1. Introduction

This Specialist Report presents an analysis of environmental impacts related to Geology, Soils, and Paleontology for Southern California Edison's (SCE's) proposed Tehachapi Renewable Transmission Project (TRTP), which is described below. This report has been prepared in support of an Environmental Impact Report and Environmental Impact Statement (EIR/EIS) being prepared jointly by the California Public Utilities Commission (CPUC) and the USDA Forest Service. This Specialist Report describes existing environmental conditions in the affected area, identifies and analyses environmental impacts for a range of Project alternatives, and recommends measures to reduce or avoid adverse impacts expected from Project construction and operations.

This Specialist Report has been organized to facilitate the incorporation of information and analysis contained herein into the Draft EIR/EIS. The report is organized into the following sections:

- **Section 1** presents an overview of the Project and the alternatives to the Project, as well as information on required CPUC and Forest Service approvals and issues identified during the scoping process for the EIR/EIS.
- **Section 2** provides a detailed description of existing environmental conditions at the time when the preparation of this report was initiated.
- **Section 3** provides an overview of regulations and other legal requirements applicable to the proposed Project, some of which may serve to avoid or reduce certain impacts of the Project.
- **Section 4** describes the approach to analysis of impacts, including methodologies and assumptions utilized.
- **Sections 5 through 11** present analyses of the impacts of the alternatives, including the No Project/Action Alternative (Alternative 1) and SCE's proposed Project (Alternative 2). These sections present analyses of the direct, indirect, and cumulative impacts of each alternative.
- **Section 12** provides a comparison of the impacts of the alternatives.
- **Section 13** lists the mitigation measures recommended to reduce or avoid the adverse impacts of the Project and alternatives, including a program for monitoring the implementation of these measures.
- **Section 14** lists reference materials used in the preparation of this Specialist Report

1.1 Project Purpose and Need

A project's statement of objectives (required by CEQA) and purpose of and need for action (required by NEPA) describe the underlying purpose of the project and the reasons for undertaking the project. 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 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 goals in an expedited manner (i.e., 20 percent renewable energy by year 2010 per California Senate Bill 107).
- Further 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 TRTP purpose, objectives, and need are described in greater detail in Section 1.2 of the EIR/EIS.

1.2 The Proposed Project/Action and Alternatives

This section provides a description of the No Project/Action Alternative, SCE's proposed Project, and the other alternatives to the proposed Project that the Lead Agencies determined accomplished the primary Project purpose and need, are feasible, and would avoid or lessen certain adverse effects associated with SCE's proposed Project.

1.2.1 Alternative 1: No Project/Action Alternative

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 Section 6, 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 (landowners) 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 Wind Development) 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. 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, 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 the same system reliability requirements.
- 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 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, 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.

1.2.2 Alternative 2: SCE's Proposed Project

SCE's proposed Project involves construction of new and upgraded transmission infrastructure along approximately 173 miles of new and existing 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. The major components of the 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 lines, 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 report 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 components, by segment, is presented in Table 1-1, below. 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.

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

Overall Project Construction
• Proposed construction duration of 59 months (estimated to begin in December 2009 and end in October 2014) 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 acres with a ±15% range of 1,370-1,854 acres, resulting in permanent land disturbance of approximately 349 acres with a ±15% range of 297-402 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 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 (Vincent – Whirlwind 220-kV No. 1 & No. 2)
• Construct new approximately 15.6-mile single-circuit Antelope – 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 feet tall)
  ▪ 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-mile single-circuit Antelope – Vincent No. 2 500-kV T/L • 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 miles) • Erect approximately 67 new single-circuit 500-kV LSTs (90 - 193 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)

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

- 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 existing structures are located on NFS lands)
- Most of the proposed infrastructure would be located within existing ROW; however, the ROW may need to be expanded by up to approximately 250 feet to the west along the approximately 16 miles north of Gould Substation 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 (68 on National Forest System [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. 32 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 tubular steel poles (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 helicopter staging areas (5 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 miles (±15% range of 51 to 69 miles) of roads, of which approximately 57 miles (±15% range of 49 to 66 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)

Table 1-1. Summary of Alternative 2 (SCE's Proposed Project) Components
▪ 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-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 acres for Antelope upgrade and approximately 0.2 acre for Vincent upgrade; Vincent expansion would disturb approximately 20 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.

1.2.3 Alternative 3: West Lancaster Alternative

This alternative would re-route the new 500-kV transmission line in Segment 4 along 115th Street West rather than 110th Street West. The West Lancaster Alternative would deviate from the proposed route 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 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.

1.2.4 Alternative 4: Chino Hills Route Alternatives

Route A

This alternative route would deviate from the proposed Project (Alternative2) beginning about two miles east of State Route 57 (approximately S8A MP 19.2), where the existing Walnut/Olinda-Mira Loma 220-kV double-circuit transmission line and the existing un-energized Mesa-Chino transmission line (both in the same corridor as that of Segment 8A) separate from one another. At that point, the new Vincent-Mira Loma 500-kV transmission line would turn southeast, remaining parallel and south of the existing Walnut/Olinda-Mira Loma 220-kV double-circuit transmission line 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). 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 spur roads would be required to access the structures constructed as part of this alternative.

