrowing owl habitat.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	No	B-1a, B-1b, B-3a, AQ-1a B-29: Implement CDFG protocol for burrowing owls.
B-30: The Project would result in the loss of occupied California spotted owl habitat.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-3a, AQ-1a B-30: Conduct pre- and during construction nest surveys for spotted owl.
B-31: The Project ~~would~~ could disturb nesting California spotted owls.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1b, B-30~~29~~, AQ-1a
B-32: The Project ~~would~~ could disturb nesting avian "species of special concern."	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-5, AQ-1a

Table 3.4-27. Summary of Impacts and Mitigation Measures – Biological Resources

Impact	Impact Significance								Mitigation Measures
	Alt. 1+	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
B-33: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status bat species.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, AQ-1a B-33a: Maternity colony or hibernaculum surveys for roosting bats. B-33b: Provision of substitute roosting bat habitat. B-33c: Exclude bats prior to demolition of roosts.
B-34: The Project ~~would~~ could result in transmission line strikes by special-status bat species.	Not known	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
B-35: The Project ~~would~~ could result in mortality of, and loss of habitat for, special-status mammals.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, AQ-1a
B-36: The Project ~~would~~ could result in mortality of San Diego desert woodrats.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a B-36: Conduct focused surveys for San Diego desert woodrats and passively relocate.
B-37: The Project ~~would~~ could result in mortality of, and loss of habitat for the ringtail.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a, H-1a B-37: Conduct focused surveys for ringtail and passively relocate ringtail during the non-breeding season.
B-38: The Project ~~would~~ could result in mortality of American badgers.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a B-38: Conduct focused surveys for American badger and passively relocate during the non-breeding season.
B-39: The Project ~~would~~ could result in the loss of wetland habitats.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, AQ-1a, H-1a
B-40: The Project ~~would~~ could interfere with established bird and bat migratory corridors.	Not known	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
B-41: Corona noise ~~would~~ could result in disturbance to wildlife	Not known	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
B-42: The Project would result in effects to Management Indicator Species	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-1c, B-2, B-3a, B-3b, B-3c, B-5, B-8b, B-9, B-30, AQ-1a, H-1a, H-1b

* Indicates whether this impact is applicable to the portion of the Project on National Forest System lands. The significance determination for each impact will be made by the federal lead agency.

+ Potential projects would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and subsequently introduce similar types of impacts

Class I – Significant, unavoidable impact
Class II – Less than significant impact with mitigation incorporated
Class III – Less than significant impact
Class IV – Beneficial impact

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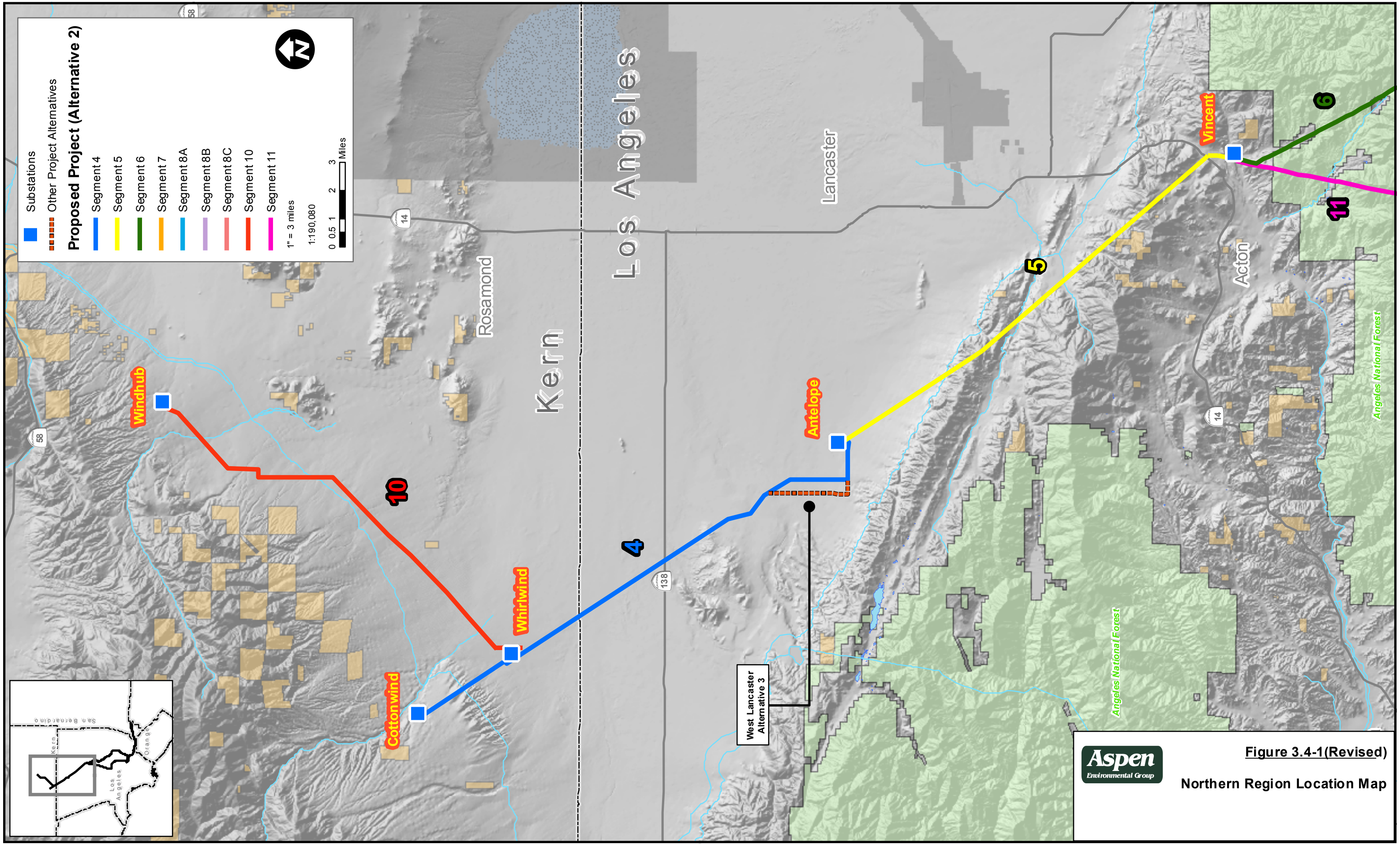


Aspen Environmental Group

Figure 3.4-1(Revised)

Northern Region Location Map

Legend

Roads on ANF
- Paved Road - to be used
- Maintenance Road
- Reconstruction Road
- New Road
- Private Road
- Forest Service Roads
- Helicopter Staging Areas - Alt6
- Helicopter Staging Areas - Alt2
- 2.5 Mile Helicopter Buffer
- Pulling Sites
- Alternate Pulling Sites

Proposed Routes
- Segment 6
- Segment 11
- Substation
- Segment Milepost Marker

1" = ~1.5 miles

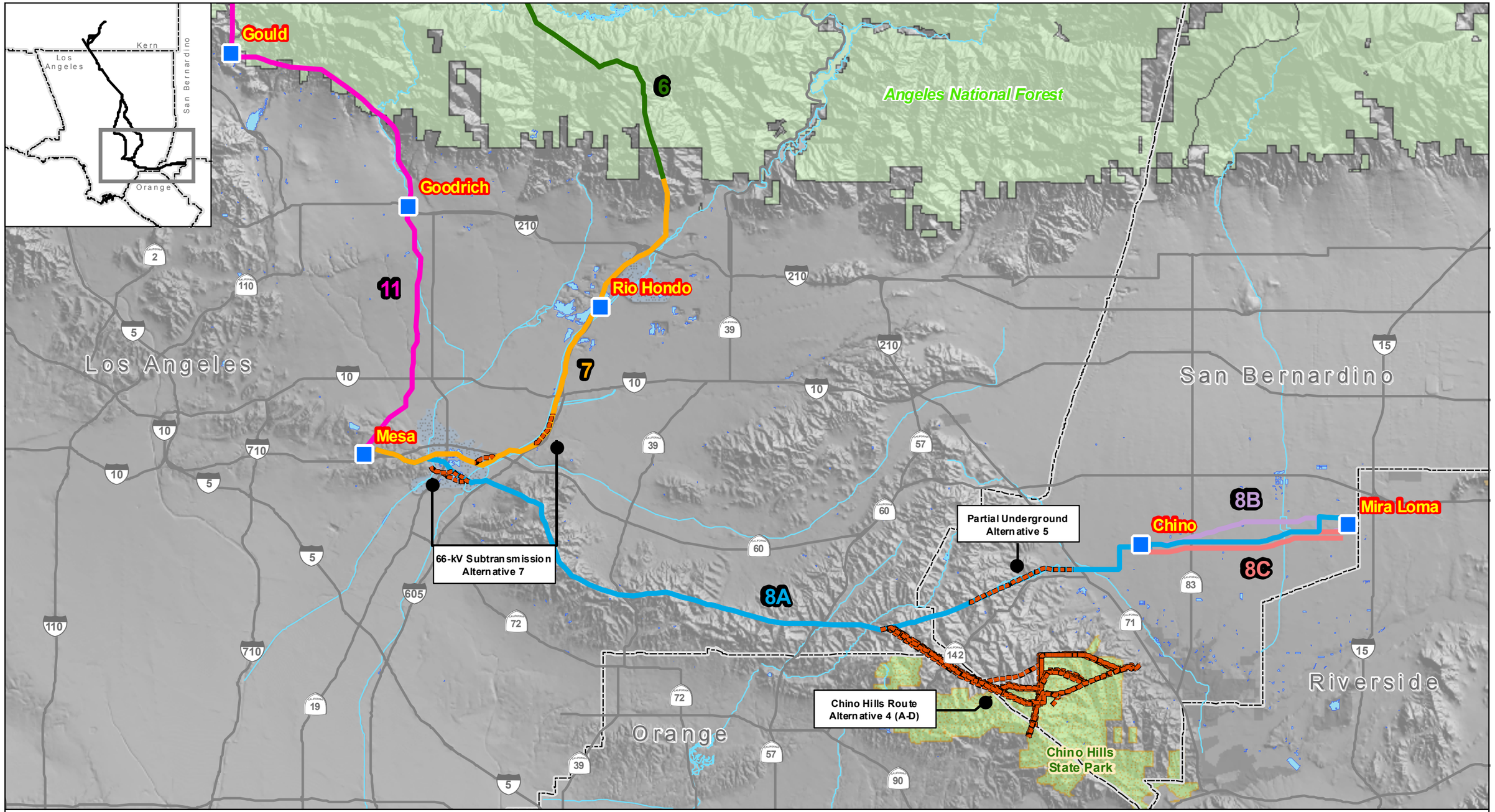
1:110,000

1 0 0.5 1 Miles

Vincent
Angeles Forest Highway
Angeles National Forest
SCE #0
SCE #1
SCE #2
SCE #3
SCE #3B
SCE #4
SCE #5
SCE #6
SCE #6B
SCE #7
SCE #8
SCE #9
SCE #10
SCE #11
Gould
Goodrich
14
605
210
134

Figure 3.4-2 (Revised)

Central Region Location Map



Aspen Environmental Group

1" = 3 miles

1:190,080

0 1.5 3 6 Miles

Proposed Project (Alternative 2)

- Segment 6
- Segment 7
- Segment 8A
- Segment 8B
- Segment 8C
- Segment 11
- Substations
- Other Project Alternatives

Figure 3.4-3 (Revised)
Southern Region Location Map

3.5 Cultural Resources

3.5.1 Introduction

This section describes effects related to cultural resources that would be caused by implementation of the TRTP. The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts for a range of Project alternatives, and recommends measures to reduce or avoid adverse impacts anticipated from Project construction and operation. In addition, existing laws and regulations relevant to cultural resources are described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Project.

SCE's proposed Project involves construction of new and upgraded transmission infrastructure along approximately 173 miles of new and existing ROW from the Tehachapi Wind Resource Area (TWRA) in southern Kern County south through Los Angeles County and the Angeles National Forest (ANF) and east to the existing Mira Loma Substation in Ontario, San Bernardino County, California. The major components of the proposed Project have been separated into eight distinct segments; seven of these are transmission lines, while one encompasses added and upgraded substation facilities. A more detailed description of the proposed TRTP components, by segment, is presented in Chapter 2 of this EIR/EIS. This analysis also includes several alternatives to the proposed Project that the Lead Agencies have determined would accomplish the primary Project purpose and need, are feasible, and would avoid or lessen certain adverse effects associated with SCE's proposed Project.

Cultural resources eligible for the National Register of Historic Places (NRHP) or California Register of Historical Resources (CRHR) may be affected by ground-disturbing activities such as tower site preparation and tower construction; tower removal and replacement; grading of new access or spur roads; use or improvement of existing access roads; installation of new conductor wire (reconductoring) on the existing transmission lines; transportation, storage, and maintenance of construction equipment and supplies; and staging area and material yard preparation and use. Impacts could also result from inadvertent trespass out of designated work areas or roads. Indirect impacts, such as increased erosion, might also occur during operation and long-term presence of the proposed Project.

The information and analysis that is presented in this section has been derived from the *Tehachapi Renewable Transmission Project Cultural Resources Specialist Report (Confidential)*, prepared by Applied Earthworks, Inc. (2009~~8~~). ~~While~~ This section presents the findings of the *Cultural Resources Specialist Report*, ~~please refer~~which has a limited distribution to ~~that report for more detailed information on Project effects related to cultural resources~~ensure the protection of culturally sensitive sites.

Scoping Issues Addressed

During the scoping period for the EIR/EIS (August-October 2007), a series of scoping meetings were conducted with the public and government agencies, and written comments were received by agencies and the public that identified issues and concerns. The following issues related to cultural resources that were raised during scoping are addressed in this section:

- Native American representatives requested that they be included in continuing consultation as the Project proceeds, and that tribal monitors observe ground disturbing construction work to ensure that resources of concern are managed properly.

Summary and Comparison of Alternatives

Table 3.5-1 on the following page presents some key factors related to cultural resources for each alternative. It is important to note that the "Environmental Issues" indicated in Table 3.5-1 are not impact statements, but rather selected information items that provide a comparison between the alternatives. Specific impact statements that have been identified for the Project and alternatives, in accordance with the significance criteria introduced in Section 3.5.4.1 (Criteria for Determining Impact Significance), are further described in Sections 3.5.5 through 3.5.11.

3.5.2 Affected Environment

According to 36 CFR 800.16(d), the Area of Potential Effects (APE) is the geographic area or areas within which a federally funded, authorized, or permitted project (in this case, the TRTP) may directly or indirectly cause changes in the character or use of properties listed on, or eligible for listing on, the National Register of Historic Places, if such properties exist. For the TRTP, the Forest Service, in consultation with the California State Historic Preservation Officer (SHPO) and the CPUC, established the APE in which efforts to identify cultural resource impacts occurred.

The area of potential effects is influenced by the scale and nature of the proposed Project and alternatives and may be different for different kinds of effects. The APE includes:

- All alternative locations for all elements of the undertaking;
- All locations where the undertaking may result in ground disturbance;
- All locations from which elements of the undertaking (e.g. Structures or land disturbance) may be visible or audible; and
- All locations where the activity may result in changes in traffic patterns, land use, public access, etc.

For the TRTP, the APE is defined as a continuous corridor along all segments of the proposed Project and alternatives, including locations of existing and new transmission structures, existing and new substations, access and spur roads, and areas of temporary construction activity. On the ANF (Segments 6 and 11), the APE is 500 feet wide. For any marshalling yards, wire setup sites, helicopter staging areas, helicopter landing zones, or other areas similarly used for the Project outside the 500-foot wide corridor, the APE also includes a 100-foot wide buffer beyond the proposed boundary of the proposed use area. For any access and spur roads, construction turn-arounds, guard pole locations, or other linear facility outside the 500-foot wide corridor, the APE extends for 50 feet on either side of the center line.

For Project Segments 4, 5, 7, 8, 9 (Substations), and 10, which are outside the boundaries of the ANF, the APE is 250 feet wide. For any marshalling yards, wire setup areas, helicopter staging areas, helicopter landing zones, or other areas similarly used for the Project outside the 250-foot wide corridor, the APE also includes a 50-foot wide buffer beyond the proposed boundary of the proposed use area. For any access and spur roads, construction turn-arounds, guard pole locations, or other linear facility outside the 250-foot wide corridor, the APE extends for 50 feet on either side of the center line.

Table 3.5-1. Summary Comparison of Environmental Issues – Cultural Resources

Environmental Issues	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3 (West Lancaster)	Alternative 4 (Chino Hills)	Alternative 5 (Partial Underground)	Alternative 6 (Max. Helicopter in ANF)	Alternative 7 (66-kV Subtransmission)
Number of identified resources in the APE.	The number and nature of cultural resources cannot be determined without specific information about actions that might occur in lieu of the Project.	135 (~~57~~66 prehistoric / ~~73~~64 historical / 5 both)	Same as Alternative 2.	~~139~~143 (~~58~~67 prehistoric / ~~75~~69 historical / ~~6~~7 both)	Same as Alternative 2.	~~142~~140 (~~63~~69 prehistoric / ~~74~~65 historical / ~~5~~6 both)	~~151~~149 (~~57~~66 prehistoric / ~~88~~78 historical / ~~6~~5 both)
Number of resources avoided.	Resources in the Project APE would be avoided, but new projects in lieu of the Project affect other resources.	Not known without additional information.	None.	~~Five~~Two along Segment 8A.	Not known without additional information.	Not known without additional information.	None.
Number of resources added.	Not known.	Not known without additional information.	None.	~~9~~10	Not known without additional information.	~~7~~5	~~10~~14
New/Expanded ROW required?	Not known.	Yes; ~~43~~56.8 miles.	Yes; ~~44~~57.2 miles.	Yes. Route A: ~~49~~62.6 miles Route B: ~~53~~66.1 miles Route C: 65.7~~52.7~~ miles (includes re-routed 220/500kV T/Ls) Route C Mod: 64.9 miles (includes re-routed 220/500kV T/Ls) Route D: ~~53~~66.2 miles	Same as Alternative 2.	Same as Alternative 2.	Yes; ~~44~~57.0 miles.
Disturbance in previously undisturbed areas?	Impacts would occur as a result of various actions in lieu of the Project, but the extent of such impacts is not known.	Yes.	Yes, but greater than Alternative 2.	Yes, but greater than Alternative 2.	Yes; extent unknown without additional information.	Yes; extent unknown without additional information.	Yes; extent unknown without additional information.
Potential for unanticipated discoveries during construction.	Impacts would occur as a result of various actions in lieu of the Project, but the extent of such impacts is not known.	Yes.	Yes, but greater than Alternative 2.	Yes, but greater than Alternative 2.	Same as Alternative 2.	Same as Alternative 2.	Yes, but greater than Alternative 2.

Background Research

Pacific Legacy, Inc. (2007) and Applied EarthWorks, Inc. (2009) conducted records searches and background research for the proposed Project and Project alternatives. Principal repositories of baseline data were the Archaeological Information Centers of the California Historical Resources Information System, including:

- Southern San Joaquin Valley Information Center, Department of Anthropology, California State University, Bakersfield
- The South Central Coastal Information Center, Department of Anthropology, California State University, Fullerton
- San Bernardino Archeological Information Center, San Bernardino County Museum, Redlands

In addition to the data contained on their site location and survey coverage base maps, the Information Centers also provided records of properties listed in the following historic registers maintained by the State of California:

- National Register of Historic Places (Directory of Determinations of Eligibility, California Office of Historic Preservation, Volumes I and II, 2001)
- California Inventory of Historic Resources (State of California 1976)
- California Historical Landmarks (State of California 1996)
- California Points of Historical Interest listing (State of California 1992)
- Historic Property Data File (State of California 2005)

In addition, the Supervisor's Office of the Angeles National Forest, Arcadia, California, provided information on cultural resource inventories and cultural properties within the Forest. At each of these facilities, survey coverage base maps were examined along with relevant historic maps, excavation and survey reports, and cultural resource records. Existing site forms were obtained for recorded sites within one-quarter mile of transmission lines and other facilities. The records searches revealed that 443 prior cultural resource studies had been completed within one mile of the APE; 97 of these studies were located on the ANF. Of these prior studies, 148 crossed or encompassed some portion of the APE, including 83 on the ANF. Specific details of the records searches and field surveys are discussed by individual Project alternative below.

Native American Consultation

Pacific Legacy, Inc. submitted a request to the California Native American Heritage Commission (NAHC) for a search of their Sacred Lands Inventory files to identify culturally significant properties along Project segments. In a letter dated February 20, 2007, the NAHC replied that no sacred lands were known to the NAHC in the TRTP or the immediate vicinity. As a result of changes in the Project description a second request was sent to the NAHC on April 4, 2007. The NAHC replied on April 23, 2007, that several known sites ~~known to contain human remains~~of heightened sensitivity exist in the vicinity of the TRTP. They recommended that organizations and individuals on the NAHC contacts list for Kern and Los Angeles counties be consulted. Additional details on the proponent's efforts to consult concerned Native American representatives are presented in the Proponent's Environmental Assessment.

The Forest Service also conducted independent tribal consultation regarding the Project. In a letter dated August 31, 2007, the ANF invited 57 Native American representatives of 30 different tribal governments to comment on the TRTP as part of the scoping process for the EIR/EIS. To date, the ANF has received ~~one~~ two written responses; one from the Soboba Band of Luiseño Indians and the other from the

Gabrielino-Tongva Tribe. They both requested that they be included in continuing consultation as the Project proceeds, and that Native American monitors observe ground disturbing construction work. –In December 2008, and January and March 2009, the ANF conducted follow-up consultation with the tribes regarding the development of a Plan of Action for compliance with the Native American Graves Protection and Repatriation Act (NAGPRA) (see Section 3.5.3.1, below). In addition, the ANF invited the 57 Native American representatives of 30 different tribal governments to participate in a meeting held on April 18, 2009 at the ANF's Supervisors Office to discuss the Project.

Field Inventory of Cultural Resources

On behalf of SCE, Pacific Legacy, Inc. performed an archaeological survey of the proposed Project and alternatives between November 11, 2006, and April 4, 2007. (Pacific Legacy, 2007). Applied EarthWorks, Inc. (Æ) conducted supplemental field inspections between September 2007 and ~~December 2008~~May 2009 to augment the data collected by Pacific Legacy and examine alternatives to SCE's proposed Project identified subsequent to their survey, verify the locations of previously identified resources, assist with impact assessments, and cover previously unsurveyed lands within the APE. (Applied EarthWorks, 2009). In particular, Æ conducted field surveys of selected routing alternatives, temporary construction sites, helicopter staging areas, and other ancillary Project areas likely to be disturbed during construction but not identified at the time of the original surveys by Pacific Legacy. These selected surveys included the Chino Hills Routes A, B, C, C Modified, and D (Alternative 4), West Lancaster (Alternative 3), and underground and reroute elements of the 66-kV Subtransmission Alternative (Alternative 7), as well as sections of service/access roads to be upgraded during proposed Project activities along Segment 4 and several proposed temporary construction areas (wire setup sites) within Segment 10. In addition, Æ ~~surveyed seven~~investigated 13 helicopter staging areas proposed by SCE for Alternative 2 (SCE's Proposed Project) and ~~11~~ 13 helicopter staging areas proposed by the ANF for Alternative 6 (Maximum Helicopter Construction in the ANF). –In most areas the survey corridor measured 125 feet on either side of the existing transmission line, for a total width of 250 feet. In the ANF, however, the survey corridor expanded to 250 feet on either side of the transmission line, for a total width of 500 feet. Within these corridors, parallel survey transects were spaced no more than 12.2 meters (40 feet) apart. Cultural resources discovered during the surveys were documented using the standard State of California cultural resource records (DPR 523 forms). Records for previously recorded sites were updated using the same forms. A Trimble GeoExplorer XT global positioning system (GPS) unit was used to record site boundaries (calibrated to NAD 83).

As described in Sections 3.5.2.2 through 3.5.2.7 below, 135 archaeological and historical sites have been recorded within the APE of the proposed Project, with additional resources along some Project alternatives. Ninety-three of these sites were previously recorded, while forty-two were newly discovered during the archaeological survey. ~~Data provided by SCE's consultant~~SCE ~~did not consistently distinguish between previously recorded sites and those identified during surveys conducted specifically for the TRTP.~~ Approximately ~~40~~ 49 percent of the identified sites dated to the prehistoric era, while approximately ~~56~~ 47 percent were historical and ~~four~~three percent contained both prehistoric and historical components. Of the prehistoric archaeological sites, approximately 25 percent were habitation sites containing midden deposits while 50 percent were lithic tool and debris scatters. Other prehistoric site types included bedrock milling stations, hunting blinds, trails, quarries, and rock art.

Nearly half of the historic-era resources were roads, trails, or other transportation features. Approximately 15 percent were refuse scatters, while another 15 percent were associated with energy

generation or transmission. Other historical themes represented in the inventory include mining, ranching/farming, water distribution, and national defense. One historic district and one potential district also were identified.

3.5.2.1 Regional Setting

Prehistoric Cultural Setting

Archaeologists have defined a series of cultural traditions and periods for this region beginning at the end of the Pleistocene Period (~12,000 years before present [B.P.]) and running through the Contact Period (~A.D. 1700/300 B.P.). These periods are often overlapping in duration and regional distribution. The following is a summary of these periods. For a more detailed treatment of the prehistory of this region, the reader is directed to works such as Warren (2004) and Sutton (1988).

Terminal Pleistocene/PaleoIndian (12,000-10,000 B.P.)

Within the Western Mojave Desert region the Terminal Pleistocene/PaleoIndian period featured increasing post-glacial temperatures and unstable climates. Archaeologists hypothesize that the earliest occupants of the region led a foraging lifestyle focused around lakeshore or wetland environments (Davis 1978; Moratto 2004). Population density was presumably quite low. The toolkit included large lanceolate and fluted points (e.g., Clovis or Folsom) for hunting game, as well as crescents, gravers, scrapers, choppers, perforators, and numerous small formalized and informal flake tools (Davis 1978). Ground stone implements were rare, indicating that processed seeds or nuts did not play a significant dietary role. While no archaeological sites dating to this period have been noted within the study area, at least one Clovis style projectile point has been recovered from the nearby Tehachapi Mountains (Glennan 1987:26-27).

Early Holocene/Lake Mojave (10,000-7,000 B.P.)

As climatic conditions became warmer and more arid during the transition from the late Pleistocene to the early Holocene, human populations responded by focusing their subsistence efforts on a wider variety of faunal and floral resources. It is presumed that the adaptive strategy continued to be one of generalized hunting and gathering focused on the exploitation of wetland resources (Basgall and Hall 1993; Warren 1980, 1984). The Lake Mojave tool kit contains crescents, knives, scrapers, gravers and perforators (Earl et al. 1997), as well as the diagnostic Mojave and Silver Lake projectile points. While a Mojave point was recovered from the lower levels of site CA-KER-303 (within 0.25 mile of Project corridor) it was considered to be an anomaly (R.W. Robinson in Sutton 1988:32).

Pinto Period (7,000-4,000 B.P.)

In the desert regions of southern California, the Pinto Period succeeded the Lake Mojave Period, beginning at approximately 7000 B.P. and lasting to 4000 or 3500 B.P. Relatively recent paleoecological and paleohydrological evidence suggests maximum aridity in the desert regions between ca. 7000 and 5000 B.P., with amelioration beginning at approximately 5500 B.P. and continuing through 4000 B.P. (Spaulding 1991, 1995). During this period, it is believed that populations diminished and dispersed due to the decrease in permanent wetland habitats; thus, the Pinto Period reflects a settlement pattern in which the population relocated from the ancient lakeshores to seasonal water sources. As an adaptive response to these changing climatic conditions, greater emphasis was placed on the exploitation of plants and small animals than during the preceding Lake Mojave Period (Warren 1980, 1984). Sites dating to this period tend to be small temporary seasonal camps located near streams and seasonal water sources. They lack

developed middens but contain a diverse toolkit consisting of Pinto projectile points, large and small leaf-shaped bifaces, domed and heavy-keeled scrapers, numerous core/cobble tools, large blocky grinding slabs (metates) evincing minimal wear and small, thin, extensively used milling slabs, and shaped and unshaped handstones (manos). The appearance of milling tools indicates an increased reliance on seeds and nuts from the scrub and chaparral plant communities as wetland resources diminished. Rhyolite, fine-grained basalts, and poorer quality chert and quartz materials tend to dominate the lithic assemblages.

Gypsum Period (4000–1500 B.P.)

As a result of increased precipitation after 5000 B.P., modern vegetation and climate conditions were well established by 4300 B.P. Mesquite trees, oaks on the valley margins, and piñon were readily available; manos and milling slabs continued to be used, but mortars and pestles also were introduced to process mesquite pods, acorns, pine nuts, yuccas, and agaves. Large village sites appear in the archaeological record, reflecting a transition from seasonal migration to year-round or semi-sedentary settlement (Sutton 1988). In general, the projectile points of this cultural period are fairly large (dart point size), but also include more refined notched (Elko), concave base (Humboldt), and small stemmed (Gypsum) forms. In addition to diagnostic projectile points, Gypsum Period sites include leaf-shaped points, rectangular-based knives, flake scrapers, T-shaped drills, and occasionally, large scraper planes, choppers, and hammerstones (Warren 1984:416). Other artifacts include shaft smoothers, incised slate and sandstone tablets and pendants, bone awls, Olivella shell beads, and Haliotis beads and ornaments. A wide range of perishable items dating to this period was recovered from Newberry Cave, located along the Mojave River near the southern end of the Troy Lake Basin, including atlatl hooks, dart shafts and foreshafts, sandals and S-twist cordage, and tortoise-shell bowls. The presence of coastal marine shell artifacts (e.g., *Olivella* beads) and Coso obsidian indicate that long distance exchange systems were in place. Ritual activities also became important during the Gypsum Period, as evidenced by split-twig figurines (likely originating from northern Arizona), petroglyphs depicting hunting scenes, and elaborate mortuary rituals reflecting a high degree of social complexity.

Saratoga Springs Period (1500–800 B.P.)

Paleoenvironmental conditions were little changed from the preceding period, and throughout much of the California deserts cultural trends during the Saratoga Springs Period essentially continued Gypsum Period adaptations. Unlike the preceding period, however, the Saratoga Springs Period is marked by strong regional cultural developments, especially in the southern California desert area, which was heavily influenced by the Hakataya (Patayan) culture of the lower Colorado River (Warren 1984:421–422). The initial date for the first Hakataya influence on the southern Mojave Desert remains unknown; however, it does appear that by about 1000 to 1100 B.P. the Mojave Sink was heavily influenced, if not occupied by, lower Colorado River peoples.

Turquoise mining and long distance trade networks appear to have attracted both the Anasazi and Hakataya peoples into the California deserts from the east and southeast; these networks moved Buff and Brownware pottery and Cottonwood and Desert Side-notched projectile points from the interior to the coast in exchange for large quantities of shell beads and steatite items. Various other local products, including stone beads and schist and steatite ground stone artifacts, reflect the development of a regional stone trade. Schist and steatite stone workshops have been identified at habitation sites along Amargosa Creek west of Palmdale (Earle 2003).

Late Period (800–300 B.P.)

The Late Period saw the end of the obsidian trade an increased use of local cryptocrystallines. Earle (2003) suggests that changes in regional networks of raw material exchange may be associated with a drought episode (circa 850–650 B.P.) and the migration of Numic-speaking populations out of southeastern California. Global warming after 1000 B.P. Global warming between about 1,000 and 500 years ago also may have prompted cultural changes. Thereafter, and lasting throughout the ensuing Contact/Ethnographic Period, cooler temperatures and greater precipitation ushered in the Little Ice Age, during which time ecosystem productivity greatly increased along with the availability and predictability of water (Spaulding 2001).

With the return of wetter conditions around 500 B.P., there is some evidence of population increase in southern California and archaeological evidence indicates that the Late Period populations utilized a greater variety of subsistence resources, including both small and large mammals, and in some areas, fish. The continuation of milling technologies reflects a persistence of seed collecting, and the frequency of special purpose sites increases proportionally with a growing awareness of resource availability and potential (McIntyre 1990).

Contact Period/Ethnographic

When Europeans arrived in southern California, the western Mojave Desert, San Gabriel Mountains, and Eastern Los Angeles Basin were inhabited by at least three distinct cultural groups with the occasional presence of several others. These groups include members of the Kitanemuk, Tataviam, Vanyume, and Gabrieliño tribes.

At the northern end of the Project area, the Kitanemuk spoke a Takic language and inhabited the region along the southern foothills of the Tehachapi Mountains (Blackburn and Bean 1978). While no clearly identified Kitanemuk sites lie within the Project APE, CA-KER-303 appears to fall within the Kitanemuk area; no ethnic affiliation was made during investigations at that site. Along the south side of the Antelope Valley and into the San Gabriel Mountains lived the Tataviam, another Takic speaking people (King and Blackburn 1978). Several different tribes are thought to have shared the Antelope Valley proper, including the Kitanemuk to the north and the Vanyume/Serrano groups up from the Mojave River area. The Vanyume or Dessert Serrano, another Takic speaking tribe, came up from the Mojave River Region. The region from the eastern San Gabriel Mountains and south into the Los Angeles Basin was inhabited by the Gabrieliños, another Takic speaking group (Bean and Smith 1978). While no clearly identified Tataviam or Gabrieliño sites are noted within the Project APE, CA-LAN-1128/H could prove to be a village site associated with either of these tribal groups. The alternate routes of this Project that pass through the Chino Hills area pass near the Gabrieliño community of *Pashiinonga*, who's native population, along with most of these groups, was forcibly relocated to Mission San Gabriel Archangel in the late 1700s (McCawley 1996:48-49).

Historic Period

Spanish/Mexican Period (1760s-1848):

The Spanish development of Alta California began in earnest with the establishment of the chain of 21 Franciscan Missions stretching from San Diego to San Francisco The two Missions that most influenced the region through which the Project corridor passes are Mission San Gabriel Archangel (1771) and Mission San Fernando Rey de Espania (1797).

The first Europeans to enter the Antelope Valley were Spanish soldiers and missionaries exploring the interior of Alta California. In 1772, Captain Pedro Fages passed through the valley while searching for mission deserters; his expedition took him through the Tejon Pass and ultimately into the San Joaquin Valley. Four years later, Father Francisco Garces traveled through the Antelope Valley along the Mojave Indian Trail. California Historic Landmark No. 130 in Rosamond marks the location where the Franciscan friar stopped at Willow Springs (Tipton, 1988). By the 1800s, significant population reduction had occurred as Native populations were forcibly relocated to the above mentioned missions. American explorers and pioneers did not reach the Antelope Valley until the 1820s, when Jedediah Smith and Kit Carson led trapping expeditions into the region. They were followed by John Fremont in 1844.

In 1821, Mexico declared its independence from Spain. After this time the Missions were secularized and Mission lands were broken into large land grants and ranchos. Lumbering in the mountains and ranching in the valleys and basins characterize local resource exploitation during this period.

American Period (1848-Present)

With the end of the Mexican American War and the treaty of Guadalupe Hidalgo, California was ceded to the United States of America. California's accession to the union in 1850 led to several developments in the region. In 1854, Fort Tejon was established to protect the major north south throughway west of the Project area. The Butterfield Stage began service through the Antelope Valley in 1858. A telegraph line between Los Angeles and San Francisco was run through the region in 1860. Sparse ranches were established in the region throughout the 1860s.

With construction of the Southern Pacific Railway through the Antelope Valley in 1876, farming became popular in the area. The towns of Acton, Alpine (Palmdale), Lancaster, and Rosamond were established along the rail line. Ranching declined due to a series of severe droughts in the late 1800s, but the completion of the Los Angeles Aqueduct (CA-KER-3549H / CA-LAN-2105H) between the Owens Valley and Los Angeles in 1913 brought increased agriculture and ranching to the area.

Throughout the late eighteenth and nineteenth centuries, the San Gabriel Mountain region was used for a variety of commercial enterprises including lumbering, mining, herding stock, as well as for hunting, camping, and other recreation. Beginning in the 1770s, lumber was cut for the construction of the missions and later for the construction of the communities of the Los Angeles Basin. The first gold rush in the San Gabriel's was triggered by Francisco Lopez in 1842 (Robinson 1991:17). Early copper mining occurred in the Ravennna area of Soledad Canyon, and a few years latter (1857) northwest of Little Rock Reservoir (Earl 2003). Several historic mines are located in the Project vicinity, including the western adits of Falcon Mine (CA-LAN-2206H) where several hundred tons of gold were recovered between 1939 to 1942 (Robinson 1991:51) and the Gold Bar Mining Claim (CA-LAN-1315H). Cattle and sheep from ranches in the Los Angeles Basin used the mountains and higher reaches during times of drought throughout the 1800s and early 1900s.

Land in the eastern Los Angeles Basin was settled throughout the mid to late nineteenth century, beginning with El Monte, at the terminus of the Santa Fe Trail, in 1852. Rosemead was settled in the 1870s though its post office was not established until 1927; Pasadena was established shortly thereafter and received a post office in 1874, followed by Irwindale in 1899. Baldwin Park developed around the Pacific Electric Station in 1912 (Gudde 1988). The alternate routes of this Project that pass through the Chino Hills, cross grazing lands once foraged by the Frank Pellissier dairy cattle herd (1880s – 1940s) as well as the Rolling M Ranch, which was active from the late 1940s through the 1980s when the area was

purchased by the State of California for the Chino Hills State Park. Intensive agriculture and citrus groves began with the missions and culminated in the major commercial growing boom of the early 20th Century.

3.5.2.2 Alternative 2: SCE's Proposed Project

Archival research and pedestrian surveys conducted by Pacific Legacy (2007) and augmented by Applied Earthworks, Inc. (2009) identified 135 cultural resources within the APE of SCE's proposed Project (see Section 3.5.2 above for a description of the APE). Of these, ~~57~~ 66 date from prehistoric times, ~~73~~ 64 are from the historic period, and five contain both prehistoric and historical ~~remains.~~materials. Prehistoric cultural resources encompass a variety of site types including large villages and residential sites, smaller campsites, lithic scatters, milling stations and processing areas, and rock art sites. Historic cultural resources include roads and trails, structural remains, mines and mining related features, refuse dumps, and artifact scatters. Table 3.5-2 lists all cultural resources encountered within the APE of SCE's proposed Project. The table provides the numeric designation of each site (Smithsonian trinomial, State primary number, Forest Service number, and/or temporary field number), the period of association, and available information on National Register eligibility. Linear sites that intersect more than one segment of the proposed Project may be listed in the table more than once.

Table 3.5-2. Cultural Resources Inventory: Alternative 2

Segment	Temporary Designation	Trinomial	Primary	Forest Service	Period	National Register Eligibility
4	~~PL-SCE-Tehachapi-02H~~	CA-KER-303	P-15-000303		~~Historic~~Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-03/H~~	CA-KER-733	P-15-000733		Prehistoric~~/Historic~~	Not Evaluated
		CA-KER-~~303~~2172	P-15-~~000303~~002172		Prehistoric	Not Evaluated
		CA-KER-~~21723~~549H	P-15-~~0021720~~003549		~~Prehistoric~~Historic	~~Not Evaluated~~Recommended Eligible
	PL-SCE-Tehachapi-01H	CA-KER-~~733~~7214H	P-15-~~000733~~012793		~~Prehistoric~~Historic	Not Evaluated
	PL-SCE-Tehachapi-02H	CA-KER-7215H	P-15-012794		Historic	Not Evaluated
	PL-SCE-Tehachapi-07	CA-~~LAN-1783~~KER-7216	P-~~19-00178~~15-012795		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-08	CA-~~LAN-3795~~KER-7217	P-~~19-00379~~15-012796		Prehistoric	Not Evaluated
		CA-LAN-1783	P-19-~~003477~~001783		~~Historic~~Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-54H~~PL-SCE-Tehachapi-04~~	CA-LAN-3270			~~Prehistoric~~Historic	Not Evaluated

Table 3.5-2. Cultural Resources Inventory: Alternative 2

Segment	Temporary Designation	Trinomial	Primary	Forest Service	Period	National Register Eligibility
	~~PL-SCE-Tehachapi-06~~	CA-LAN-3477	P-19-003477		~~Prehistoric~~Historic	Not Evaluated
	PL-SCE-Tehachapi-~~07~~09	CA-LAN-3719	P-19-003719		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-~~08~~03H	CA-LAN-3723	P-19-003723		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-~~09~~04H	CA-LAN-3727	P-19-003727		Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-30H~~	CA-LAN-3795			~~Historic~~Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-~~54H~~ISO02		P-15-012781		~~Historic~~Prehistoric	Not ~~Evaluated~~Eligible
	PL-SCE-Tehachapi-~~ISO02~~ISO18		P-15-012792		Prehistoric	Not Eligible
	~~PL-SCE-Tehachapi-ISO17~~				~~Prehistoric~~	~~Not Eligible~~
	~~PL-SCE-Tehachapi-ISO18~~		P-19-186857	05015300243	~~Prehistoric~~Historic	Not ~~Eligible~~Evaluated
	PL-SCE-Tehachapi-06	~~CA-LAN-1636~~			Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-ISO17	~~CA-LAN-1770~~	~~P-19-001770~~		Prehistoric	Not ~~Evaluated~~Eligible
	AE-AVEC-6H				Historic	Not Evaluated
5		CA-LAN-~~1771~~806	P-19-~~001771~~000806		Prehistoric	Not Evaluated
		~~CA-LAN-1956~~	~~P-19-001956~~		~~Prehistoric~~	~~Not Evaluated~~
		CA-LAN-~~1957~~1636	P-19-~~001957~~001636		Prehistoric	Not Evaluated
		CA-LAN-~~806~~1770	P-19-001770		Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-13~~	CA-LAN-1771	P-19-001771		Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-14~~	CA-LAN-1956	P-19-001956		Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-16~~	CA-LAN-1957	P-19-001957		Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-17~~	CA-LAN-3385	P-19-003385		~~Prehistoric~~Historic	Not Evaluated