At the junction of the existing Walnut/Olinda-Mira Loma 220-kV transmission lines and the existing Serrano-Mira Loma and Serrano-Rancho Vista 500-kV transmission lines, the new Vincent-Mira Loma 500-kV transmission line would terminate into a new 500-kV gas-insulated switching station. The existing 500-kV lines 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 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 – 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

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. 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. 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.

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, although upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220-kV transmission lines in Segment 8B (6.8 miles) would still occur. Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) would not be constructed (Segment 8A), and approximately 37 double-circuit 220-kV structures would be constructed (Segment 8B).

Route B

This alternative route would deviate from the proposed Project (Alternative 2) beginning about two miles east of State Route 57 (approximately S8A MP 19.2), where the existing Walnut/Olinda-Mira Loma 220-kV double-circuit transmission line and the existing un-energized Mesa-Chino transmission line (both in the same corridor as that of Segment 8A) separate from one another. At that point, the new Vincent-Mira Loma 500-kV transmission line would turn southeast, remaining parallel and north of the existing

Walnut/Olinda-Mira Loma 220-kV double-circuit transmission line 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 transmission line for approximately 4.9 miles, at which point the new Vincent-Mira Loma 500-kV transmission line 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 switching station located just south of the existing 500-kV lines. 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. New permanent spur roads would be required to access the structures constructed as part of this alternative.

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. 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.

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. 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. 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.

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, although upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220-kV transmission lines in Segment 8B (6.8 miles) would still occur. Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) would no longer be constructed (Segment 8A) and approximately 37 double-circuit 220-kV structures would be constructed (Segment 8B).

Route C

This alternative route would deviate from the proposed Project (Alternative 2) beginning about two miles east of State Route 57 (approximately S8A MP 19.2), where the existing Walnut/Olinda-Mira Loma 220-kV double-circuit transmission line and the existing un-energized Mesa-Chino T/L (both in the same corridor as that of Segment 8A) separate from one another. At that point, the new Vincent-Mira Loma 500-kV transmission line would turn southeast, and remain parallel and south of the existing Walnut/Olinda-Mira Loma 220-kV double-circuit transmission line 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. Approximately 19 double-circuit 500-kV LSTs would be required for this approximately 5.7-mile

re-route to the new switching station. 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.

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. 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).

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 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. For the gas-insulated switching station, the entire system would be enclosed in a sheet metal building, which would require an air conditioning system. 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. 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 500-kV lines 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). 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). In addition, approximately 17 LSTs (13 of which are within CHSP) of the existing single-circuit 500-kV T/Ls would be removed (approximately 2.5 miles).

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 (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. 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 mile 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 (5 to 7 within CHSP). In addition, approximately 12 existing 220-kV double-circuit LSTs within CHSP and 2 outside CHSP (14 total) would be removed (2.4 miles).

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, although upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220-kV transmission lines in Segment 8B (6.8 miles) would still occur. Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) would no longer be constructed (Segment 8A) and approximately 37 double-circuit 220-kV structures would be constructed (Segment 8B).

Rout 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. 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. 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.

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, although upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220-kV T/Ls in Segment 8B (6.8 miles) would still occur. Consequently, as with the original Route 4C, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) would no longer be constructed (Segment 8A) and approximately 37 double-circuit 220-kV structures would be constructed (Segment 8B).

Route D

This alternative route would deviate from the proposed Project (Alternative 2) beginning about two miles east of State Route 57 (approximately S8A MP 19.2), where the existing Walnut/Olinda-Mira Loma 220-kV double-circuit transmission line and the existing un-energized Mesa-Chino transmission line (both in the same corridor as that of Segment 8A) separate from one another. At that point, the new Vincent-Mira Loma 500-kV transmission line would turn southeast, and remain parallel and north of the existing Walnut/Olinda-Mira Loma 220-kV double-circuit transmission line 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. At this point, the new Vincent-Mira Loma 500-kV transmission line 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, 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 switching station located outside of CHSP, just south of the existing 500-kV lines. 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. 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. 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.

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.

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, although upgrades to the existing Chino-Mira Loma No. 1, 2, and 3 220-kV transmission lines in Segment 8B (6.8 miles) would still occur. Consequently, approximately 78 double-circuit 500-kV structures (18 LSTs and 60 TSPs) would no longer be constructed (Segment 8A) and approximately 37 double-circuit 220-kV structures would be constructed (Segment 8B).

1.2.5 Alternative 5: Partial Underground Alternative

This alternative would utilize underground construction through Chino Hills between approximately S8A MP 21.9 and 25.4 in place of the proposed overhead line construction, following generally the same route as the proposed Project (Alternative 2). Beginning just west of the dead-end of Eucalyptus Avenue (~S8A MP 21.9) the proposed double-circuit 500-kV T/L would transition from overhead to underground via a new transition station, which would require an area approximately 220 feet wide and 320 feet long (1.6 acres). The underground segment would continue underground generally following the existing ROW for approximately 3.5 miles through the developed area of Chino Hills to an area just west of Pipeline Avenue and State Highway 71 (~S8A MP 25.4), where a transition station would be placed to convert the double-circuit 500-kV T/L back from underground to overhead. The existing 220-kV T/L along Segment 8A would be left in place from approximately S8A MP 21.9 to 25.4.