Table 3.5-2. Cultural Resources Inventory: Alternative 2

Segment	Temporary Designation	Trinomial	Primary	Forest Service	Period	National Register Eligibility
	~~PL-SCE-Tehachapi-18~~	CA-LAN-3477	P-19-003477		~~Prehistoric~~Historic	Not Evaluated
		CA-LAN-3653	P-19-~~003385~~003653		~~Historic~~Prehistoric	Not Evaluated
		CA-LAN-3655	P-19-~~003477~~003655		~~Historic~~Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-10H~~				~~Historic~~	~~Not Evaluated~~
	PL-SCE-Tehachapi-10H	CA-LAN-3729	P-19-003729	~~05015400076~~	Historic	Not Evaluated
	PL-SCE-Tehachapi-11H	CA-LAN-3733	P-19-003733		Historic	Not Evaluated
	PL-SCE-Tehachapi-12	CA-LAN-3734	P-19-003734		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-13	CA-LAN-3735	P-19-003735		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-14	CA-LAN-3736	P-19-003736		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-15	CA-LAN-3737	P-19-003737		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-16	CA-LAN-3738	P-19-003738		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-17	CA-LAN-3739	P-19-003739		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-18	CA-LAN-3740	P-19-003740		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-19	CA-LAN-3741	P-19-003741		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-20	CA-LAN-3742	P-19-003742		Prehistoric	Not Evaluated
			P-19-186857	05015300243	Historic	Not Evaluated
6				05015100148	Historic	Not Evaluated
				05015199008	Prehistoric	Not Eligible
				~~05015100156~~	~~Historic~~	~~Not Evaluated~~
			~~P-19-186877~~	~~05015500187~~	~~Historic~~	~~Not Evaluated~~
			~~P-19-186876~~	~~05015500186~~	~~Historic~~	~~Not Evaluated~~
		~~CA-LAN-1299~~	~~P-19-001299~~	~~05015100045~~	~~Prehistoric~~	~~Not Evaluated~~
		~~CA-LAN-1300~~	~~P-19-001300~~	~~05015100046~~	~~Prehistoric~~	~~Not Evaluated~~
		~~CA-LAN-1382~~	~~P-19-001382~~	~~05015500025~~	~~Prehistoric~~	~~Not Evaluated~~

Table 3.5-2. Cultural Resources Inventory: Alternative 2

Segment	Temporary Designation	Trinomial	Primary	Forest Service	Period	National Register Eligibility
		~~CA-LAN-2212~~	~~P-19-002212~~	~~05015100067~~	~~Prehistoric~~	~~Not Evaluated~~
		~~CA-LAN-2363~~	~~P-19-002363~~	~~05015500076~~	~~Prehistoric~~	~~Not Evaluated~~
		~~CA-LAN-2411~~	~~P-19-002411~~	~~05015500082~~	~~Prehistoric~~	~~Not Evaluated~~
		~~CA-LAN-3009~~	~~P-19-003009~~	~~05015500172~~	~~Prehistoric~~	~~Not Evaluated~~
		~~CA-LAN-3031~~	~~P-19-003031~~	~~05015100091~~	~~Prehistoric~~	~~Eligible~~
		~~CA-LAN-3032~~	~~P-19-003032~~	~~05015100094~~	~~Prehistoric~~	~~Eligible~~
			~~P-19-003018~~	~~05015100092~~	~~Prehistoric~~	~~Not Evaluated~~
			~~P-19-003025~~	~~05015500149~~	~~Prehistoric~~	~~Not Evaluated~~
			~~P-19-003136~~	~~05015100147~~	~~Prehistoric~~	~~Not Evaluated~~
				~~05015100148~~	~~Historic~~	~~Not Evaluated~~
				05015200133	Historic	Not Evaluated
				05015200136	Historic	Not Evaluated
		~~CA-LAN-1315H~~	~~P-19-001315~~	~~0501510002905~~015400076	Historic	Not Evaluated
		~~CA-LAN-1357H~~	P-19-~~001357~~003008	~~05015100018~~	~~Historic~~Prehistoric	Not Evaluated
		~~CA-LAN-2206H~~	~~P-19-002206~~	~~05015500048~~	~~Historic~~	~~Not Evaluated~~
			P-19-003037	05015100111	Historic	Not ~~Eligible~~Evaluated
			P-19-003562		Historic	Not Evaluated
			P-19-003606	05015400226	Historic	Not Evaluated
			P-19-~~120074~~120072	~~0501510009805~~015500184	Prehistoric/Historic	Not Evaluated
			P-19-120074	05015100098	Historic	Not Evaluated
			P-19-186545	05015500116; 05015500158	Historic	Not ~~Eligible~~Evaluated
			P-19-186875	05015500188	Historic	Not Evaluated
			P-19-186876	05015500186	Historic	Not Evaluated
			P-19-186917	05015200102	Historic	Not Evaluated
			P-19-186921	05015100102	Historic	Not Evaluated
			~~P-19-186925~~	~~05015500194~~	~~Historic~~	~~Not Evaluated~~
			P-19-187713	05015500185	Historic	Not ~~Eligible~~Eeligible
			P-19-186925	05015500194	Historic	Not Evaluated
		~~CA-LAN-1128/H CA-LAN-2131~~	P-19-~~001128~~187817	~~05015500006 0501550012005~~015100201	~~Prehistoric/~~Historic	Not Evaluated
		CA-LAN-1128/2131	P-19-~~120072~~001128	~~0501550018405~~015500006; 05015500120	Prehistoric/Historic	Not Evaluated
	~~LA-09-L~~	CA-LAN-1299	P-19-001299	05015100045	~~Historic~~Prehistoric	Not ~~Eligible~~Evaluated
	~~PL-SCE-Tehachapi-02~~	CA-LAN-1300	P-19-001300	05015100046	~~Historic~~Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-23H~~	CA-LAN-1315H	P-19-001315	05015100029	Historic	Not Evaluated

Table 3.5-2. Cultural Resources Inventory: Alternative 2

Segment	Temporary Designation	Trinomial	Primary	Forest Service	Period	National Register Eligibility
		CA-LAN-1357H	P-19-~~186917~~001357	~~05015200102~~05015100018	Historic	Not Evaluated
		CA-LAN-1362/H	P-19-001362		Prehistoric/Historic	Not Evaluated
	~~Woodland Duck Farm~~	CA-LAN-1382	P-19-001382	05015500025	~~Historic~~Prehistoric	Not ~~Eligible~~Evaluated
	~~Montebello Hills Oil Field~~	~~CA-LAN-2131~~	~~P-19-002131~~		~~Historic~~	~~Not Evaluated~~
		CA-LAN-2206H	P-19-~~100277~~002206	05015500048	Historic	Not ~~Eligible~~Evaluated
		CA-LAN-2212	P-19-002212	05015100067	Prehistoric	Not Evaluated
		CA-LAN-2213H	P-19-002213		Historic	Not Evaluated
		CA-LAN-2363	P-19-002363	05015500076	Prehistoric	Not Evaluated
		CA-LAN-2411	P-19-002411	05015500082	Prehistoric	Not Evaluated
		CA-LAN-3004	P-19-003004		Prehistoric	Not Evaluated
		CA-LAN-3018	P-19-003018	05015100092	Prehistoric	Not Evaluated
		CA-LAN-3025	P-19-003025	05015500149	Prehistoric	Not Evaluated
		CA-LAN-3031	P-19-003031	05015100091	Prehistoric	Not Evaluated
		CA-LAN-3032	P-19-003032	05015100094	Prehistoric	Not Evaluated
		CA-LAN-3136	P-19-003136	05015100147	Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-22	CA-LAN-3731	P-19-003731		Prehistoric	Not Evaluated
	LA-09-L				Historic	Not Evaluated
7			P-19-186917	05015200102	Historic	Not Evaluated
	Woodland Duck Farm				Historic	Not Eligible
	Montebello Hills Oil Field				Historic	Not Evaluated
8	PL-SCE-Tehachapi-05H	CA-LAN-3728	P-19-003728		Historic	Not Evaluated
	PL-SCE-Tehachapi-24H	CA-SBR-12570H	P-36-013390		Historic	Not Evaluated
	Irwin Grove and Structures				Historic	Not Evaluated
	Montebello Hills Oil Field				Historic	Not Evaluated
	John Briano Dairy				Historic	Not Evaluated

Table 3.5-2. Cultural Resources Inventory: Alternative 2

Segment	Temporary Designation	Trinomial	Primary	Forest Service	Period	National Register Eligibility
			~~P-19-100505~~		~~Prehistoric~~	~~Not Evaluated~~
			P-19-120031		Prehistoric	Not Evaluated
			P-19-120032		Prehistoric	Not Evaluated
			P-36-012533		Historic	Not Evaluated
			P-36-012621		~~H~~Historic	Not Evaluated
			P-36-012622		Historic	Not Evaluated
9	PL-SCE-Tehachapi-ISO02~~PL-SCE-Tehachapi-024H~~		P-15-012781		~~Historic~~Prehistoric	Not ~~Evaluated~~Eligible
		CA-LAN-3477	P-19-003477		Historic	Not Evaluated
			P-19-~~186870~~186857	~~05015100143~~	Historic	Not Evaluated
			P-19-~~187713~~186870	~~0501550018505015100143~~	Historic	Not ~~Eligible~~ Evaluated
			P-19-~~186876~~187713	~~0501550018605015500185~~	Historic	Not ~~Evaluated~~Eligible
	PL-SCE-Tehachapi-~~ISO02~~01H	CA-KER-7214H	P-15-012793		~~Prehistoric~~Historic	Not ~~Eligible~~Evaluated
10	~~PL-SCE-Tehachapi-25~~	CA-KER-3549H	P-15-0003549		~~Prehistoric~~Historic	Recommended Eligible~~Not Evaluated~~
		CA-KER-~~6340~~7038	P-15-~~010951~~012496		~~Historic~~Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-25	CA-KER-~~3549H~~7218	P-15-~~0003549~~012797		~~Historic~~Prehistoric	~~Eligible~~Not Evaluated
	PL-SCE-Tehachapi-26H	CA-KER-~~6937H~~7219H	P-15-~~012247~~012798		Historic	Not Evaluated
	PL-SCE-Tehachapi-34H	CA-KER-7226H	P-15-012805		Historic	Not Evaluated
	PL-SCE-Tehachapi-ISO06		P-15-012782		Historic	Not Eligible
	~~PL-SCE-Tehachapi-ISO07~~AP3-1005-1				Prehistoric	Not Eligible
11	~~PL-SCE-Tehachapi-ISO08~~			05015100006	~~Prehistoric~~Historic	Not ~~Eligible~~Evaluated
	~~PL-SCE-Tehachapi-ISO09~~			05015100063	~~Prehistoric~~Historic	Not ~~Eligible~~Evaluated
		~~CA-LAN-2350~~	~~P-19-002350~~	~~05015500069~~	~~Prehistoric~~	~~Not Evaluated~~
		~~CA-LAN-2412~~	~~P-19-002412~~	~~05015500083~~	~~Prehistoric~~	~~Not Evaluated~~
			~~P-19-002998~~	~~05015500166~~	~~Prehistoric~~	~~Not Evaluated~~

Table 3.5-2. Cultural Resources Inventory: Alternative 2

Segment	Temporary Designation	Trinomial	Primary	Forest Service	Period	National Register Eligibility
	~~PL-SCE-Tehachapi-22~~				~~Prehistoric~~	~~Not Evaluated~~
	~~PL-SCE-Tehachapi-35~~				~~Prehistoric~~	~~Not Evaluated~~
				~~05015100006~~	~~Historic~~	~~Eligible/listed~~
				~~05015100063~~	~~Historic~~	~~Not Evaluated~~
				05015100086	Historic	Not Evaluated
				05015100087	Historic	Not Evaluated
				05015100192	Historic	Not Evaluated
				05015100203	Historic	Eligible~~/listed~~
				~~05015500223~~	~~Prehistoric~~	~~Not Evaluated~~
				~~05015599014~~	~~Prehistoric~~	~~Not Eligible~~
			~~P-19-186925~~	~~050155001940~~5015500183	~~Historic~~Prehistoric	Not Evaluated
			P-19-002993		Prehistoric	Not Evaluated
			P-19-003037	05015100111	Historic	Not Evaluated
			P-19-003090	05015100123	Historic	Eligible
			P-19-003099	05015100114	Historic	Not Evaluated
			P-19-100439	05015599010	Prehistoric	Not Eligible
			P-19-100496	~~0501559901~~1050155921-IAO-01	Prehistoric	Not Eligible
	PL-SCE-Tehachapi-ISO10	~~CA-LAN-3152~~	P-19-~~003152~~100631	~~05015100037~~	~~Historic~~Prehistoric	Not Eligible
			~~P-19-003037~~	~~05015100111~~	~~Historic~~	~~Not Eligible~~
			~~P-19-003090~~	~~05015100123~~	~~Historic~~	~~Contributing element, Mt. Lowe Historic District~~
			~~P-19-003099~~	~~05015100114~~	~~Historic~~	~~Not Evaluated~~
			~~P-19-003638~~	~~05015100199~~	~~Historic~~	~~Not Evaluated~~
			P-19-180689	05015100128~~;~~ 05015100129	Historic	~~Contributing element, Mt. Lowe Historic District~~Eligible
			P-19-186860	05015100138	Historic	Not Evaluated
			P-19-186870	05015100143	Historic	Not Evaluated
			P-19-186871	05015100142	Historic	Not Evaluated
			P-19-186872	05015100144	Historic	Not Evaluated
			P-19-186873	05015100145	Historic	Not Evaluated
			P-19-186876	05015500186	Historic	Not Evaluated
			P-19-186877	05015500187	Historic	Not Evaluated
			P-19-186921	05015100102	Historic	Not Evaluated
			P-19-186923	~~05015100103~~	Historic	Not Evaluated
			P-19-~~187713~~186925	~~050155001850~~5015500194	Historic	Not ~~Eligible~~Evaluated
	~~PL-SCE-Tehachapi-02~~		P-19-187713	05015500185	Historic	Not ~~Evaluated~~Eligible
	~~PL-SCE-Tehachapi-21H~~		~~P-19-001880~~	~~05015500019~~	~~Historic~~	~~Not Evaluated~~
		CA-LAN-2343/H	P-19-002343	05015100073	Prehistoric/Historic	Eligible

Table 3.5-2. Cultural Resources Inventory: Alternative 2

Segment	Temporary Designation	Trinomial	Primary	Forest Service	Period	National Register Eligibility
	~~PL-SCE-Tehachapi-23H~~	CA-LAN-2350	P-19-002350	05015500069	~~Historic~~Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-33H~~	CA-LAN-2412	P-19-002412	05015500083	~~Historic~~Prehistoric	Not Evaluated
	~~PL-SCE-Tehachapi-ISO10~~	CA-LAN-2994	P-19-002994		Prehistoric	Not ~~Eligible~~Evaluated
		CA-LAN-~~2343H~~2995	P-19-~~002343~~002995	~~05015100073~~	Prehistoric~~/Historic~~	~~Eligible~~Not Evaluated
		CA-LAN-2996	P-19-002996		Prehistoric	Not Evaluated
		CA-LAN-2998	P-19-002998	05015500166	Prehistoric	Not Evaluated
		CA-LAN-3152	P-19-003152	05015100037	Historic	Not Evaluated
		CA-LAN-3295/H		05015500193	Prehistoric/Historic	Not Evaluated
	~~AE-TRTP-RSS-1~~	CA-LAN-3638	P-19-003638	05015100199	~~Prehistoric~~Historic	Not Evaluated
	PL-SCE-Tehachapi-33H	CA-LAN-3721	P-19-003721	05015500222	Historic	Not Evaluated
	PL-SCE-Tehachapi-35	CA-LAN-3722	P-19-003722	05015500223	Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-21H	CA-LAN-3730	P-19-003730		Historic	Not Evaluated
	PL-SCE-Tahachapi-22	CA-LAN-3731	P-19-003731		Prehistoric	Not Evaluated
	PL-SCE-Tehachapi-23H	CA-LAN-3732	P-19-003732		Historic	Not Evaluated
	AE-TRTP-RSS-1				Prehistoric	Not Evaluated
	AE-TRTP-3			Possibly 05015500235	Prehistoric	Not Evaluated
	AE-TRTP-ISO-1			Possibly 050155990011	Prehistoric	Not Eligible

3.5.2.3 Alternative 3: West Lancaster Alternative

Applied EarthWorks, Inc. performed a comprehensive pedestrian survey of the Project reroute proposed under Alternative 3, the West Lancaster Alternative, and did not identify any cultural resources. No known sites are avoided by this alternative and no additional previously recorded resources will be affected by the alternative in comparison to Alternative 2. Thus, the affected environment for Alternative 3 is identical to that described for Alternative 2 (SCE's proposed Project) (see Table 3.5-2).

3.5.2.4 Alternative 4: Chino Hills Route Alternatives

Applied EarthWorks, Inc. performed record searches at the South Central Coastal Information Center of the California Historical Resources Information System, Department of Anthropology, California State University, Fullerton to identify previously recorded resources along the Chino Hills alternatives in Orange and Los Angeles Counties. Æ also performed records searches at the San Bernardino Archeological Information Center, San Bernardino County Museum, Redlands to identify previously recorded resources along the Chino Hills alternatives in San Bernardino County. ~~One~~ Twenty-one prehistoric archaeological ~~site, four prehistoric isolates, and three~~resources, six historical sites, and two sites with both prehistoric and historical materials had been recorded previously within 0.25 mile of the Chino Hills Route Alternatives and all-weather access roads; however, only ~~one resource~~two resources had been identified previously within the 250-foot-wide APE. CA-SBR-3690/H is located along the Chino Hills Alternative B and contains both prehistoric and historic remains. CA-SBR-4033H, a historic site containing structures, a windmill, cattle pen and historical trash scatter, intersects the APE for Chino Hills Alternative D. In addition, ~~four~~three previously recorded sites (~~two~~one prehistoric lithic ~~scatters and two historical sites~~scatter, a historical road, and a historical ranch site with an extensive prehistoric component) are located along the three all-weather access routing options to the switching station.

Applied EarthWorks, Inc. performed pedestrian surveys of the ~~four~~five routing alternatives in Chino Hills from December 8 through 13, 2008~~.~~ and on 14 May 2009. These surveys ~~did not cover~~ covered the Aerojet property traversed by Alternative 4~~, nor were proposed~~ and Alternative 4C Modified, but not the all-weather access roads ~~covered during the survey.~~or the portion of Alternative 4 that lies outside Chino Hills State Park. Three previously undocumented historical sites and one isolated artifact were discovered and recorded during this survey; one of these is an oil well installation while the others are agricultural. Æ field teams also relocated CA-SBR-3690/H and updated the site record to include the historic elements of the site, which had not been recorded previously.

~~Five~~Two resources along Segment 8A to the west of the point where the Chino Hills Alternative Routes diverge from the proposed Project would be avoided if this alternative were selected. They are listed in Table 3.5-4. Thus, the affected environment for Alternative 4 includes ~~139~~143 cultural resources, encompassing those described for Alternative 2 above (see Table 3.5-2) as well as the additional resources listed in Table 3.5-3, but excluding those listed in Table 3.5-4. Of these, ~~58~~67 date from prehistoric times, ~~75~~69 are from the historic period, and ~~six~~ seven contain both prehistoric and historical remains. Most of the added resources are related to the historical themes of ranching and agriculture.

Table 3.5-3. Additional Cultural Resources Along Alternative 4

Temporary Designation	Trinomial	Primary	Period	National Register Eligibility
AE-1641-1H			Historic	Not Evaluated
AE-1641-2H			Historic	Not Evaluated
AE-1641-3H			Historic	Not Evaluated
AE-1641-4H			Historic	Not Eligible
	~~CA-SBR-3690~~	P-36-060021	Prehistoric~~/ Historic~~	Not ~~Evaluated~~Eligible
	CA-SBR-~~6021~~3690/H		Prehistoric/Historic	Not Evaluated
	CA-SBR-4033H	P-36-004033	Historic	Not Evaluated
	CA-SBR-~~5097H~~5097/H	P-36-005097	Prehistoric/Historic	~~Not Evaluated~~Eligible
	CA-SBR-6246H		Historic	Not Evaluated
	CA-SBR-~~5283~~7010H	P-36-007010	~~Prehistoric~~Historic	Not Evaluated

Table 3.5-4. Cultural Resources Avoided as a Result of Alternative 4 Reroutes				
Temporary Designation	Trinomial	Primary	Period	National Register Eligibility
		~~P-19-120032~~	~~Prehistoric~~	~~Not Evaluated~~
		~~P-36-012533~~	~~Historic~~	~~Not Evaluated~~
		P-36-012621	Historic	Not Evaluated
		~~P-36-012622~~	~~Historic~~	~~Not Evaluated~~
PL-SCE-Tehachapi-024H	CA-SBR-12570H	P-36-013390	Historic	Not Evaluated
~~PL-SCE-Tehachapi-05H~~			~~Historic~~	~~Not Evaluated~~

3.5.2.5 Alternative 5: Partial Underground Alternative

Alternative 5 follows existing alignments and does not diverge geographically from SCE's proposed Project (Alternative 2). As a result, the affected environment for Alternative 5 is identical to that described for Alternative 2 above (see Table 3.5-2).

3.5.2.6 Alternative 6: Maximum Helicopter Construction in the ANF Alternative

Alternative 6 was first developed in June and July 2008~~ and~~, expanded in October and November 2008~~.~~, and again in May 2009. To identify prior cultural resource surveys and previously identified archaeological and historical sites in the expanded APE for the Maximum Helicopter Alternative (i.e., at helicopter staging areas and landing zones, wire setup sites, and construction yards), Applied EarthWorks, Inc. conducted a records search at the South Central Coastal Information Center of the California Historical Resources Information System, housed at California State University, Fullerton, and the ANF, Arcadia, California. The records searches covered a one-half mile radius surrounding each of the proposed helicopter staging and work areas. Sixteen previously identified cultural resources are located within the proposed helicopter staging and construction areas, while 12 are located immediately adjacent and 80 more are within the half mile study radius.

Between July and ~~December 2008~~May 2009, Applied EarthWorks, Inc. performed cultural resource ~~surveys~~investigations of ~~18~~15 proposed helicopter staging areas~~, one wire setup site, and three construction yards. Three~~. Two proposed staging areas were subsequently eliminated, leaving ~~15~~13 staging areas under consideration, ~~ten~~five of which~~ (and all of the construction yards)~~ also would be used for helicopter construction under Alternative 2. A field crew composed of one or two archaeologists surveyed ~~each area~~ 14 of the 15 areas on foot using transects spaced at 10 to 15 meter intervals. One of the proposed sites (Site 13) overlapped an existing helicopter pad and a pedestrian survey of the area was not necessary. All landforms likely to contain prehistoric or historical resources were examined. Steep hillsides (greater than 25 degrees) were excluded from survey as they were deemed unlikely to contain cultural resources. As shown on Table 3.5-5, Æ relocated ~~16~~ 13 previously recorded cultural resources and discovered ~~five~~ four previously unrecorded ~~sites~~ (resources AE-TRTP-HP10, ~~TRTP-RSS-1, -~~Æ--TRTP-1, ~~-2, -~~3, and –ISO-1) in the staging areas~~ and other locations under consideration.~~. The ~~five~~four newly discovered resources include ~~four~~ two low density prehistoric lithic scatters, one historical lookout site, and one isolated obsidian flake, while the previously recorded resources include lithic scatters and temporary camps as well as ~~two~~one larger Native American habitation ~~sites.~~site. Historical sites are principally linear features such as trails, roads, and transmission lines, ~~several~~one of which ~~intersect~~intersects more than one staging area.

Of the ~~21~~ 17 identified resources, ~~14~~ 12 are also within the affected environment for Alternative 2 because they ~~also~~ intersect the main transmission corridor or are within staging areas that would be used during construction of either alternative. It remains to be determined whether any resources would be avoided by adoption of the Maximum Helicopter Alternative (Alternative 6). Thus, the affected environment for Alternative 6 contains ~~142~~ 140 cultural resources (69 prehistoric, 65 historical, and 6 with both prehistoric and historical remains), including those described for Alternative 2 above (see Table 3.5-2) as well as ~~seven~~ five additional resources listed in Table 3.5-5.

Table 3.5-5. Cultural Resources within or Immediately Adjacent to Alternative 6 Helicopter Staging Areas

Staging Area	Sites Designation	Period	National Register Eligibility
Site 1~~*~~	CA-LAN-1128/2131/H*	P/H	Not ~~evaluated~~Evaluated
Site 2	~~19-186925*~~AE-TRTP-3*	~~H~~P	Not ~~evaluated~~Evaluated
	AE-~~TRTP-3~~ISO-1*	P	Not ~~evaluated~~Eligible
	~~AE-ISO-1~~CA-LAN-2412*	P	~~Ineligible~~Not Evaluated
	CA-LAN-~~2412*~~3295/H*	P/H	Not ~~evaluated~~Evaluated
	~~AE-TRTP-1~~P-19-186876*	~~P~~H	Not ~~evaluated~~Evaluated
Site 3	AE-TRTP-~~2~~1	P	Not ~~evaluated~~Evaluated
	CA-LAN-2365	P	~~Ineligible~~Not Eligible
	0~~19-186921*~~5015500229	P/H~~H~~	~~Not evaluated~~Not Evaluated
Site 4	P-~~0501550003~~319-186921*	H	~~Ineligible~~Not Evaluated
	~~05015100205~~	~~P~~	~~Not evaluated~~
Site ~~7*~~ ~~SCE#6~~B6	~~LA-09-L*~~05015100205	~~H~~P	~~Ineligible~~Not Evaluated
	~~050151000156*~~P-19-120074*	H	Not ~~evaluated~~Evaluated
Site ~~8*~~ ~~SCE#3~~B7	~~19-186860*+~~LA-09-L*	H	Not ~~evaluated~~Eligible
	~~19-186877*~~	H	Not ~~evaluated~~
Site ~~9*~~ ~~SCE#7~~8	P-19-~~186917*+~~186860*	H	Not ~~evaluated~~Evaluated
Site ~~10~~9	P-19-~~187713~~186917*+	H	~~Ineligible~~Not Evaluated
Site ~~11*~~ ~~SCE#8~~10	P-~~10-186917*+~~19-187713*	H	Not ~~evaluated~~Eligible
	~~19-186921*+~~AE-TRTP-HP10	H	Not ~~evaluated~~Evaluated
~~SCE#2*~~Site 11	P-~~19-186876~~109-186917*+	H	Not ~~evaluated~~Evaluated
	~~19-186877*+~~	~~H~~	~~Not evaluated~~
~~SCE#3*~~	~~19-186876*+~~	~~H~~	~~Not evaluated~~
	~~19-186877*+~~	~~H~~	~~Not evaluated~~
~~SCE#4*~~	~~19-186871*~~	~~H~~	~~Not evaluated~~
~~SCE#6*~~	~~19-186877*+~~	~~H~~	~~Not evaluated~~
~~Marshalling Yard*~~	~~CA-LAN-3295/H*~~	~~P~~	~~Not evaluated~~
	~~TRTP-RSS-1*~~	~~P~~	~~Not evaluated~~
	~~19-186877*+~~	~~H~~	~~Not evaluated~~
	~~CA-LAN-2412*~~	~~P~~	~~Not evaluated~~
~~Fly yard*~~	~~19-187713*+~~	~~H~~	~~Ineligible~~
~~Assembly and Fly Yard*~~	~~19-186860*+~~	~~H~~	~~Not evaluated~~
	~~19-186877*+~~	~~H~~	~~Not evaluated~~

* also included in Alternative 2

+ linear site intersects multiple staging areas

3.5.2.7 Alternative 7: 66-kV Subtransmission Alternative

Alternative 7 was developed in August 2008~~.~~ and expanded in May 2009. In September 2008 Applied EarthWorks, Inc. performed a records search at the South Central Coastal Information Center of the California Historical Resources Information System, Department of Anthropology, California State University, Fullerton, to identify previously recorded resources along the Alternative 7 alignments in Los Angeles County. The records search revealed that ~~21~~26 archaeological and historical sites have been identified within 0.25 miles of the 66-kV subtransmission routes, including ~~three~~two Native American sites, four sites associated with the original Mission San Gabriel (Mission Vieja) or early post-mission settlement, two late nineteenth to early twentieth century residential sites, and several other historical buildings and structures. Historic commercial and industrial sites within 0.25 miles include six sites associated with late nineteenth to early twentieth century agriculture, the historic Montebello Hills Oil Field, the filming location for *The Birth of a Nation*, the Briano Winery, and the Woodland Duck Farm. In addition, the Whittier Narrows 66-kV Underground and Overhead reroute elements of Alternative 7 traverse the Whittier Narrows Archaeological District, which contains the Mission Vieja site, several early adobes and homesteads, and other important prehistoric and historical sites. –Roberts and Brock (1987) also note the high potential for the Narrows generally and areas along the San Gabriel River and Rio Hondo specifically to harbor buried archaeological deposits without surface indicators.

Applied EarthWorks, Inc. performed a field reconnaissance along the proposed underground and reroute alignments in Segments 7 and 8A to determine whether any of these resources would be affected by adoption of this alternative. Floods, fires, industrial and residential development, flood control projects, and other historical activities have all served to obscure the native ground surface in this area and limit the utility of archaeological surface surveys. As a result, the precise locations of several early historical sites have not been pinpointed, but both Roberts and Brock (1987) and Sundberg and Whitney-Desautels (1991) have concluded that the original Mission Vieja and Basye Adobe were located at the foot of the Montebello Hills overlooking Rio Hondo, which would place them within or close to the west-central portion of the Whittier Narrows 66-kV Overhead element of Alternative 7. As listed in Table 3.5-6, eight other cultural resources are located within 250 feet of this element, including the La Merced Adobe site and numerous other resources. Most of these have not been evaluated formally for significance. ~~One site, CA-LAN-1311/H, contains Native American remains as well as historical materials from both Mission and post-Mission times (Roberts and Brock 1987). Additionally, the~~ The Montebello Hills Oil Field ~~is~~and the Irwin Grove and Structures are within the APE of both Alternative 2 and Alternative ~~6~~7, and thus has been included in Table 3.5-2 above.

~~Five~~Three historical structures erected in the mid-1950s as part of the Audubon Center of Southern California, now the Whittier Narrows Nature Center (WNNC), are found along the Whittier Narrows 66-kV Underground element of Alternative 7 (Table 3.5-6). Strauss et al. (2007) evaluated these resources and concluded they were not significant or eligible for the NRHP or CRHR.

The Duck Farm 66-kV Underground element of Alternative 7 passes through the Woodland Duck Farm Site~~.~~, which is also within the APE of Alternative 2 and thus has been included in Table 3.5-2 above. Established at this location in 1951, the site includes seven standing buildings as well as remnants of several former farm buildings and agricultural features. Strauss (2007) evaluated the standing structures and archaeological remains of the Woodland Duck Farm and concluded that the Louise Ward Residence at 12936 Valley Boulevard in La Puente qualified for the CRHR because of its significant architectural characteristics; the remaining buildings and archaeological remains did not meet NRHP or CRHR

significance criteria. Strauss (2007) notes, however, that additional archaeological remains may be present at this site, and these could be significant if they retain integrity and clear historical associations.

~~Although none of these sites had been included in the original inventory of cultural resources for Alternative 2 (SCE's Proposed Project), the Montebello Hills Oil Field is within the Alternative 2 APE and therefore has been included in Table 3.5-2 above.~~ The affected environment for Alternative 7 thus includes the ~~16~~ 14 new sites listed in Table 3.5-6 as well as those described for Alternative 2 (SCE's proposed Project) above (see Table 3.5-2). No cultural resources are avoided as a result of the Alternative 7 re-routes or undergrounding.

Table 3.5-6. Additional Cultural Resources at Alternative 7

Temporary Designation	Trinomial	Primary	Period	Description	National Register Eligibility
Whittier Narrows 66-kV Overhead Element (Includes Option 1 and 2)					
	~~CA-LAN-1311/H~~		~~Prehistoric/ Historic~~	~~Native American and Mission period remains~~	~~Eligible~~
~~Mission Vieja Complex~~			~~Historic~~	~~Site of original Mission San Gabriel; location uncertain~~	~~Eligible~~
~~Basye Adobe Site~~			~~Historic~~	~~Mid-19th to mid-20th century commercial/residential~~	~~Eligible~~
~~La Merced Adobe~~			~~Historic~~	~~Mid-19th century homestead; location uncertain~~	~~Not Evaluated~~
~~Estratta Farm~~			~~Historic~~	~~Late 19th/early 20th century agriculture~~	~~Not Evaluated~~
~~Nutt Farm~~			~~Historic~~	~~Late 19th/early 20th century agriculture~~	~~Not Evaluated~~
~~Briano Winery~~			~~Historic~~	~~Late 19th/early 20th century commerce~~	~~Not Evaluated~~
Battista Ciocca Dairy			Historic	Early 20th century agriculture	Not Evaluated
Battista Ciocca Groves and Structures			Historic	Early 20th century agriculture and residential	Not Evaluated
Basye Adobe Site			Historic	Mid-19th to mid-20th century commercial/residential	Eligible
Briano Winery			Historic	Late 19th/early 20th century commerce	Not Evaluated
Early Oil Discoveries			Historic		Not Evaluated
Estratta Farm			Historic	Late 19th/early 20th century agriculture	Not Evaluated
Farmer Home			Historic	Early 20th century residence	Not Evaluated
La Merced Adobe			Historic	Mid-19th century homestead; location uncertain	Not Evaluated
Mission Vieja Monument			Historic	Site of original Mission San Gabriel; location uncertain	Eligible
Nutt Farm			Historic	Late 19th/early 20th century agriculture	Not Evaluated
Whittier Narrows 66-kV Underground Element					
		P-19-188114	Historic	WNNC Police Station	Not eligible
		P-19-~~188115~~188116	Historic	WNNC ~~Main Building~~Restroom	Not eligible
		~~P-19-188116~~	~~Historic~~	~~WNNC Restroom~~	~~Not eligible~~
		P-19-188117	Historic	WNNC Maintenance Garage and Shed	Not eligible
		~~P-19-188118~~	~~Historic~~	~~WNNC Picnic Shelter~~	~~Not eligible~~
Duck Farm 66-kV Underground Element					
Louise Ward Residence			Historic	Farm house	Eligible

3.5.3 Applicable Laws, Regulations, and Standards

3.5.3.1 Federal

National Historic Preservation Act (Section 106; 36 CFR Part 800) (NHPA)

The National Historic Preservation Act (NHPA) has become the foundation and framework for historic preservation in the United States. Briefly, the Act authorizes the Secretary of the Interior to expand and maintain a National Register of Historic Places (NRHP); it establishes an Advisory Council on Historic Preservation (ACHP) as an independent federal entity; it requires federal agencies to take into account the effects of their undertakings on historic properties and to afford the ACHP a reasonable opportunity to comment on any undertaking that may affect properties listed, or eligible for listing, in the NRHP; and it makes the heads of all federal agencies responsible for the preservation of historic properties owned or controlled by their agencies.

Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP. Undertakings include any federally funded, licensed, or permitted project.

To clarify the responsibilities of federal agencies with regard to Section 106 compliance, the ACHP has issued 36 CFR Part 800: Protection of Historic Properties, Regulations of the Advisory Council on Historic Preservation Governing the Section 106 Review Process. These regulations guide the implementation of Section 106. They identify the participants in the Section 106 compliance process; define key terms; and delineate the process of review and consultation. Revised regulations (36 CFR 800) were issued in 1999 to incorporate changes mandated by the 1992 Amendments of the NHPA. The regulations were further revised in August 2004.

Under the authority of Sections 101 and 110 of the NHPA, the National Park Service issued Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines. These standards are not regulatory, and they do not set or interpret agency policy, but they are "intended to provide technical advice about archeological and historic preservation activities and methods" [48 FR 44716]. Accordingly, the document presents standards and guidelines for preservation planning, identification of historic properties, evaluation of historic properties in keeping with four explicit standards, registration of historic properties, historical documentation, architectural and engineering documentation, and archaeological documentation. Importantly, the Standards and Guidelines also present minimal professional qualifications standards for history, prehistoric and historical archaeology, architectural history, architecture, conservation, cultural anthropology, curation, folklore, historic preservation, land use/community planning, landscape architecture, and traditional cultural property expertise. Although these proposed professional qualifications standards have not been adopted in final form, they are nonetheless widely applied in both federal and state historic preservation programs.

Archeological and Historic Preservation Act of 1974 (AHPA)

If a project will affect historic properties that have archeological value, the AHPA may impose additional requirements on an agency. Notifying the Department of the Interior that you are doing something under AHPA does not constitute compliance with Section 106.

Archeological Resources Protection Act of 1979 (ARPA)

If federal or Indian lands are involved, ARPA may impose additional requirements on an agency. ARPA prohibits unauthorized excavation on federal and Indian lands; establishes standards for permissible excavation; prescribes civil and criminal penalties for illicit artifact trafficking and other violations of the Act; requires agencies to identify archeological sites; and encourages cooperation between federal agencies and private individuals.

American Indian Religious Freedom Act of 1978 (AIRFA)

AIRFA affirms the right of Native Americans to have access to their sacred places. If a place of religious importance to American Indians may be affected by an undertaking, AIRFA promotes consultation with Indian religious practitioners, which may be coordinated with Section 106 consultation. Amendments to Section 101 of NHPA in 1992 strengthened the interface between AIRFA and NHPA by clarifying that properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined to be eligible for inclusion on the National Register. In carrying out its responsibilities under Section 106, a federal agency shall consult with any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to any such properties.

Native American Graves Protection and Repatriation Act of 1990 (NAGPRA)

For activities on federal lands, NAGPRA requires consultation with "appropriate" Indian tribes (including Alaska Native villages) or Native Hawaiian organizations prior to the intentional excavation, or removal after inadvertent discovery, of several kinds of cultural items, including human remains and objects of cultural patrimony.

In brief, NAGPRA requires agencies to: Inventory Native American cultural items; repatriate Native American cultural items; and consult with Native American groups about permits to excavate on federal or tribal lands.

For activities on Native American or Native Hawaiian lands, which are defined in the statute, NAGPRA requires the consent of the Indian tribe or Native Hawaiian organization prior to the removal of cultural items. The law also provides for the repatriation of such items from federal agencies and federally assisted museums and other repositories. NAGPRA defines Native American cultural items as human remains; associated funerary objects; unassociated funerary objects; objects of sacred value and cultural patrimony.

In 1992, amendments to NHPA strengthened NAGPRA by encouraging "protection of Native American cultural items . . . and of properties of religious or cultural importance to Indian tribes, Native Hawaiians, or other Native American groups" [Section 112(b)(3)] and by stipulating that a federal ". . . agency's procedures for compliance with Section 106 . . . provide for the disposition of Native American cultural items from federal or tribal land in a manner consistent with Section 3(c) of the Native American Graves Protection and Repatriation Act . . . ."

Executive Order 11593 (1971), Protection and Enhancement of the Cultural Environment

The federal government shall provide leadership in preserving, restoring and maintaining the historic and cultural environment of the Nation. This executive order (EO) addresses the NRHP and provides guidance to those involved with federal properties that should be inventoried and nominated for listing on the NRHP.

Executive Order 13007 (1996), Protection and Preservation of Native American Sacred Sites

This EO is meant to improve the management of these sites. The EO strives to protect and preserve Indian religious practices. Section 1 of the EO states that "In managing Federal lands, each executive branch agency with statutory or administrative responsibility for the management of Federal lands shall, to the extent practicable, permitted by law, and not clearly inconsistent with essential agency functions, (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies shall maintain the confidentiality of sacred sites."

Executive Order 13175 (2000), Consultation and Coordination with Indian Tribal Governments

This EO was issued to establish regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications; to strengthen the United States government-to-government relationships with Indian tribes; and to reduce the imposition of unfunded mandates upon Indian tribes. "Indian tribe" means an Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe pursuant to the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a. Relevant federal agencies are directed to establish policies and procedures for implementing consultation with federally recognized tribes on a government-to-government basis.

Executive Order 13287 (2003), Preserve America

This EO establishes, among other things, that it is the policy of the federal government to provide leadership in preserving America's heritage by actively advancing the protection, enhancement, and contemporary use of historic properties owned by the federal government, and by promoting intergovernmental cooperation and partnerships for the preservation and use of historic properties.

3.5.3.2 State

California Environmental Quality Act (CEQA)

In Section 21084.1 of the Public Resources Code, CEQA equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment. "Historical resources" include archaeological sites, historical buildings and other kinds of structures, historic district, cultural landscapes, and other properties listed in or eligible for listing in the California Register of Historical Resources (CRHR) and, by reference, the NRHP, California Historical Landmarks, Points of Historical Interest, and local registers. Any resource listed in, or eligible for listing in, the CRHR is presumed to be historically or culturally significant. A substantial adverse change is demolition, destruction, relocation, or alteration that would impair historical significance (Section 5020.1). Section 21084.1 further requires treatment of any substantial adverse change in the significance of a historical resource as a significant effect on the environment.

Health and Safety Codes

The disposition of human remains is governed by Section 7050.5 of the California HSC and Sections 5097.94 and 5097.98 of the PRC, and falls within the jurisdiction of the Native American Heritage Commission (NAHC). If human remains are discovered, the County Coroner must be notified ~~within 48 hours~~immediately and there should be no further disturbance to the site where the remains were found. If the remains are determined by the coroner to be Native American, the coroner is responsible for

contacting the NAHC within 24 hours. The NAHC, pursuant to Section 5097.98, will immediately notify those persons it believes to be most likely descended from the deceased Native Americans so they can inspect the burial site and make recommendations for treatment or disposal.

3.5.3.3 Local

- **Kern County (General Plan, Land Use/Conservation/Open Space Element)** promotes the preservation of cultural and historic resources (Kern County 2004).
- **Los Angeles County (General Plan, Land-Use Element, LU-A21)** provides for the preservation of its cultural resources in the Land-Use Element of the General Plan. This section describes new developments' responsibilities to the preservation of cultural heritage resources and the mitigation of damages that may incur (Los Angeles County 1993). Los Angeles County also has Local Plans tailored to fit specific un-incorporated areas of the county, and some of these also address historic preservation. The Antelope Valley General Plan (V17) addresses cultural resource preservation in its Policy Statements Element under Natural Resources. It provides for the protection of historic and archaeological resources and the mitigation of negative impacts by new developments (Los Angeles County 1986). The Antelope Valley General Plan includes the un-incorporated jurisdictions of Acton and Antelope Acres (Los Angeles County 1986).
- **San Bernardino County (General Plan, Conservation Element; County of San Bernardino Development Code, Chapter 82.12)** promotes the preservation of its cultural resources by providing for the preservation of cultural resources and mitigation of negative impacts from new developments. Additional regulations create a Cultural Resources Preservation Overlay district within which measures are laid out in detail to meet the goals of the Conservation Element (San Bernardino County 2007a; San Bernardino County 2007b).
- **The City of Baldwin Park (Municipal Code, Chapter 153, Baldwin Park Historic Resources Code)** designates the Planning Commission of the City of Baldwin Park as the Historic Resource Advisory Committee. This committee is responsible for upholding the Baldwin Park Historic Resource Code, including overseeing the preservation of cultural resources, the mitigation of negative impacts by new development, the maintenance of a Local Official Register of Historic Resources, and the creation of historic districts (City of Baldwin Park 2006).
- **The City of Chino (General Plan, Open Space Conservation Ordinance)** does not directly address cultural resources in its General Plan or Municipal Code; however, an Open Space Conservation Ordinance can be applied to historic resources (Chuck Coe, personal communication 2007).
- **The City of Duarte (Historic Preservation Element, General Plan)** outlines the city's goals for the preservation of cultural resources and the development of a Historic Resources Ordinance for the city (City of Duarte 2006).
- **The City of Industry (Historic Preservation Element, General Plan)** addresses cultural resources (Troy Helling personal communication).
- **The City of La Canada Flintridge** has no ordinances or General Plan Elements that directly address cultural resources; however, an Open Space Zone in its Municipal Code can be used to preserve historic areas (City of La Canada Flintridge).
- **The City of Lancaster (Plan for the Living Environment-Historical, Archaeological, and Cultural Resources)** addresses cultural resources in its 2020 General Plan. This plan outlines the policies for new development and mitigation of negative impacts on cultural resources (City of Lancaster 1997).
- **The City of Montebello (General Plan, Conservation Element)** recognizes the importance of historic preservation to Montebello and supports additional research into the city's history (City of Montebello 1975).
- **The City of Monterey Park (Municipal Code, Chapter 2.62, Historical-Heritage Commission; General Plan, Resources Element)** outlines the City of Monterey Park's preservation guidelines and the city's goal to preserve local resources (City of Monterey Park 2006; City of Monterey Park 2007).
- **The City of Ontario (Development Code, Article 26, Historic Preservation Ordinance; Local Historic Listing for Landmarks and Districts)** addresses the city's Historic Preservation Program and maintains a local list of historic landmarks and districts (City of Ontario 2002).