Gas-insulated transmission line (GIL) technology would be used for the underground portions of this alternative. Tunnel boring would be utilized to create an 18-foot (external diameter) underground tunnel, with vertical access shafts on either end that 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). To remove heat from within the tunnel and to provide a source of oxygen in the tunnel for life support purposes, a ventilation system would be installed. It is anticipated that three approximately 10- to 20-foot diameter ventilation shafts would be distributed along

the underground tunnel. The aboveground features of the ventilation system 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.

1.2.6 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. Helicopter staging/support areas have been identified within the vicinity of Segments 6 and 11 to facilitate helicopter construction within the ANF. A total of 148 new 500-kV towers would be constructed by helicopter under this alternative, 92 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.

1.2.7 Alternative 7: 66-kV Subtransmission Alternative

This alternative is comprised of 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 (20-foot expanded ROW required); and (4) 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.

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. Beginning at the north side of Valley Boulevard (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 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.

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, requiring a 20-foot expansion

of the existing ROW, beginning at Durfee Avenue (S7 MP 12.0) through Legg Lake Park and the Whittier Narrows Recreation Area to the San Gabriel Junction (S7 MP 13.6). 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 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. 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.

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. 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, 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 replacing the existing idle 66-kV structures with new TSPs. 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 (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, approximately eight new LWSPs and ten bolt based TSPs at either side of the channel crossing (14 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-foot ROW at the San Gabriel River crossing (SCE, 2008h). These additional LWSPs would be installed to accommodate the new 66-kV subtransmission lines. While this 66-kV re-route would require approximately 14 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 66-kV LWSPs that would otherwise be required by the proposed Project (Alternative 2). 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.

1.3 CPUC and Forest Service Approvals Required

SCE filed an application with the CPUC for approval of a Certificate of Public Convenience and Necessity (CPCN) (Application A.07-06-031) on June 29, 2007. 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 transmission facilities across National Forest System (NFS) lands in Angeles National Forest (ANF).

Prior to taking action to approve SCE's application for a CPCN for the Project, the CPUC must determine that the 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 220 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 Investor-Owned Utilities (IOUs) operating within California. As a crucial step in fulfilling this purpose, the CPUC must explore possibilities, such as TRTP, for the removal of constraints on the transmission of electricity from its point of generation to its point of use. Furthermore, the CPUC must attempt to further the implementation of other State policies and programs related to power generation and transmission.

As the federal Lead Agency, the USDA Forest Service must respond to SCE's special use application to construct, maintain, and operate the Project/Action on NFS lands through the ANF through the 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. The USDA 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 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.

1.4 Issues Identified During Scoping

A series of scoping meetings were conducted with the public and government agencies during the scoping period for the EIR/EIS (August-October 2007) to gather information on issues and concerns related to SCE's proposed Project. In addition, written comments were sent by agencies and the public identifying issues and concerns. All of this input is summarized in the Scoping Report and Comment Analysis published by the CPUC and Forest Service in November 2007. Relevant issues related to Geology raised during the scoping process are summarized in Table 1-2 below, which explains how those issues are addressed in this Specialist Report.

Table 1-2. Issues Raised in Scoping: Geology, Soils, and Paleontology

Significant Issues	How Addressed in this Report
Comments were received regarding concerns that natural disasters could cause towers to fall (address soil stability and/or seismic fault proximity).	The location and impact of landslide prone areas, potentially unstable slopes, active faults, and seismic shaking are discussed. Mitigation Measure G-3 requires geological surveys of tower locations to identify landslide or unstable slopes at tower sites. Mitigation Measure G-4 requires identification of areas of potential surface rupture along active faults. Mitigation Measure G-5a requires geotechnical studies to develop seismic design parameters for towers and substations. Mitigation Measure G-5b requires geotechnical studies to identify site-specific liquefaction potential and develop recommendations for design to protect against adverse impacts to transmission line towers.
Comments were received regarding necessity of liquefaction studies/analysis, including recent research data on local faults such as the Whittier, Puente Hills Blind Thrust, and the Elysian Park Blind Thrust.	The location and impact of liquefaction susceptible areas are discussed. Mitigation Measure G-5b requires geotechnical studies to identify site-specific liquefaction potential and develop recommendations for design to protect against adverse impacts to transmission line towers.

Note: Not all concerns raised during scoping were determined to represent significant issues and, therefore, may not be addressed in this analysis. In addition, some issues identified may not be appropriately addressed as part of the EIR/EIS process and, therefore, are not included in the analysis. See the Scoping Report and Comment Analysis (November 2007), which identified significant issues from among the scoping comments.