- **The City of Pasadena (Municipal Code, Title 2, Chapter 2.75; Zoning Code, Chapter 17.62)** outlines the organization and administration of the city's Historic Preservation Commission, which is responsible for designating historic resources as outlined in the Zoning Code (City of Pasadena 2005).
- **The City of San Gabriel (General Plan, Chapter 11)** lists known historic resources, outlines its Historic Preservation Ordinances, and suggests improvements to its existing preservation efforts. Title XV of the Municipal Code describes the procedures for designated historic buildings and enforces local, State and federal law (City of San Gabriel 2004; City of San Gabriel 1996).
- **The South El Monte Municipal Code, Chapter 17.78 (Historic Preservation)** addresses the creation of a Cultural Resources Management Commission with powers to designate historic buildings and enforce local, State and federal law (City of South El Monte 1995).
- **The Temple City General Plan, Resource Management Element** states that the city has no known cultural resources and has not been surveyed for cultural resources (Joe Lambert, personal communication 2007).
- **The City of Whittier (Municipal Code, Chapter 2.50; General Plan)** forms a Historic Resources Commission which oversees the city's policies towards historic preservation as laid out in its General Plan (City of Whittier 2006).

3.5.4 Impact Analysis Approach

3.5.4.1 Criteria for Determining Impact Significance

Cultural resources are places or objects that are important for historical, scientific, and religious reasons and are of concern to cultures, communities, groups, or individuals. These resources may include buildings and architectural remains, archaeological sites and other artifacts that provide evidence of past human activity, human remains, or traditional cultural properties.

In the context of a federally permitted undertaking, such as the TRTP, the responsible agency official must take into account the effects of the undertaking on historic properties (i.e., properties eligible for the NRHP). To be eligible for the NRHP, a resource must meet one or more of the criteria of significance (36 CFR 60.4) and retain integrity; such resources must be managed in compliance with the Advisory Council's regulations implementing Section 106 of the NHPA, found at 36 CFR 800.

CEQA, the State CEQA Guidelines, and the California Public Resources Code also contain provisions for the protection and preservation of significant cultural resources (i.e., "historical resources" and "unique archaeological resources"). State CEQA Guidelines §15064.5 provides criteria for assessing the significance of cultural resources parallel to the federal criteria. The State CEQA Guidelines also require consideration of unique archaeological sites (§15064.5) (see also Public Resources Code Section 21083.2[h]). –The ANF, U.S. Army Corps of Engineers (USACE), and CPUC have agreed that the eligibility criteria for listing a property in the NRHP (at 36 CFR Part 60.4) shall be the criteria used in determining the historical significance, and thus the NRHP or CRHR eligibility, of any cultural resources in the TRTP APE. Cultural resources in the APE that will be avoided and preserved in place need not be evaluated for NRHP/CRHR eligibility ~~provided that~~consistent with the Programmatic Agreement (PA) to be entered into by the ANF, USACE, SCE, CPUC, and ~~CPUC agree.~~SHPO.

Resources included in a local register of historical resources (pursuant to Section 5020.1(k) of the Public Resources Code), or identified as significant in an historical resources survey (meeting the criteria in Section 5024.1(g) of the Public Resources Code), also are considered "historical resources" for the purposes of CEQA. A resource must also retain the integrity of its physical identity that existed during its period of significance. Integrity is evaluated with regard to retention of location, design, setting, materials, workmanship, feeling, and association. Finally, under both federal and State law, Native American human remains and associated grave goods are granted special significance.

To satisfy CEQA requirements, conclusions are made regarding the significance of each identified impact that would result from the proposed Project and alternatives. Appropriate criteria have been identified and utilized to make these impact significance conclusions. The following significance criteria for cultural resources impacts were derived from previous environmental impact assessments and from the State CEQA Guidelines (Appendix G, Environmental Checklist Form, Section IX). Impacts of the proposed Project or alternatives would be considered significant and would require mitigation if:

- Criterion CR1: The Project would cause an adverse effect on a historic property or Traditional Cultural Property as defined by federal guidelines (as noted above, the ANF, USACE, and CPUC have agreed that the federal guidelines shall apply to all aspects of the Project and shall supersede State criteria for historical significance).
- Criterion CR2: The Project would cause a substantial adverse change in the characteristics of a cultural resource included in a local register of historical resources.
- Criterion CR3: The Project could uncover, expose, and/or damage Native American human remains.

Significance conclusions for individual impacts are not required for compliance with NEPA. Therefore, conclusions presented in the following analysis regarding the significance of identified impacts are provided for the purposes of CEQA and NHPA compliance only.

3.5.4.2 Applicant-Proposed Measures (APMs)

APMs were identified by SCE in the PEA. Table 3.5-7 presents the APMs that are relevant to the issue area of cultural resources. APMs are a commitment by the Applicant (SCE) and are considered part of the proposed Project. Therefore, the following discussions of impact analysis assume that all APMs will be implemented as defined in the table. Additional mitigation measures are recommended in this section if it is determined that APMs do not fully mitigate the impacts for which they are presented.

Table 3.5-7. Applicant-Proposed Measures – Cultural Resources

APM CR-1	Conduct an intensive archaeological inventory of all areas that may be disturbed during construction and operation of the Project. A complete cultural resource inventory of the Project area has been conducted. Should the Project change and areas not previously inventoried for cultural resources become part of the construction plan, SCE shall ensure that such areas are inventoried for cultural resources prior to any disturbance. All surveys shall be conducted and documented as per applicable laws, regulations, and guidelines and in accordance with professional standards.
APM CR-2	Avoid and minimize impacts to significant or potentially significant cultural resources wherever feasible. To the extent practical, SCE shall avoid or minimize impacts to archaeological resources, regardless of its CRHR or NRHP eligibility status. This includes siting all ground-disturbing activities defined in Section 4.6.5 and other Project components outside a buffer zone established around each recorded archaeological site within or immediately adjacent to the ROW. Because many archaeological resources comprise subsurface deposits, features, and artifacts, it may not be possible to recognize all potentially significant attributes of archaeological resources during archaeological testing. There is the potential for making unanticipated discoveries of previously unidentified remains at archaeological sites that could require efforts to reassess their CRHR or NRHP eligibility. Avoiding impacts or minimizing the area of an archaeological resource that could be affected during construction protects the resource and reduces the possibility that unanticipated discoveries would cause Project delays. SCE would avoid or minimize impacts to archaeological resources wherever practical by redesign, reroute, and implementation of avoidance procedures (i.e., establishing Environmentally Sensitive Areas), capping archaeological sites, or other protective measures within or immediately adjacent to access and spur roads that would be used during construction and operations activities. Impacts will be avoided or minimized through the following measures prior to construction.
APM CR-2a	Project Final Design shall avoid direct impacts to significant or potentially significant cultural resources. To the extent practical, all ground-disturbing activities defined in Section 4.6.5 and other Project components shall be sited to avoid or minimize impacts to cultural resources listed as, or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.

Table 3.5-7. Applicant-Proposed Measures – Cultural Resources	
APM CR-2b	~~Conduct a pre-construction Worker Education Program.~~Conduct a pre-construction Worker Education Program. SCE will design and implement a Worker Education Program that will be provided for all TRTP personnel who have the potential to encounter and alter unique archaeological sites, historical resources, or historic properties, or properties that may be eligible for listing in the CRHR or NRHP. This includes construction supervisors as well as field construction personnel. No construction worker will be involved in ground-disturbing activities without having participated in the Worker Education Program. The Worker Education Program shall include, at a minimum: • A review of applicable local, state and federal ordinances, laws and regulations pertaining to historic preservation • A discussion of disciplinary and other actions that could be taken against persons violating historic preservation laws and SCE policies • A statement by the construction company or applicable employer agreeing to abide by the Worker Education Program, SCE policies and other applicable laws and regulations • A review of archaeology, history, prehistory and Native American cultures associated with historical resources in the TRTP vicinity • A review of the SCE "Unanticipated Cultural Resources Discovery Plan" The Worker Education Program may be conducted in concert with other environmental or safety awareness and education programs for the TRTP, provided that the program elements pertaining to cultural resources is provided by a qualified instructor meeting applicable professional qualifications standards.
APM CR-2c	Establish and maintain a protective buffer zone around each recorded archaeological site within or immediately adjacent to the R-O-W. A protective buffer zone will be establish around each recorded archaeological site and treated as an "environmentally sensitive area" within which construction activities and personnel are not permitted. Monitoring will be conducted to ensure that the protective areas are maintained.
APM CR-3	~~Evaluate the significance of all cultural resources that cannot be avoided.~~Evaluate the significance of all cultural resources that cannot be avoided. Cultural resources that cannot be avoided and which have not been evaluated to determine their eligibility for listing in the CRHR or NRHP will be evaluated to determine their historical significance. Evaluation studies shall be conducted and documented as per applicable laws, regulations, and guidelines and in accordance with professional standards. Evaluation of properties will take into account attributes of each property that could contribute to its historical significance. Evaluation procedures will be consistent with applicable laws, regulations, and guidelines and in accordance with professional standards as follows.
APM CR-3a	Evaluate the significance of archaeological resources potentially eligible for CRHR or NRHP listing. Evaluation of archaeological sites would include scientific excavation of a sample of site constituents sufficient to understand the potential of a site to yield information to address important scientific research questions per CRHR eligibility Criterion 4 and NRHP eligibility Criterion D. Sites with rock art will be evaluated to consider their eligibility per CRHR Criterion 1, and NRHP Criterion A or C. Archaeological testing as part of resource evaluation will be carried out in portions of affected sites to recover an adequate sample of cultural remains that can be used to evaluated the significance of a site per CRHR eligibility Criterion 4 or NRHP Criterion D. Archaeological testing will involve scientific excavations; identification of recovered cultural and ecological remains; cataloging, scientific analysis, and interpretation of recovered materials; preparation of scientific technical reports and reports comprehensible to the general public discussing the archaeological program and its results. Reports of any excavations at archaeological sites will be filed with the appropriate Information Center of the California Historical Resources Information System.
APM CR-3b	~~Evaluate the significance of buildings and structures potentially eligible for CRHR or NRHP listing.~~Evaluate the significance of buildings and structures potentially eligible for CRHR or NRHP listing. Evaluation of buildings and structures would take into account engineering, aesthetic, architectural and other relevant attributes of each property. Buildings and structures will be evaluated for historical significance per CRHR eligibility Criteria 1, 2 and 3; NRHP criteria A, B, and C. A report of the evaluation of each building or structure will be prepared providing a rationale for an assessment of significance consistent with professional standards and guidelines. Reports of any significance evaluations of buildings and structures will be filed with the appropriate Information Center of the California Historical Resources Information System.
APM CR-3c	Consult Native Americans regarding traditional cultural values that may be associated with archaeological resources. Archaeological or other cultural resources associated with the TRTP may have cultural values ascribed to them by Native Americans. SCE will consult with Native Americans regarding evaluations of resources with Native American cultural remains.

Table 3.5-7. Applicant-Proposed Measures – Cultural Resources	
APM CR-4	Minimize unavoidable impacts to significant cultural resources, including Unique Archaeological Sites, Historical Resources, and Historic Properties. SCE will make reasonable efforts to avoid adverse Project effects to unique archaeological sites, historical resources, and historic properties. Nevertheless, it may not be possible to situate all TRTP facilities to completely avoid impacts to significant cultural resources. Impacts to significant cultural resources will be minimized by implementing the following measures.
APM CR-4a	Implement measures to minimize impacts to significant archaeological sites. Prior to construction and during construction, the following measures will be implemented by SCE to minimize unavoidable impacts to significant archaeological sites. • To the extent practical, all ground-disturbing activities defined in Section 4.6.5 and other Project components shall minimize ground surface within the bounds of unique archaeological sites, historical resources, or historic properties. • Portions of unique archaeological sites, historical resources, or historic properties that can be avoided will be protected as environmentally sensitive areas and will remain undisturbed by construction activities. • Monitoring by qualified professionals and/or Native Americans to ensure that impacts to sites are minimized will be carried out at each affected cultural resource for the period during which construction activities pose a potential threat to the site and for as long as there is the potential to encounter unanticipated cultural or human remains. • Additional archaeological study will be carried out at appropriate sites to ascertain if Project facilities could be located on a portion of a site and cause the least amount of disturbance to significant cultural materials. • Archaeological data recovery will be carried out in portions of affected significant sites to recover an adequate sample of cultural remains that can be used to address important research questions per CRHR eligibility Criterion 4 or NRHP Criterion D. Archaeological data recovery will involve scientific excavations; identification of recovered cultural and ecological remains; cataloging, scientific analysis, and interpretation of recovered materials; preparation of scientific technical reports and reports comprehensible to the general public discussing the archaeological program and its results. • Reports of any excavations at archaeological sites will be filed with the appropriate Information Center of the California Historical Resources Information System.
APM CR-4b	Implement measures to minimize impacts to significant buildings and structures. Prior to construction and during construction, SCE will implement the following measures to minimize unavoidable impacts to significant buildings and structures. • Locate TRTP facilities to minimize effects on significant buildings or structures. • Document significant architectural and engineering attributes consistent with National Park Service Historic American Buildings Survey/Historic American Engineering Record documentation standards. • File reports and other documentation with the National Park Service, if appropriate, and appropriate Information Center of the California Historical Resources Information System.
APM CR-5	Prepare and Implement a Construction Monitoring and Unanticipated Cultural Resources Discovery Plan. During construction it is possible that previously unknown archaeological or other cultural resources or human remains could be discovered. Prior to construction SCE will prepare a *Construction Monitoring and Unanticipated Cultural Resources Discovery Plan* to be implemented if an unanticipated discovery is made. At a minimum the plan shall detail the following elements: • Worker and supervisor training in the identification of cultural remains that could be found in the TRTP area • Worker and Supervisor response procedures to be followed in the event of an unanticipated discovery including appropriate points of contact for professionals qualified to make decisions regarding the potential significance of any find • Identification of persons authorized to stop or redirect work that could affect the discovery and their on-call contact information • Provide for monitoring of construction activities in archaeologically sensitive areas • Stipulate a minimum radius around any discovery within which work will be halted until the significance of the resource has been evaluated and mitigation implemented as appropriate • Procedures for identifying and evaluating the historical significance of any find • Procedures for consulting Native Americans in the process of identification and evaluation of significance of discoveries involving Native American cultural materials • Procedures to be followed for the treatment of discovered human remains per current state law and protocol developed in consultation with Native Americans

Table 3.5-7. Applicant-Proposed Measures – Cultural Resources	
APM CR-6	~~Inadvertent Discovery of Human Remains.~~Inadvertent Discovery of Human Remains. Any human remains discovered during Project activities will be protected in accordance with current state law as detailed in Technical Appendix I, specifically California Public Resources Code Sections 5097.91 and 5097.98, as amended. The discovery of human remains will be treated as defined in the *Construction Monitoring and Unanticipated Cultural Resources Discovery Plan*.
APM CR-7	~~Native American Participation.~~Native American Participation. Prior to construction SCE will consult with Native Americans identified by the NAHC as having cultural ties to particular areas of the TRTP. Native Americans will be consulted regarding their participation during significance evaluations and data recovery excavations at archaeological sites with Native American cultural remains, and monitoring during Project construction. Native Americans will be consulted to develop a protocol for working with each group should human remains affiliated with that group be encountered during Project activities.

3.5.4.3 Impact Assessment Methodology

For cultural resources, impact assessment is based on a comparison of known resource locations with the placement of ground disturbing Project activities that have the potential to remove, relocate, damage, or destroy the physical evidence of past cultural activities. If such ground disturbance overlaps recorded site locations, then a direct impact may occur. Historical buildings and structures may be directly impacted if the nearby setting and context is modified substantially, even if the building or structure itself is not physically affected. Indirect impacts may occur if activities occur near, but not directly on, known cultural resources.

For the TRTP, Applied EarthWorks, Inc. performed a GIS-based impact analysis using data on the locations of known sites and Project elements (ArcView shape files) provided by SCE, their subcontractors, and Aspen Environmental Group, augmented by field survey data collected by Æ. The accuracy of the analysis is dependent on the accuracy of the original GIS data. In most cases Æ did not verify site locations recorded in the field by SCE or its subcontractors.

3.5.5 Alternative 1: No Project/Action

No Project-related cultural resource impacts would result from Alternative 1 (no Project/Action) since the proposed facilities would not be built. Under Alternative 1, likely resource impacts within the Project area would be confined to natural erosion, disturbances associated with the routine maintenance of existing transmission lines and service roads, as well as periodic unauthorized surface artifact collecting or more severe site vandalism. However, additional cultural resource impacts may occur outside of the existing Project area as a result of efforts by others to interconnect and integrate new wind generation in the TWRA. Such additional impacts would be comparable to those anticipated for the proposed Project.

In the absence of the proposed Project, it is assumed that some currently unknown plan would be developed to provide the transmission upgrades necessary to interconnect renewable generation projects in the Tehachapi area and to address the existing transmission problems south of Lugo Substation. Similarly, other yet unspecified transmission upgrades presumably would be proposed in the future to provide the needed capacity and reliability to serve growing electrical load in the Antelope Valley. To interconnect wind projects in the Tehachapi area, it is possible that other electrical utilities with transmission facilities in the area, such as LADWP, might purchase some of the power from Tehachapi wind developers and integrate it into their system. Another possibility is for the development of a private transmission line, similar to the existing Sagebrush line that could connect wind projects to the electrical grid. This would involve combinations of upgrading existing transmission infrastructure or building new transmission facilities along different alignments than was assumed for the proposed Project and alternatives.

Construction methods, resulting impacts to cultural resources, and regulatory requirements associated with transmission projects that might occur without the proposed Project would be similar to those identified for the proposed Project. It is also assumed that the number of projects would most likely increase from a single project to several smaller projects that would be constructed in the same general area as the proposed Project with potentially overlapping construction schedules, in order to meet the RPS goals. The impacts of several smaller projects with overlapping timeframes would likely be greater than impacts associated with the proposed Project because of the probable need for increased transmission line miles and their associated roads, staging areas, and other ancillary facilities.

3.5.6 Alternative 2: SCE's Proposed Project

The APE for Alternative 2 includes 135 cultural resources. Of these, ~~24~~ 12 are isolated artifacts or other resources that have been evaluated and ~~judged~~determined ineligible for the National Register. These ~~24~~ 12 sites are not considered historic properties, and thus any effects on them are not considered significant impacts. ~~No further management consideration is warranted for these sites.~~

The remaining ~~111~~ 123 resources in the APE of Alternative 2 either have been evaluated and ~~judged~~determined significant historic properties, or have not been evaluated. Of these sites, ~~55~~ 79 sites may be affected by tower replacement, access roads, or other elements of the proposed Project. ~~These~~ potentially affected sites are listed in Table 3.5-8, which also shows their National Register status (eligible or unevaluated), project actions that may affect them (e.g., tower construction, use of existing road), and potential impact criteria (CR1 through CR3). Linear sites that intersect more than one segment of the proposed Project may be listed in the table more than once. Most of these sites are located along potential Project access roads~~; 14 are at known tower locations, ten are at wire setup sites, and three are at substations.~~. Only one site, CA-LAN-~~3795~~2343/H, located along an access road, has been evaluated and found eligible for the NRHP. CA-KER-3549H has been recommended eligible, but has not been formally evaluated, and the remaining sites are unevaluated.

3.5.6.1 Direct and Indirect Effects Analysis

Adverse effect on historic properties (Criterion CR1)

Impact C-1: Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places (NRHP).

Direct Effects

As shown on Table 3.5-8, properties that are eligible for the NRHP (i.e., "historic properties" as defined at 36 CFR 800.16(l)), as well as properties that may be eligible but have not been evaluated, occur within and near several tower sites and at other locations within or adjacent to the APE. Direct impacts are any ground-disturbing activities, including tower site preparation and construction, grading of new access or spur roads, reconductoring, tower removal, transportation, storage, and maintenance of construction equipment and supplies, staging area and material yard preparation and use, and use or improvement of existing access roads, that have the potential to disturb known cultural resources. Impacts could also result from inadvertent trespass out of designated work areas or roads.

Table 3.5-8. Alternative 2 (SCE's Proposed Project) Potentially Affected Cultural Resources

Segment	Site Designation	Forest Service Designation	Period	National Register Eligibility	Impact Criterion			Potential Impact				
					CR1	CR2	CR3	New Structure	Access Road		Wire Setup Site	Helipad/ Staging Area
									New	Existing		
4	CA-KER-303		P	Not Evaluated	X		X	X	X	X		
	CA-KER-733		P	Not Evaluated	X			X	X			
	CA-KER-3549H		H	Recommended Eligible	X			X		X		
	CA-KER-7216		P	Not Evaluated	X					X		
	CA-KER-7217		P	Not Evaluated	X			X		X		
	CA-LAN-1783		P	Not Evaluated	X					X		
	CA-LAN-3270			Not Evaluated	X					X		
	CA-LAN-3723		P	Not Evaluated	X				X	X		
	CA-LAN-3727		P	Not Evaluated	X			X	X	X		
	CA-LAN-3795			Not Evaluated	X					X		
	P-19-186857	05015300243	H	Not Evaluated	X				X			
5	CA-LAN-806		P	Not Evaluated	X			X		X		
	CA-LAN-3385		H	Not Evaluated	X			X		X		
	CA-LAN-3477		H	Not Evaluated	X			X		X		
	CA-LAN-3729		H	Not Evaluated	X			X		X		
	CA-LAN-3734		P	Not Evaluated	X			X				
	CA-LAN-3736		P	Not Evaluated	X					X		
	CA-LAN-3737		P	Not Evaluated	X			X		X		
	CA-LAN-3740		P	Not Evaluated	X			X		X		
	CA-LAN-3741		P	Not Evaluated	X			X				
	CA-LAN-3742		P	Not Evaluated	X					X		
	P-19-186857	05015300243	H	Not Evaluated	X			X		X		
6		05015100148	H	Not Evaluated	X					X		X
		05015200133	H	Not Evaluated	X					X		
		05015200136	H	Not Evaluated	X					X		
		05015400076	H	Not Evaluated	X			X		X		
	P-19-003008		P	Not Evaluated	X					X		
	P-19-003037	05015100111	H	Not Evaluated	X			X		X		
	P-19-003562		H	Not Evaluated	X					X		
	P-19-003606	05015400226	H	Not Evaluated	X			X		X		
	P-19-120072	05015500184	P/H	Not Evaluated	X					X		
	P-19-120074	05015100098	H	Not Evaluated	X			X		X		

Table 3.5-8. Alternative 2 (SCE's Proposed Project) Potentially Affected Cultural Resources

Segment	Site Designation	Forest Service Designation	Period	National Register Eligibility	Impact Criterion			Potential Impact				
					CR1	CR2	CR3	New Structure	Access Road		Wire Setup Site	Helipad/ Staging Area
									New	Existing		
	P-19-186545	05015500116; 05015500158	H	Not Evaluated	X			X		X		
	P-19-186875	05015500188	H	Not Evaluated	X					X		
	P-19-186876	05015500186	H	Not Evaluated	X			X		X		
	P-19-186917	05015200102	H	Not Evaluated	X			X		X		X
	P-19-186921	05015100102	H	Not Evaluated	X			X		X		
	P-19-186925	05015500194	H	Not Evaluated	X			X		X		
	P-19-187817	05015100201	H	Not Evaluated	X					X		
	CA-LAN-1128/2131	05015500006; 05015500120	P/H	Not Evaluated	X		X	X	X	X		
	CA-LAN-1362/H		P/H	Not Evaluated	X					X		
	CA-LAN-2206H	05015500048	H	Not Evaluated	X					X		
	CA-LAN-2213H		H	Not Evaluated	X					X		
	CA-LAN-2363	05015500076	P	Not Evaluated	X					X		
	CA-LAN-2411	05015500082	P	Not Evaluated	X					X		
	CA-LAN-3004		P	Not Evaluated	X					X		
	CA-LAN-3025	05015500149	P	Not Evaluated	X			X	X	X		
	CA-LAN-3031		P	Not Evaluated	X					X		
	CA-LAN-3136	05015100147	P	Not Evaluated	X			X		X		
	CA-LAN-3731		P	Not Evaluated	X					X		
7	P-19-186917	05015200102	H	Not Evaluated	X			X	X	X	X	
	Montebello Hills Oil Field		H	Not Evaluated	X			X		X		
8	John B Dairy		H	Not Evaluated	X					X		
	Montebello Hills Oil Field		H	Not Evaluated	X			X		X		
	CA-LAN-3728		H	Not Evaluated	X						X	
	P-36-012533		H	Not Evaluated	X					X		
	P-36-012621		H	Not Evaluated	X					X		
	P-36-012622		H	Not Evaluated	X			X				
9	No impacts											
10	CA-KER-7218		P	Not Evaluated	X			X	X		X	
	CA-KER-7219H		H	Not Evaluated	X			X				
	CA-KER-7226H		H	Not Evaluated	X			X	X			

Table 3.5-8. Alternative 2 (SCE's Proposed Project) Potentially Affected Cultural Resources

Segment	Site Designation	Forest Service Designation	Period	National Register Eligibility	Impact Criterion			Potential Impact				
					CR1	CR2	CR3	New Structure	Access Road		Wire Setup Site	Helipad/ Staging Area
									New	Existing		
11		05015100192	H	Not Evaluated	X			X		X		
		~~05015500033~~	~~H~~	~~Not Evaluated~~	~~X~~					~~X~~		
		05015500183	P	Not Evaluated	X					X		X
	P-19-002993		P	Not Evaluated	X					X		
	P-19-003037	05015100111	H	Not Evaluated	X					X		
	P-19-186860	05015100138	H	Not Evaluated	X			X		X		X
	P-19-186870	05015100143	H	Not Evaluated	X			X		X		
	P-19-186871	05015100142	H	Not Evaluated	X					X		
	P-19-186876	05015500186	H	Not Evaluated	X			X		X		
	P-19-186877	05015500187	H	Not Evaluated	X			X		X		X
	P-19-186921	05015100102	H	Not Evaluated	X			X		X		X
	P-19-186923		H	Not Evaluated	X					X		
	P-19-186925	05015500194	H	Not Evaluated	X			X		X		X
	~~CA-LAN-1880H~~	~~05015500019~~	~~H~~	~~Not Evaluated~~	~~X~~					~~X~~		
	CA-LAN-2343/H	05015100073	P/H	Eligible	X			X		X		
	CA-LAN-2350	05015500069	P	Not Evaluated	X					X		
	CA-LAN-2412	05015500083	P	Not Evaluated	X					X		
	CA-LAN-2994		P	Not Evaluated	X					X		
	CA-LAN-2995		P	Not Evaluated	X					X		
	CA-LAN-2996		P	Not Evaluated	X					X		
	CA-LAN-2998	05015500166	P	Not Evaluated	X					X		
	CA-LAN-3152	05015100037	H	Not Evaluated	X					X		
	CA-LAN-3295/H	05015500193	P/H	Not Evaluated	X			X				
	CA-LAN-3722	05015500222	H	Not Evaluated	X					X		
	CA-LAN-3731		P	Not Evaluated	X					X		
	~~CA-LAN-3295/H~~	~~05015500193~~	~~P/H~~	~~Not Evaluated~~	~~X~~			~~X~~				
	AE-TRTP-RSS-1		P	Not Evaluated	X			X				
	AE-TRTP-3		P	Not Evaluated	X			X				

Adverse effects to individual sites cannot be precisely identified until the final tower locations are defined, specific tower sites are determined, detailed engineering plans for all Project roads and facilities are completed, the precise relationship of these Project elements to known sites is determined, and final NRHP eligibility of affected cultural resources has been evaluated; thus planning for these activities must account not only for sites determined eligible for the NRHP, but also for unevaluated sites.

If direct impacts to these sites cannot be avoided, the CPUC, Forest Service, and the USACE, in consultation with the California SHPO, would make a final determination of adverse effect. Since this is a complex undertaking that will be built in phases, and since the CPUC, a non-federal agency, has decision-making responsibilities, the Forest Service, USACE, CPUC, and SCE will execute a Programmatic Agreement (PA) with the SHPO that will guide the resolution of adverse effects to historic properties.

Indirect Effects

Indirect impacts may occur to properties eligible for the NRHP within and in the vicinity of the Project APE during ~~operation~~operation and long-term presence of the proposed Project. Increased erosion could result as an indirect Project impact. This impact is potentially significant, but can be mitigated to a level that is less than significant by implementing site protection measures and monitoring ~~procedures~~procedures, as detailed in Mitigation Measure C-1i (Protect and monitor NRHP-eligible properties), described below.

Mitigation Measures for Impact C-1

C-1a **Development and Execution of a Programmatic Agreement (PA).** Since the Project's effects on historic properties cannot be fully determined before the Project has been approved, and the CPUC is a non-federal agency with decision-making responsibilities, the Forest Service, USACE, CPUC, and SCE, along with the Advisory Council on Historic Preservation if they choose to participate, will develop and execute a PA for the TRTP with the SHPO in accordance with 36 CFR 800.14(b)(ii) and (iii). The PA will guide the resolution of adverse effects to and management of historic properties. Consultation to develop the PA will follow 36 CFR 800.6. The PA will contain minimum standards and guidelines for identifying historic properties and evaluating their significance. It will include requirements for development and implementation of Historic Properties ~~Treatment~~/Historical Resources Management Plans, Construction Phase Management Plans, archaeological monitoring, reporting, professional qualifications, artifact curation, Native American consultation, treatment of human remains, discovery of unknown cultural resources, cost, dispute resolution, amendment, termination, confidentiality, annual meetings, and duration.

C-1b **Inventory cultural resources in the APE.** APM CR-1 calls for intensive archaeological inventories of areas that may be disturbed by construction. –As described in Section 3.5.2, cultural resource inventories have been completed for most of the APE. –However, some elements of the Project remain undefined and additional inventories may be necessary. Prior to construction and all other surface disturbing activities, SCE shall submit cultural resources inventory reports to the Forest Service, USACE, and CPUC for any portions of the APE which have not been inventoried previously, including but not limited to existing and newly proposed access and spur roads, construction turn-arounds, guard pole locations, marshalling yards, wire setup areas, helicopter staging areas, helicopter landing zones, and any other projected areas of potential ground disturbance outside of the previously surveyed areas. The nature and extent of additional inventory shall be determined by the Forest Service, USACE, and CPUC in consultation with the State Historic Preservation Officer (SHPO). ~~and shall be based upon Project engineering specifications.~~ Results of these inventories shall also be filed with ~~all affected local~~

~~governments and~~ the appropriate Information Centers of the California Historical Resources Information System. Site-specific field surveys also shall be undertaken at all projected areas of impact within the previously surveyed corridor that coincide with previously recorded resource locations to further refine the assessment of potential Project effects. The selected tower locations and other direct impact areas shall be staked prior to the cultural resource field surveys.

C-1c **Avoid and protect resources.** APMs CR-2, CR-2a, and CR-2c call for avoidance of impacts through Project redesign or use of protective buffer zones. The Forest Service, USACE, and CPUC may require the relocation of transmission lines, ancillary facilities, or temporary facilities or work areas, if any, where relocation would avoid or reduce damage to cultural resource values. Where operationally feasible, NRHP-eligible resources shall be protected from direct Project impacts by Project redesign and inclusion of sites in exclusion areas.

All cultural resources that will not be impacted directly but are within 50 feet of direct impact areas shall be designated as Environmentally Sensitive Areas (ESAs). Protective fencing or other markers, at the Forest Service, USACE, or CPUC's discretion, shall be erected and maintained to protect ESAs from inadvertent trespass for the duration of construction in the vicinity. Construction personnel and equipment shall be instructed on how to avoid ESAs. ESAs shall not be identified specifically as cultural resources. A monitoring program shall be developed as part of the Historic Properties Treatment Plan (see Mitigation Measure C-1e, Develop and implement a Historic Properties Treatment Plan) and implemented by the SCE to ensure the effectiveness of ESAs.

C-1d **Evaluate the significance of cultural resources that cannot be avoided.** APMs CR-3, CR-3a, and CR-3b call for formal significance evaluation of archaeological sites and historical buildings and structures that cannot be avoided during construction. APM CR-3c calls for consultation with Native Americans regarding traditional cultural values that may be associated with archaeological sites. Where the Forest Service, USACE, and/or CPUC decide that cultural resources cannot be protected from direct impacts by Project redesign or avoidance, SCE shall undertake additional studies to evaluate the resources' NRHP eligibility and to recommend further treatment, if necessary. The nature and extent of this evaluation shall be determined by the Forest Service in consultation with the USACE, CPUC, SCE, and the SHPO ~~and shall be based upon final Project engineering specifications.~~. Consultation shall include direct contact with Native American tribal representatives to seek their views on ~~resource~~the significance~~.~~ of resources having a Native American component. Significance evaluations will be based on surface remains, subsurface testing, archival and ethnographic resources, and in the framework of the historic context and research questions important to the general Project area. Results of those evaluation studies and recommendations for mitigation of Project effects shall be incorporated into a Historic Properties Treatment Plan consistent with Mitigation Measure C-1e (Develop and implement a Historic Properties Treatment Plan).

C-1e **Develop and implement Historic Properties/Historical Resources Treatment Plan.** Upon Forest Service, USACE, and CPUC approval of the inventory report and the NRHP eligibility evaluations, consistent with Mitigation Measures C-1b (Inventory cultural resources in the Final APE), C-1c (Avoid and protect resources), and C-1d (Evaluate the significance of cultural resources that cannot be avoided), SCE shall prepare and submit for approval a Historic Properties Treatment Plan (HPTP) ~~for NRHP~~or Historical Resources Management Plan (HRMP) for NRHP/CRHR -eligible cultural resources to mitigate or avoid identified impacts. Treatment of cultural resources shall follow the procedures established by the Advisory Council on Historic Preservation for compliance with Section 106 of the National Historic Preservation Act and the Secretary of Interiors Standards and Guidelines for the Treatment of Historic Properties.

Mitigation alternatives may include, but are not limited to, avoidance, recordation, additional analysis of existing collections, and data recovery excavation. The HPTP or HRMP (herein HP/HRMP) shall be submitted to the Forest Service, USACE, and CPUC for review and approval.

As part of the ~~HPTP~~HP/HRMP, SCE shall prepare a research design and a scope of work for data recovery or additional treatment of significant sites that cannot be avoided. Data recovery on most resources would consist of sample excavation and/or surface artifact collection, and site documentation. A possible exception would be a site where human remains or sacred features are discovered that cannot be avoided.

The ~~HPTP~~HP/HRMP shall define and map all known significant properties ~~in or within 50 feet of all areas~~ affected, or potentially affected, by the Project, and shall identify the cultural values that contribute to their eligibility for the NRHP. A ~~cultural resources protection plan~~Construction Phase Management Plan shall be included that details how ~~eligible properties~~ cultural resources will be avoided and protected during construction~~.~~, in accordance with the PA. Measures shall include, at a minimum, designation and marking of Environmentally Sensitive Areas (ESAs), archaeological monitoring, personnel training, and effectiveness reporting. The plan shall detail what measures will be used; how, when, and where they will be implemented; and how protective measures and enforcement will be coordinated with construction personnel.

The ~~HPTP~~HP/HRMP shall also define any additional areas that are considered to be of high-sensitivity for discovery of buried NRHP-eligible cultural resources, including burials, cremations, or sacred features. The ~~HPTP~~HP/HRMP shall detail provisions for monitoring construction in these high-sensitivity areas. It shall also detail procedures for halting construction, making appropriate notifications to agencies, officials, and Native Americans, assessing NRHP-eligibility in the event that unknown cultural resources are discovered, and the timelines for assessing NRHP-eligibility, formulating a mitigation plan, and implementing treatment. Treatment plans for unanticipated discoveries shall be approved by the Forest Service, USACE, ~~and CPUC, appropriate local governments~~CPUC, appropriate Native Americans, and the SHPO prior to implementation.

The ~~HPTP~~HP/HRMP shall include provisions for analysis of data in a regional context, reporting of results within one year of completion of field studies, and curation of artifacts and data (maps, field notes, archival materials, recordings, reports, photographs, and analysts' data) at a facility that is approved by Forest Service, USACE, and CPUC, and dissemination of reports to local and State repositories, libraries, and interested professionals. The Forest Service will retain ownership of artifacts collected from Forest Service managed lands. SCE shall attempt to gain permission for artifacts from privately held land to be curated with the other Project collections. The ~~HPTP~~HP/HRMP shall specify that archaeologists and other discipline specialists conducting the studies meet the Secretary of the Interior's Professional Qualifications Standards (per 36 CFR 61).

C-1f **Conduct data recovery excavation or other actions to reduce adverse effects.** If NRHP eligible resources, as determined by the CPUC, Forest Service, USACE, and SHPO, cannot be protected from direct impacts of the Project, SCE shall implement data-recovery investigations ~~shall be conducted by SCE~~or other actions to reduce adverse effects to the characteristics of each property that ~~contribute to its~~make it eligible for the NRHP ~~eligibility.~~. For archaeological sites eligible under Criterion d, significant data would be recovered through excavation and analysis. For properties eligible under Criteria a, b, or c, ~~data recovery~~treatment may include historical documentation, photography, collection of oral histories, architectural or engineering documentation, preparation of a scholarly work, or some form of public awareness or interpretation. ~~Data~~Information gathered during the evaluation phase and the research design

element of the ~~Historic Properties Treatment Plan (HPTP)~~HP/HRMP shall guide plans and data thresholds for data recovery; treatment will be based on the resource's research potential beyond that realized during resource recordation and evaluation studies. If data recovery excavation is necessary, ~~sampling for data recovery excavations will follow standard statistical~~appropriate sampling methods~~, but sampling~~ will be proposed. Sampling will be confined, as much as possible, to the direct impact area. Data-recovery methods, sample sizes, and procedures shall be detailed in the ~~HPTP~~HP/HRMP consistent with Mitigation Measure C-1e (Develop and implement Historic Properties/Historical Resources Treatment Plan) and implemented by SCE only after approval by the Forest Service, USACE, and CPUC. Following any field investigations required for data recovery, SCE shall document the field studies and findings, including an assessment of whether adequate data were recovered to reduce adverse Project effects, in a brief field closure report. The field closure report shall be submitted to the Forest Service, USACE, and CPUC for their review and approval, as well as to the appropriate State repositories and local governments. Construction work within 100 feet of cultural resources that require data-recovery fieldwork shall not begin until authorized by the Forest Service, USACE, or CPUC, as appropriate.

C-1g **Conduct cultural resources monitoring.** APM CR-5 calls for preparation of a construction monitoring and inadvertent discovery plan. A professional archaeologist shall monitor subsurface construction disturbance at all locations identified in the ~~HPTP~~HP/HRMP where monitoring is required (see Mitigation Measure C-1e, Develop and implement a Historic Properties/Historical Resources Treatment Plan). ~~Full-time monitoring shall occur when ground disturbance takes place at all archaeological High Sensitivity Areas described above and at all cultural resource Environmentally Sensitive Areas (ESAs).~~ These locations and their ~~protection~~ boundaries shall be defined and mapped in the ~~HPTP.~~HP/HRMP. Intermittent monitoring may occur in areas of moderate archaeological sensitivity at the discretion of the Forest Service, USACE, and/or CPUC. Archaeological monitoring shall be conducted by a qualified archaeologist familiar with the types of historical and prehistoric resources that could be encountered within the Project APE, and under direct supervision of a principal archaeologist. The qualifications of the principal archaeologist and archaeological monitors shall be approved by the Forest Service, USACE, and CPUC. A Native American monitor may be required at culturally sensitive locations. ~~specified by the Forest Service, USACE, or CPUC following government to government consultation with Native American tribes. The monitoring plan in the HPTP shall indicate the locations where Native American monitors will be required and shall specify the tribal affiliation of the required Native American monitor for each location.~~ SCE shall retain and schedule any required Native American monitors.

Compliance with and effectiveness of the cultural resources monitoring plan shall be documented by SCE in a monthly report to be submitted to the Forest Service, USACE, and CPUC, for the duration of Project construction. In the event that cultural resources are not properly protected by ESAs, all Project work in the immediate vicinity shall be diverted by the archaeological monitor until authorization to resume work has been granted by the Forest Service, USACE, and CPUC. SCE shall notify the Forest Service of any damage to cultural resource ESAs. SCE shall consult with the Forest Service, USACE, and CPUC to mitigate damages and to increase effectiveness of ESAs. At the discretion of the Forest Service, USACE, and CPUC, such mitigation may include, but not be limited to modification of protective measures, refinement of monitoring protocols, data-recovery investigations, or payment of compensatory damages in the form of non-destructive cultural resources studies or protection.

C-1h ~~Train construction personnel to identify cultural resources.~~**Workers Environmental Awareness Program**. APM CR-2b calls for a pre-construction worker education program. All construction

personnel shall be trained regarding the recognition of possible buried cultural remains and protection of all cultural resources, including prehistoric and historic resources during construction, prior to the initiation of construction or ground-disturbing activities. SCE shall complete training for all construction personnel. Training shall inform all construction personnel of the procedures to be followed upon the discovery of archaeological materials, including Native American burials. Training shall inform all construction personnel that Environmentally Sensitive Areas (ESAs) must be avoided and that travel and construction activity must be confined to designated roads and areas. All personnel shall be instructed that unauthorized collection or disturbance of artifacts or other cultural materials on or off the ROW by SCE, their representatives, or employees will not be allowed. Violators will be subject to prosecution under the appropriate State and federal laws and violations will be grounds for removal from the Project. Unauthorized resource collection or disturbance may constitute grounds for the issuance of a stop work order. The following issues shall be addressed in training or in preparation for construction:

- All construction contracts shall include clauses that require construction personnel to attend training so they are aware of the potential for inadvertently exposing buried archaeological deposits, their responsibility to avoid and protect all cultural resources, and the penalties for collection, vandalism, or inadvertent destruction of cultural resources.
- SCE shall provide a background briefing for supervisory construction personnel describing the potential for exposing cultural resources, the location of any potential ESA, and procedures and notifications required in the event of discoveries by Project personnel or archaeological monitors. Supervisors shall also be briefed on the consequences of intentional or inadvertent damage to cultural resources. Supervisory personnel shall enforce restrictions on collection or disturbance of artifacts or other cultural resources.
- Upon discovery of potential buried cultural materials by archaeologists or construction personnel, or damage to an ESA, work in the immediate area of the find shall be diverted and SCE's archaeologist notified. Once the find has been inspected and a preliminary assessment made, SCE's archaeologist will consult with the Forest Service, USACE, or CPUC, as appropriate, to make the necessary plans for evaluation and treatment of the find(s) or mitigation of adverse effects to ESAs.

SCE shall provide to the CPUC, USACE, and Forest Service a list of construction personnel who have completed the cultural resources identification training prior to start of construction, and this list shall be updated by SCE as required when new personnel start work. No construction worker may work in the field ~~for more than 5 days~~ without first participating in the ~~cultural resources identification training~~Environmental Awareness Training.

C-1i **Protect and monitor NRHP-eligible properties.** SCE shall design and implement a long-term plan which will be included in the HP/HPMP to protect NRHP-eligible sites from direct impacts of Project operation and maintenance and from indirect impacts, such as erosion, that result from the presence of the Project. The plan shall be developed in consultation with the Forest Service, USACE, and CPUC to design measures that will be effective against Project maintenance impacts and Project-related vehicular impacts. The plan shall also include protective measures for significant properties within the TRTP corridor that will experience operational and access impacts as a result of the proposed Project. The proposed measures may include restrictive fencing or gates, permanent access and spur road closures, signage, stabilization of erosion, site capping, site patrols, interpretive/educational programs, and/or other measures that will be effective for protecting cultural resources. The plan shall be property specific and shall include provisions for monitoring and reporting its effectiveness and for addressing inadequacies or failures that result in damage to significant properties. The plan shall be

submitted to the Forest Service, USACE, and CPUC for review and approval ~~at least 30 days prior to Project operation~~one year after execution of the PA as stated in the PA.

Monitoring of selected sites shall be conducted annually by a professional archaeologist for a period of ~~five~~three years following completion of Project construction. Monitoring shall include inspection of all site loci and defined surface features, documented by photographs from fixed photo-monitoring stations and written observations. A monitoring report shall be submitted to the Forest Service, USACE, and CPUC within one month following the annual resource monitoring. The report shall indicate any properties that have been impacted by erosion or vehicle or maintenance impacts. For properties that have been impacted, SCE shall provide recommendations for mitigating impacts and for improving protective measures. After the ~~fifth~~third year of resource monitoring, the Forest Service, USACE, or CPUC, as appropriate, will evaluate the effectiveness of the protective measures and the monitoring program. Based on that evaluation, the Forest Service, USACE, or CPUC may require that SCE revise or refine the protective measures, or alter the monitoring protocol or schedule. If the CPUC, USACE, and Forest Service (for NFS lands) do not authorize alteration of the monitoring protocol or schedule, those shall remain in effect for the duration of Project operation.

If the annual monitoring program identifies adverse effects to NRHP-eligible properties from operation or long-term presence of the Project, or if, at any time, SCE, Forest Service, USACE, or CPUC become aware of such adverse effects, SCE shall notify the Forest Service, USACE, and CPUC immediately and implement mitigation for adverse effects, as directed by the agencies. At the discretion of the Forest Service, USACE, and CPUC, such mitigation may include, but not be limited to modification of protective measures, refinement of monitoring protocols, data-recovery investigations, or payment of compensatory damages in the form of non-destructive cultural resources studies or protection.

Environmental Effects of Mitigation Measure C-1c

While Mitigation Measure C-1c is recommended to reduce impacts to ESAs, this measure may adversely affect other issue areas. The relocation of transmission lines, ancillary facilities, or temporary facilities or work areas to avoid or reduce damage to cultural resource values would potentially disturb sensitive biological resources that may be located in the vicinity of the rerouted area. Such potential impacts are similar to the effects of other Project activities, and would require the implementation of mitigation measures presented in Section 3.4 (Biological Resources).

CEQA Significance Conclusion

In many cases, direct impacts may be avoided through minor design modifications and Project effects would be reduced to a less-than-significant level (Class II) by the avoidance and protection measures listed in Mitigation Measures C-1a through C-1h, above; this is the preferred treatment for all cultural resources. Once final design is completed and the APE has been defined fully, additional surveys and evaluations may be necessary, as discussed in Mitigation Measure C-1b (Inventory cultural resources in the APE). Using best available data, known cultural resources should be avoided wherever possible through Project redesign and engineering modifications as described in Mitigation Measure C-1c (Avoid and protect significant resources). If cultural resources are identified through additional surveys or construction activities, then Mitigation Measures C-1e (Develop and implement Historic Properties Treatment Plan), C-1f (Conduct data recovery excavation or other actions to reduce adverse effects), C-1g (Conduct cultural resources monitoring), and C-1h (Train construction personnel to identify cultural resources) as detailed above, shall be implemented by SCE to ensure discovery, evaluation, and treatment

of unknown buried prehistoric and historical archaeological sites. Mitigation Measure C-1i would also serve to minimize indirect Project impacts.

Implementation of these measures would reduce impacts to less-than-significant levels from a CEQA standpoint. However, it is important to note that if direct impacts to NRHP properties eligible under Criterion d (significant data potential) are unavoidable, mitigation through data recovery would reduce impacts, but, under the NHPA regulations (federal), effects would still be considered adverse ~~(Class I)~~. Likewise, ~~if~~for properties eligible for the NRHP under Criteria a, b, or c ~~data recovery could~~, application of mitigation measures may not reduce impacts to a less-than-significant level, ~~then~~and effects still would be considered adverse ~~(Class I)~~.

Substantial adverse change in a resource included in a local register (Criterion CR2)

Background research and local policy screening revealed that no properties listed on local registers of historical resources will be affected by the proposed Project. As a result, there is no impact under Criterion CR2.

Expose and/or damage to Native American human remains (Criterion CR3)

Impact C-2: Native American human remains could be uncovered, exposed, and/or damaged during Construction.

Native American human remains or sacred features, in the form of primary inhumations, cremations, ceremonial bundles, or mourning ceremony features, could be inadvertently uncovered, exposed, and/or otherwise damaged during construction.

Mitigation Measure for Impact C-2

C-2 **Treatment of human remains discovered during construction.** APM CR-6 addresses the inadvertent discovery of human remains. If human remains are discovered during construction, all work will be diverted from the area of the discovery and the CPUC, USACE, and Forest Service authorized officer will be informed immediately. SCE shall follow all State and federal laws, statutes, and regulations that govern the treatment of human remains. As requested, SCE shall assist and support the CPUC, USACE, and Forest Service ~~with~~to comply with NAGPRA. SCE shall comply with all relevant Public Resource Codes and Health and Safety Codes regarding the ~~preparation~~discovery and handling of ~~a NAGPRA Action Plan and all required government to government consultations~~human remains, shall support consultation with Native Americans and appropriate agencies and commissions~~. SCE~~, and shall comply with and implement ~~all required~~ actions and studies ~~that result from such consultations,~~ as directed by the CPUC, USACE, and/or Forest Service.

CEQA Significance Conclusion

~~Exposure of unanticipated Native American human remains or sacred features during construction would be a significant and unavoidable impact (Class I) to the remains and an adverse effect under the regulations in the NHPA.~~ Implementation of Mitigation Measure C-2 ~~would reduce the severity of impacts to the extent feasible but~~ would ~~not~~ reduce impacts to a level of less than significant (Class II).

3.5.6.2 Cumulative Effects Analysis

Geographic Extent

For cultural resources, the geographic extent of cumulative impacts encompasses a relatively broad area because the significance or importance of any individual resource can only be judged in terms of its regional context and relationship to other resources. Thus, the significance of impacts on any given resource or group of resources must be examined in light of the integrity of the regional resource base. Because the number of cultural resources is finite, limited, and non-renewable, any assessment of cumulative impacts must take into consideration the impacts of the proposed Project on resources within the Area of Potential Effects; the extent to which those impacts degrade the integrity of the regional resource base; and impacts other projects may have on the regional resource base. If these effects, taken together, result in a collective degradation of the resources base, then those impacts are considered cumulatively considerable.

For the TRTP, the regional resource base is defined geographically, ethnographically, and with reference to the specific relevant administrative and management units. The geographic scope of the cumulative impact analysis takes in a broad region encompassing the entire western Antelope Valley, western San Gabriel Valley, and the intervening San Gabriel Mountains. The analysis also takes into consideration the cultural geography of the Serrano and Gabrieliño people who occupied the region prehistorically, considering the integrity of the entire suite of resources that make up the cultural patrimony of these groups. Finally, the cumulative impact analysis takes into account the resource base under the direct management and care of the ANF.

Existing Cumulative Conditions

Sections 3.5.2.2 through 3.5.2.7 describe the inventory of cultural resources within the APE of the proposed Project and alternatives. Between 135 and ~~151~~ 149 cultural resources are known to exist within the various proposed and alternative Project alignments, as the APE is currently defined. The classes of resources found within the TRTP APE largely reflect the types of sites found within the broader geographic, cultural, and administrative region considered for the cumulative analysis.

The condition of these resources varies depending on the relative effects of numerous natural and cultural agents which can diminish the integrity of any resource or group of resources. The most apparent impacts on cultural resources in the TRTP region are the result of human activities, including the following:

- Settlement, urbanization, and continuing population growth;
- Recreation, particularly increasing recreational uses in the ANF;
- Ranching, agriculture, and silviculture; and
- Development of roads, transmission lines, and other infrastructure.

The principal natural factors affecting the integrity of the resources are erosion, sedimentation, and soil deflation. The effects of natural impact agents can be exacerbated by human interventions which may increase their influence. For example, road construction can destabilize slopes and increase erosion of archaeological sites; desirable recreational sites are frequently coincident with the locations of cultural resources; and certain agricultural practices can increase erosion or create other damage to cultural resources.

Some resources have been seriously degraded by these natural and cultural activities. Virtually every cultural resource in the area of analysis has been affected to some extent by one or a combination of these

factors. In some cases, effects have been sufficient to damage or destroy the most important qualities of the resource.

Reasonably Foreseeable Future Projects and Changes

Trends that have led to degradation of the regional cultural resource base, and are expected to continue in the future, include continuing population growth in the Antelope Valley and the concomitant demand for new housing and infrastructure; continuing and increasing recreational use of the Forest landscape; continued ranching and agricultural activities; continuing urban development in the Los Angeles Basin; on-going transportation development and improvement; and the development of wind, solar, and other resources and the infrastructure to connect such resources with their points of consumption.

Major projects that may contribute in the foreseeable future to cumulative impacts on cultural resources include planned wind and solar power generation facilities such as the PdV/Manzana, Alta, and Pine Tree projects and their related transmission lines that will tie into the existing electrical grid system. Several other similar projects are also in the early planning stages. Development of transportation infrastructure such as the California High Speed Rail and Metro Gold Line Extension also has the potential to create direct, indirect, and cumulative impacts on the regional cultural resource base. As described in Section 2.9 (Cumulative Projects), dozens of smaller energy, housing, and recreation projects planned in jurisdictions throughout the region also have the potential to impact cultural resources. Both the list and projection methods of identifying foreseeable projects are appropriate for defining cumulative impacts on cultural resources.

Cumulative Impact Analysis

The significance of the TRTP's cumulative impacts on cultural resources is unknown because the magnitude of the Project's impacts on cultural resources cannot be determined until more information is available. Adverse effects to individual sites cannot be precisely identified until the final transmission structure locations are defined, specific structure sites are determined, detailed engineering plans for all Project roads and facilities are completed, the precise relationship of these Project elements to known sites is determined, and the final NRHP eligibility of cultural resources has been evaluated. If direct impacts to significant sites cannot be avoided, then a significant impact may occur. The magnitude of the Project's impacts on cultural resources, and thus its cumulative effect in combination with similar impacts from other projects, would depend on the number of sites affected adversely and the nature and extent of individual effects.

Based on the current analysis, as many as ~~55~~ 79 prehistoric and historical sites may be affected adversely. Most of these sites are located along potential Project access roads; ~~14~~ 39 are at known transmission structure locations, ~~ten~~ three are at wire setup sites, and ~~three~~ seven lie in helipad staging areas~~are at substations~~. Only one of these sites, CA-LAN-2343/H, has been formally evaluated and determined eligible ~~Only one site, CA LAN 3795, located along an access road, has None of these sites have been evaluated and found eligible~~ for the NRHP. ~~; the remaining sites have not been evaluated.~~ If the Project can be redesigned so that most of these sites are avoided and few sites are impacted significantly, if the extent of impacts is minor relative to the nature and extent of the individual site, if the types of sites impacted by the Project are common throughout the region, and if those impacts can be mitigated to less than significant through application of the Project APMs and other mitigation measures, then the combination of those impacts with similar impacts of other projects would not be cumulatively considerable.

If the Project cannot be redesigned so that most of these sites are avoided, and the affected sites prove after evaluation to be historic properties eligible for the NRHP, if the impacts are extensive, and/or if the types of sites impacted by the Project are unique, unusual, or uncommon in the region, then the combination of those impacts with similar impacts of other projects would be cumulatively considerable. The overall loss of cultural resources and cumulative degradation of the regional resource base would not be mitigated to less than significant by application of the Project APMs and other mitigation measures. As a result, cumulative impacts would be Class I, significant and unavoidable.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

For Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places), preparation of regional cultural resources overviews and research designs, synthetic analysis and interpretation of cultural resources in regional perspective, and expanded public interpretation of resources might lessen the TRTP's contribution to cumulative degradation of the regional resource base. For Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction), project-level impacts would be less than significant with implementation of Mitigation Measure C-2 (Treatment of human remains discovered during construction). Similar measures would be required for any past, present or reasonably foreseeable projects; therefore, this impact would not be cumulatively considerable. ~~there is no feasible additional mitigation to reduce its contribution to cumulative effects.~~

3.5.7 Alternative 3: West Lancaster Alternative

The direct and indirect effects on cultural resources of construction activities associated with Alternative 3, as well as subsequent mitigation measures, are identical to those presented for Alternative 2 because they follow the same route and use the same construction methods. No additional cultural resources were identified along the West Lancaster re-route, and thus the affected environment is identical to Alternative 2.

3.5.7.1 Direct and Indirect Effects Analysis

Adverse effect on historic properties (Criterion CR1)

Impacts associated with Criterion CR1 for Alternative 3 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Construction activities and methods would be identical to those of Alternative 2 and there would be no substantial increase in the potential for Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places) to occur. Implementation of Mitigation Measures C-1a through C-1i would reduce impacts to less-than-significant levels (Class II). Similarly, it is important to note that if direct impacts to NRHP properties eligible under Criterion d (significant data potential) are unavoidable, mitigation through data recovery would reduce impacts, but, under the NHPA regulations, effects would still be considered adverse. Likewise, ~~if~~for properties eligible for the NRHP under Criteria a, b, or c ~~data recovery could~~, application of mitigation measures may not reduce impacts to a less-than-significant level, ~~then~~and effects still would be considered adverse.

Substantial adverse change in a resource included in a local register (Criterion CR2)

Impacts associated with Criterion CR2 for Alternative 3 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Background research and local policy screening revealed

that no properties listed on local registers of historical resources will be affected. As a result, there is no impact under Criterion CR2.

Expose and/or damage to Native American human remains (Criterion CR3)

Impacts associated with Criterion CR3 for Alternative 3 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Construction activities and methods would be identical to those of Alternative 2 and there would be no substantial increase in the potential for Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction) to occur. Implementation of Mitigation Measure C-2 ~~would reduce the severity of impacts to the extent feasible but~~ would ~~not~~ reduce impacts to a level of less than significant (Class II).

3.5.7.2 Cumulative Effects Analysis

Geographic Extent

The geographic extent of cumulative effects for Alternative 3 would be the same as for Alternative 2, as discussed in Section 3.5.6.2.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 3 are the same as for Alternative 2, as discussed in Section 3.5.6.2.

Reasonably Foreseeable Future Projects and Changes

For Alternative 3, trends that have led to degradation of the regional cultural resource base, and are expected to continue in the future, as well as reasonably foreseeable future projects, are identical to those discussed for Alternative 2 (see Section 3.5.6.2).

Cumulative Impact Analysis

As for Alternative 2, the significance of cumulative impacts for Alternative 3 is unknown because the magnitude of the Project's impacts on cultural resources cannot be determined until more information is available (see Section 3.5.6.2). If more than a few sites are impacted significantly, if the impacts are extensive, and/or if the types of sites impacted by the Project are unique, unusual, or uncommon in the region, then the combination of those impacts with similar impacts of other projects would be cumulatively considerable. The overall loss of cultural resources and cumulative degradation of the regional resource base would not be mitigated to less than significant by application of the Project APMs and other mitigation measures. As a result, cumulative impacts would be Class I, significant and unavoidable.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

For Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places), preparation of regional cultural resources overviews and research designs, synthetic analysis and interpretation of cultural resources in regional perspective, and expanded public interpretation of resources might lessen the TRTP's contribution to cumulative degradation of the regional resource base. For Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction), project-level impacts would be less than significant with implementation of Mitigation Measure C-2 (Treatment of human remains discovered during construction).

Similar measures would be required for any past, present or reasonably foreseeable projects; therefore, this impact would not be cumulatively considerable. ~~there is no feasible additional mitigation to reduce its contribution to cumulative effects.~~

3.5.8 Alternative 4: Chino Hills Route Alternatives

The APE for Alternative 4 includes ~~139~~143 cultural resources. Of these, ~~25~~ 14 are isolated artifacts or other resources that have been evaluated and ~~judged~~determined ineligible for the National Register. ~~These~~ ~~25~~14 sites are not considered historic properties, and thus any effects on them are not considered significant impacts. ~~No further management consideration is warranted for these sites.~~

The remaining ~~114~~ 129 resources in the APE of Alternative 4 either have been evaluated and ~~judged~~determined significant historic properties, or have not been evaluated. Of these sites, ~~59~~ 83 may be affected by structure replacement, access and spur roads, or other elements of the Project. ~~Fifty-five~~Seventy-nine potentially affected sites are the same as those described for Alternative 2; additional details on these sites are presented in Section 3.5.6 above. Four additional potentially affected sites are located along or adjacent to the proposed all-weather access road routes to the new switching station required under Alternative 4 (Table 3.5-9). Two of these sites ~~are~~ contain both prehistoric and historical components ~~sites~~ while two date from the historical era; ~~none have~~one has been evaluated ~~for significance or eligibility~~eligible to the NRHP. Thus, the direct and indirect effects on cultural resources of construction activities associated with Alternative 4, as well as subsequent mitigation measures, are comparable to those presented for Alternative 2. Specific impacts would be slightly different because four additional potentially affected sites are located along the all-weather access road routes to the new switching station.

Cumulative impacts of Alternative 4 also are comparable to Alternative 2 because the existing cumulative conditions for Alternative 4 and trends that have led to degradation of the regional cultural resources base are similar to Alternative 2.

Table 3.5-9. Additional Potentially Affected Cultural Resources, Alternative 4

Site Designation	Period	National Register Eligibility	Impact Criterion			Potential Impact				
			CR1	CR2	CR3	Substation	Existing Access Road	Wire Setup Site	Tower Site	Staging Area
~~CA-~~SBR-~~6021~~3690/H	P/H	Not Evaluated	X				X			
SBR-4033H	H	Not Evaluated	X				X			
SBR-~~5097H~~5097/H	P/H	~~Not Evaluated~~Eligible	X				X			
SBR-~~5283~~7010H	P	Not Evaluated	X				X			

Key: P/H = Prehistoric/Historic; H = Historic; P = Prehistoric

3.5.8.1 Direct and Indirect Effects Analysis

Adverse effect on historic properties (Criterion CR1)

Impacts associated with Criterion CR1 for Alternative 4 would be comparable to impacts associated with this criterion for Alternative 2. Construction activities and methods would be identical to those of Alternative 2 (see Section 3.5.6.1). Specific impacts would be slightly different because four additional

sites are located along the proposed all-weather access road routes to the new switching station. In general, however, there would be no substantial increase in the potential for Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places) to occur. Implementation of Mitigation Measures C-1a through C-1i would reduce impacts to less-than-significant levels (Class II). Similarly, it is important to note that if direct impacts to NRHP properties eligible under Criterion d (significant data potential) are unavoidable, mitigation through data recovery would reduce impacts, but, under the NHPA regulations, effects would still be considered adverse. Likewise, ~~if~~for properties eligible for the NRHP under Criteria a, b, or c ~~data recovery could~~, application of mitigation measures may not reduce impacts to a less-than-significant level, ~~then~~and effects still would be considered adverse.

Substantial adverse change in a resource included in a local register (Criterion CR2)

Impacts associated with Criterion CR2 for Alternative 4 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Background research and local policy screening revealed that no properties listed on local registers of historical resources will be affected. As a result, there is no impact under Criterion CR2.

Expose and/or damage to Native American human remains (Criterion CR3)

Impacts associated with Criterion CR3 for Alternative 4 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Construction activities and methods would be identical to those of Alternative 2. Specific impacts would be slightly different because four additional sites are located along the proposed all-weather access road routes to the new switching station. In general, however, there would be no substantial increase in the potential for Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction) to occur. Implementation of Mitigation Measure C-2 ~~would reduce the severity of impacts to the extent feasible but~~ would ~~not~~ reduce impacts to a level of less than significant (Class II).

3.5.8.2 Cumulative Effects Analysis

Geographic Extent

The geographic extent of cumulative effects for Alternative 4 would be the same as for Alternative 2, as discussed in Section 3.5.6.2.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 4 are similar to Alternative 2. However, cultural resources along the new ROW would not have suffered from disturbance associated with construction, operation, and maintenance of the existing lines; thus existing cumulative impacts are not as great as along the existing ROW.

Reasonably Foreseeable Future Projects and Changes

For Alternative 4, trends that have led to degradation of the regional cultural resource base, and are expected to continue in the future, as well as reasonably foreseeable future projects, are identical to those discussed for Alternative 2 (see Section 3.5.6.2).

Cumulative Impact Analysis

As for Alternative 2, the significance of cumulative impacts for Alternative 4 is unknown because the magnitude of the Project's impacts on cultural resources cannot be determined until more information is available (see Section 3.5.6.2). If more than a few sites are impacted significantly, if the impacts are extensive, and/or if the types of sites impacted by the Project are unique, unusual, or uncommon in the region, then the combination of those impacts with similar impacts of other projects would be cumulatively considerable. The overall loss of cultural resources and cumulative degradation of the regional resource base would not be mitigated to less than significant by application of the Project APMs and other mitigation measures. As a result, cumulative impacts would be Class I, significant and unavoidable. However, the cumulative impacts of Alternative 4 are not expected to be greater than for Alternative 2 because the current Project design will not impact cultural sites along the new ROW required for the Chino Hills reroutes, although four sites along the proposed all-weather access road route to the switching station may be affected.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

For Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places), preparation of regional cultural resources overviews and research designs, synthetic analysis and interpretation of cultural resources in regional perspective, and expanded public interpretation of resources might lessen the TRTP's contribution to cumulative degradation of the regional resource base. For Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction), project-level impacts would be less than significant with implementation of Mitigation Measure C-2 (Treatment of human remains discovered during construction). Similar measures would be required for any past, present or reasonably foreseeable projects; therefore, this impact would not be cumulatively considerable. ~~there is no feasible additional mitigation to reduce its contribution to cumulative effects.~~

3.5.9 Alternative 5: Partial Underground Alternative

The direct and indirect effects on cultural resources of construction activities associated with Alternative 5, as well as subsequent mitigation measures, are similar to those presented for Alternative 2. Specific impacts may be slightly different because of the construction methods unique to Alternative 5, including portals, air/service shafts, bore holes, and other features related to underground construction. The direct and indirect impacts of these unique construction methods would be comparable, though they may be greater, than those presented for Alternative 2.

3.5.9.1 Direct and Indirect Effects Analysis

Adverse effect on historic properties (Criterion CR1)

Depending on the number of bore holes, vents, portals, shafts, access roads, and other facilities associated specifically with underground construction, the magnitude of impacts along Segment 8A associated with Criterion CR1 could be greater than impacts associated with this criterion for Alternative 2. These specific underground construction features may disturb a greater area than their comparable above ground construction methods, thus resulting in greater physical impacts to cultural resources that cannot be avoided. Construction activities and methods along other Project segments would be identical to those of Alternative 2 (see Section 3.5.6.1) and there would be no substantial increase in the potential for Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places) to occur in those segments.

Implementation of Mitigation Measures C-1a through C-1i would reduce impacts to less-than-significant levels (Class II). Similarly, it is important to note that if direct impacts to NRHP properties eligible under Criterion d (significant data potential) are unavoidable, mitigation through data recovery would reduce impacts, but, under the NHPA regulations, effects would still be considered adverse. Likewise, ~~if~~for properties eligible for the NRHP under Criteria a, b, or c~~ data recovery could~~, application of mitigation measures may not reduce impacts to a less-than-significant level, ~~then~~and effects still would be considered adverse.

Substantial adverse change in a resource included in a local register (Criterion CR2)

Impacts associated with Criterion CR2 for Alternative 5 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Background research and local policy screening revealed that no properties listed on local registers of historical resources will be affected. As a result, there is no impact under Criterion CR2.

Expose and/or damage to Native American human remains (Criterion CR3)

Although the likelihood of encountering human remains along Segment 8A is low, the potential exists and increased ground disturbance associated with specific underground construction techniques could result in greater physical impacts to cultural resources that cannot be avoided. Construction activities and methods along other Project segments would be identical to those of Alternative 2 (see Section 3.5.6.1) and there would be no substantial increase in the potential for Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction) to occur in those segments. Implementation of Mitigation Measure C-2 ~~would reduce the severity of impacts to the extent feasible but~~ would ~~not~~ reduce impacts to a level of less than significant (Class II).

3.5.9.2 Cumulative Effects Analysis

Geographic Extent

The geographic extent of cumulative effects for Alternative 5 would be the same as for Alternative 2, as discussed in Section 3.5.6.2.

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 5 are identical to Alternative 2, as discussed in Section 3.5.6.2.

Reasonably Foreseeable Future Projects and Changes

For Alternative 5, trends that have led to degradation of the regional cultural resource base, and are expected to continue in the future, as well as reasonably foreseeable future projects, are identical to those discussed for Alternative 2 (see Section 3.5.6.2).

Cumulative Impact Analysis

As for Alternative 2, the significance of cumulative impacts for Alternative 5 is unknown because the magnitude of the Project's impacts on cultural resources cannot be determined until more information is available (see Section 3.5.6.2). If more than a few sites are impacted significantly, if the impacts are extensive, and/or if the types of sites impacted by the Project are unique, unusual, or uncommon in the region, then the combination of those impacts with similar impacts of other projects would be

cumulatively considerable. The overall loss of cultural resources and cumulative degradation of the regional resource base would not be mitigated to less than significant by application of the Project APMs and other mitigation measures. As a result, cumulative impacts would be Class I, significant and unavoidable.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

For Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places), preparation of regional cultural resources overviews and research designs, synthetic analysis and interpretation of cultural resources in regional perspective, and expanded public interpretation of resources might lessen the TRTP's contribution to cumulative degradation of the regional resource base. For Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction), project-level impacts would be less than significant with implementation of Mitigation Measure C-2 (Treatment of human remains discovered during construction). Similar measures would be required for any past, present or reasonably foreseeable projects; therefore, this impact would not be cumulatively considerable. ~~there is no feasible additional mitigation to reduce its contribution to cumulative effects.~~

3.5.10 Alternative 6: Maximum Helicopter Construction in the ANF Alternative

The direct and indirect effects on cultural resources of construction activities associated with Alternative 6, as well as subsequent mitigation measures, are similar to those presented for Alternative 2. Specific impacts would be slightly different because cultural resources at proposed helicopter staging areas may be affected, while impacts associated with construction in Segments 6 and 11 using standard techniques may be reduced. Impacts along all other segments would remain the same. Thus, overall direct and indirect impacts of this alternative are expected to be comparable to Alternative 2.

The APE for Alternative 6 includes ~~142~~ 140 cultural resources. Of these, ~~27~~ 13 are isolated artifacts or other resources that have been evaluated and ~~judged~~determined ineligible for the National Register. These ~~27~~ 13 sites are not considered historic properties, and thus any effects on them are not considered significant impacts. No further management consideration is warranted for these sites.

The remaining ~~115~~ 127 resources in the APE of Alternative 6 either have been evaluated and ~~judged~~determined significant historic properties, or have not been evaluated. Of these sites, ~~59~~ 83 may be affected by transmission structure replacement, access and spur roads, or other elements of the Project.~~, including six unevaluated sites in the five alternative helicopter staging areas to be used if Alternative 6 is adopted.~~ These potentially affected sites include the ~~55~~ 79 sites that are listed in Table 3.5-8~~2~~ for Alternative 2 and four additional sites that lie exclusively within helicopter staging areas to be used if Alternative 6 is adopted. Table 3.5-10 shows the National Register status (eligible or unevaluated), Project actions that may affect them (e.g., structure construction, use of existing road), and potential impact criteria (CR1 through CR3) for these four resources.

Table 3.5-10. Additional Potentially Affected Cultural Resources, Alternative 6

Site Designation	Period	National Register Eligibility	Impact Criterion			Potential Impact				
			CR1	CR2	CR3	Substation	Access Road	Wire Setup Site	Tower Site	Staging Area
AE-TRTP-1	P	Not Evaluated	X							X
AE-TRTP-~~2~~HP10	~~P~~H	Not Evaluated	X							X
~~AE-TRTP-3~~	~~P~~	~~Not Evaluated~~	~~X~~							~~X~~
05015100205	P	Not Evaluated	X							X
05015500229	P/H	Not Evaluated	X							X

Key: P/H = Prehistoric/Historic; H = Historic; P = Prehistoric

3.5.10.1 Direct and Indirect Effects Analysis

Adverse effect on historic properties (Criterion CR1)

Impacts associated with Criterion CR1 for Alternative 6 would be similar to impacts associated with this criterion for Alternative 2. Specific impacts would be slightly different because cultural resources at proposed helicopter staging areas may be affected, while impacts associated with construction in Segments 6 and 11 using standard techniques may be reduced. Impacts along all other segments would remain the same (see Section 3.5.6.1). In general, there would be no substantial increase in the potential for Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places) to occur. Implementation of Mitigation Measures C-1a through C-1i would reduce impacts to less-than-significant levels (Class II). Similarly, it is important to note that if direct impacts to NRHP properties eligible under Criterion d (significant data potential) are unavoidable, mitigation through data recovery would reduce impacts, but, under the NHPA regulations, effects would still be considered adverse. Likewise, ~~if~~for properties eligible for the NRHP under Criteria a, b, or c~~ data recovery could~~, application of mitigation measures may not reduce impacts to a less-than-significant level, ~~then~~and effects still would be considered adverse.

Substantial adverse change in a resource included in a local register (Criterion CR2)

Impacts associated with Criterion CR2 for Alternative 6 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Background research and local policy screening revealed that no properties listed on local registers of historical resources will be affected.~~-~~ As a result, there is no impact under Criterion CR2.

Expose and/or damage to Native American human remains (Criterion CR3)

Impacts associated with Criterion CR3 for Alternative 6 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Specific impacts would be slightly different because cultural resources at proposed helicopter staging areas may be affected, while impacts associated with construction in Segments 6 and 11 using standard techniques may be reduced. Impacts along all other segments would remain the same. In general, there would be no substantial increase in the potential for Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction) to occur. Implementation of Mitigation Measure C-2 ~~would reduce the severity of impacts to the extent feasible but~~ would ~~not~~ reduce impacts to a level of less than significant (Class II).

3.5.10.2 Cumulative Effects Analysis

Geographic Extent

The geographic extent of cumulative effects for Alternative 6 would be the same as for Alternative 2 (see Section 3.5.6.2).

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 6 are similar to Alternative 2. In general, cultural resources at proposed helicopter staging areas may not have suffered from disturbance associated with construction, operation, and maintenance of the existing lines; however, most proposed staging areas have been used previously, and thus sites at these locations have still suffered some prior disturbance. Thus existing cumulative impacts are comparable.

Reasonably Foreseeable Future Projects and Changes

For Alternative 6, trends that have led to degradation of the regional cultural resource base, and are expected to continue in the future, as well as reasonably foreseeable future projects, are identical to those discussed for Alternative 2 (see Section 3.5.6.2).

Cumulative Impact Analysis

As for Alternative 2, the significance of cumulative impacts for Alternative 6 is unknown because the magnitude of the Project's impacts on cultural resources cannot be determined until more information is available. However, the cumulative impacts of Alternative 6 may be greater than for Alternative 2 if effects on significant resources at the proposed helicopter staging areas are not offset by the reduced effects of helicopter construction. If more than a few sites are impacted significantly, if the impacts are extensive, and/or if the types of sites impacted by the Project are unique, unusual, or uncommon in the region, then the combination of those impacts with similar impacts of other projects would be cumulatively considerable. The overall loss of cultural resources and cumulative degradation of the regional resource base would not be mitigated to less than significant by application of the Project APMs and other mitigation measures. As a result, cumulative impacts would be Class I, significant and unavoidable.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

For Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places), preparation of regional cultural resources overviews and research designs, synthetic analysis and interpretation of cultural resources in regional perspective, and expanded public interpretation of resources might lessen the TRTP's contribution to cumulative degradation of the regional resource base. For Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction), project-level impacts would be less than significant with implementation of Mitigation Measure C-2 (Treatment of human remains discovered during construction). Similar measures would be required for any past, present or reasonably foreseeable projects; therefore, this impact would not be cumulatively considerable. ~~there is no feasible additional mitigation to reduce its contribution to cumulative effects.~~

3.5.11 Alternative 7: 66-kV Subtransmission Alternative

The direct and indirect effects on cultural resources of construction activities associated with Alternative 7, as well as subsequent mitigation measures, are similar to those presented for Alternative 2. Specific impacts may be greater because of the greater archaeological and historical sensitivity of the reroute and underground alignments and higher potential for buried remains, including human remains. Impacts along all other segments would remain the same. Thus, overall direct and indirect impacts of this alternative are expected to be greater than Alternative 2.

3.5.11.1 Direct and Indirect Effects Analysis

Adverse effect on historic properties (Criterion CR1)

Impacts associated with Criterion CR1 for Alternative 7 would be similar to impacts associated with this criterion for Alternative 2. Specific impacts may be greater because there are ~~16~~11 identified eligible or potentially eligible cultural resources along the three elements of Alternative 7, ~~four~~three of which are already considered historic properties and ~~12~~8 of which have not been evaluated (see Table 3.5-~~6~~11). Some of these resources may be affected by construction of this alternative~~.~~; however, specific impacts for Alternative 7 are currently unknown. Additionally, there is a high potential for buried archaeological ~~remains~~sites in the Whittier Narrows vicinity. Thus, there is a substantial increase in the potential for Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places) to occur.

Table 3.5-11. Additional Potentially Affected Cultural Resources, Alternative 7

Site Designation	Period	National Register Eligibility	Impact Criterion			Potential Impacts				
			CR1	CR2	CR3	Substation	Access Road	Wire Setup Site	Tower Site	Staging Area
Whittier Narrows 66-kV Overhead Element (Includes Option 1 and 2)										
Battista Ciocca Dairy	P	Not Evaluated	X			Impacts for Alternative 7 are unknown				
Battista Ciocca Groves and Structures	H	Not Evaluated	X							
Basye Adobe Site	H	Eligible	X							
Briano Winery	H	Not Evaluated	X							
Early Oil Discoveries	H	Not Evaluated	X							
Estratta Farm	H	Not Evaluated	X							
Farmer Home	H	Not Evaluated	X							
La Merced Adobe	H	Not Evaluated	X							
Mission Vieja Monument	H	Eligible	X							
Nutt Farm	H	Not Evaluated	X							
Duck Farm 66-kV Underground Element										
Louise Ward Residence*	H	Eligible	X			Impacts for Alternative 7 are unknown				

*It is unlikely that the significant architectural features of this resource will be affected by the 66-kV Underground Element.

Impacts along all other segments would remain the same as Alternative 2 (see Section 3.5.6.1). Implementation of Mitigation Measures C-1a through C-1i would reduce impacts to less-than-significant levels (Class II). It is important to note that if direct impacts to NRHP properties eligible under Criterion d (significant data potential) are unavoidable, mitigation through data recovery would reduce impacts, but, under the NHPA regulations, effects would still be considered adverse. Likewise, ~~if~~for properties eligible for the NRHP under Criteria a, b, or c~~ data recovery could~~, application of mitigation measures may not reduce impacts to a less-than-significant level, ~~then~~and effects still would be considered adverse.

Substantial adverse change in a resource included in a local register (Criterion CR2)

Impacts associated with Criterion CR2 for Alternative 7 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Background research and local policy screening revealed that no properties listed on local registers of historical resources will be affected. As a result, there is no impact under Criterion CR2.

Expose and/or damage to Native American human remains (Criterion CR3)

Impacts associated with Criterion CR3 for Alternative 7 would be the same as impacts associated with this criterion for Alternative 2 (see Section 3.5.6.1). Specific impacts may be greater because of the greater archaeological sensitivity and potential for buried archaeological ~~remains~~sites in the Whittier Narrows area, and the potential for burials associated with the Mission Vieja site, whose general location is known but whose specific location has not been pinpointed. Thus, there is a substantial increase in the potential for Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction) to occur. Impacts along all other segments would remain the same. Implementation of Mitigation Measure C-2 ~~would reduce the severity of impacts to the extent feasible but~~ would ~~not~~ reduce impacts to a level of less than significant (Class II).

3.5.11.2 Cumulative Effects Analysis

Geographic Extent

The geographic extent of cumulative effects for Alternative 7 would be the same as for Alternative 2 (see Section 3.5.6.2).

Existing Cumulative Conditions

The existing cumulative conditions for Alternative 7 are similar to Alternative 2. In general, cultural resources along proposed Alternative 7 re-routes and undergrounding have suffered past effects from floods, fires, industrial and residential development, flood control projects, and other historical activities. These cumulative impacts are comparable to those along other portions of Segments 7 and 8A in the Whittier Narrows area. Thus existing cumulative impacts are comparable to Alternative 2.

Reasonably Foreseeable Future Projects and Changes

For Alternative 7, trends that have led to degradation of the regional cultural resource base and are expected to continue in the future, as well as reasonably foreseeable future projects, are identical to those discussed for Alternative 2 (see Section 3.5.6.2).

Cumulative Impact Analysis

As for Alternative 2, the significance of cumulative impacts for Alternative 7 is unknown because the magnitude of the Project's impacts on cultural resources cannot be determined until more information is available. However, the cumulative impacts of Alternative 7 may be greater than for Alternative 2 because there are more resources recorded along the alternative elements, and a comparable number are not avoided by the proposed re-routes and undergrounding. If more than a few sites are impacted significantly, if the impacts are extensive, and/or if the types of sites impacted by the Project are unique, unusual, or uncommon in the region, then the combination of those impacts with similar impacts of other projects would be cumulatively considerable. The overall loss of cultural resources and cumulative degradation of the regional resource base would not be mitigated to less than significant by application of the Project APMs and other mitigation measures. As a result, cumulative impacts would be Class I, significant and unavoidable.

Mitigation to Reduce the Project's Contribution to Significant Cumulative Effects

For Impact C-1 (Construction may diminish the integrity of properties eligible for inclusion in the National Register of Historic Places), preparation of regional cultural resources overviews and research designs, synthetic analysis and interpretation of cultural resources in regional perspective, and expanded public interpretation of resources might lessen the TRTP's contribution to cumulative degradation of the regional resource base. For Impact C-2 (Native American human remains could be uncovered, exposed, and/or damaged during Construction), project-level impacts would be less than significant with implementation of Mitigation Measure C-2 (Treatment of human remains discovered during construction). Similar measures would be required for any past, present or reasonably foreseeable projects; therefore, this impact would not be cumulatively considerable. ~~there is no feasible additional mitigation to reduce its contribution to cumulative effects.~~

3.5.12 Impact Significance Summary

Table 3.5-12~~11~~ summarizes the direct and indirect environmental impacts of the proposed Project (Alternative 2) and the other alternatives related to cultural resources. The direct and indirect effects of the Project and alternatives have been fully described in Sections 3.5.6 through 3.5.11 above. Alternative 1 (No Project/No Action) impacts are fully described in Section 3.5.5; however, since no potential future project information is available an impact significance level for Alternative 1 is not included in the table below.

Table 3.5-12~~11~~. Summary of Impacts and Mitigation Measures – Cultural Resources

Impact	Impact Significance								Mitigation Measures
	Alt. 1+	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
C-1: Construction may diminish the integrity of properties eligible for the National Register of Historic Places.	N/A	Class II	Class II	Class II	Class II	Class II	Class II	Yes	C-1a: Develop and execute a Programmatic Agreement. C-1b: Inventory cultural resources in the Final APE. C-1c: Avoid and protect significant resources. C-1d: Evaluate the significance of cultural resources that cannot be avoided. C-1e: Develop and implement Historic Properties ~~Treatment~~/Historical Resources Management Plan. C-1f: Conduct data recovery excavation or other actions to reduce adverse effects. C-1g: Conduct cultural resources monitoring. C-1h: ~~Train construction personnel to identify cultural resources.~~Workers Environmental Awareness Program. C-1i: Protect and monitor NRHP-eligible properties.
C-2: Native American human remains could be uncovered, exposed, and/or damaged during Construction.	N/A	Class II	Class II	Class II	Class II	Class II	Class II	Yes	C-2: Treatment of human remains discovered during construction.

N/A = Not Available

* Indicates whether this impact is applicable to the portion of the Project on National Forest System lands.

+ Potential projects would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and subsequently introduce similar types of impacts.